Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

_____ _____

Jacob Isaac Ricks Date

The Politics of Participation:
Irrigation Associations in Southeast Asia

By

Jacob Isaac Ricks
Doctor of Philosophy

Political Science

_____
Richard F. Doner
Advisor

_____
Jennifer Gandhi
Committee Member

_____
Peter Little
Committee Member

_____
Tracy Yandle
Committee Member

Accepted:

_____
Lisa A. Tedesco, Ph.D.
Dean of the James T. Laney School of Graduate Studies

_____
Date

The Politics of Participation:
Irrigation Associations in Southeast Asia

By

Jacob Isaac Ricks
M.A., Northern Illinois University, 2007
B.A., Utah State University, 2005

Advisor: Richard F. Doner, Ph.D.

An abstract of
A dissertation submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in Political Science
2013

Abstract

The Politics of Participation:
Irrigation Associations in Southeast Asia
By Jacob Isaac Ricks

Institutions for collective action are vital to accomplishing a variety of difficult developmental tasks, including irrigation management. For decades experts have argued collective action institutions for farmer participation, called water user organizations, are essential for improving water resource management. Such organizations increase the efficiency and efficacy of irrigation. In order to function, though, they require a favorable policy framework. Despite this knowledge, very few countries have been able to develop the recipe of policies necessary for participatory irrigation management. Why? I propose that the observed variation can be explained by the political environment. In this dissertation I advance a theory based on the preferences of three sets of policy actors: politicians, top-level bureaucrats, and street-level bureaucrats. I argue that politicians will only expend the resources necessary to develop institutional capacity when they are faced with significant political vulnerability paired with a low degree of policy influence from bureaucrats. I test my theoretical expectations by conducting a controlled comparison of participatory irrigation management policies and their implementation across four Asian countries: Taiwan, the Philippines, Indonesia, and Thailand. Postulating that the theory should have a similar effect at the sub-national level, I also conducted comparative case studies of seven water user organizations in Indonesia and nine water user organizations in Thailand. I found that the national case comparisons supported my argument. In contrast, my sub-national comparisons show that, without a national policy framework favorable to participatory irrigation management, the success of water user organizations depends less on political vulnerability than on the attitudes and actions of street-level bureaucrats. These actions are largely determined by the incentive structures within the irrigation agency, but they may also be influenced by personal relationships with the communities in which they serve. Thus water user organizations are best able to emerge in states where a favorable policy framework developed due to the presence of political vulnerability and a lack of bureaucratic policy control. When such conditions do not exist, though, water user organizations may still emerge, contingent upon the incentives of street-level bureaucrats.

The Politics of Participation:
Irrigation Associations in Southeast Asia

By

Jacob Isaac Ricks
M.A., Northern Illinois University, 2007
B.A., Utah State University, 2005

Advisor: Richard F. Doner, Ph.D.

A dissertation submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in Political Science
2013

Acknowledgments

Writing this dissertation has been a long and arduous process spread across three countries on two continents. Multiple organizations and individuals have assisted in this work, from farmers to bureaucrats to politicians to researchers, and I feel as though my thanks will never be adequate. Nevertheless, I wish to note a few specific groups and the individuals within them.

Initially, my family deserves thanks. My father taught me how to irrigate and how to be a farmer, which has wonderful application in pursuing a Ph.D. Blood, sweat, and tears go into every crop he grows. The same could be said of my dissertation. My mother taught me to love reading and aim for higher education. Both my grandmothers assisted in this effort; first by reading to me, then reading with me, and finally supporting my habit by buying me books. Magen, my sister, taught me to be determined and strong when achieving a goal. Trevor, my brother, taught me to have fun and that a smile or a well-timed joke will get you farther in life than stating facts. It's a lesson I am still learning.

Wonderful teachers have guided me in this effort. Foremost among these has been Rick Doner. His direction and criticism shaped my thinking and turned me from an academic wannabe into something more akin to a researcher. I'll be forever grateful for his time. Jennifer Gandhi, Peter Little, and Tracy Yandle all suffered through repeated drafts of the project with patience while providing important input. Eric Reinhardt, Jeff Staton, Thomas Remington, Dan Reiter, Michael Giles, and Michael Owens all

contributed to my scholarly development as well. During my master's degree, Jim Ockey, Dwight King, and Danny Unger shaped my thinking, especially in regard to the study of Southeast Asia. They also directed me toward a Ph.D. and Emory University. M. Ladd Thomas inspired me to think more about bureaucracy.

Other researchers have also been important in shaping my work. Diana Suhardiman, who would have been on my dissertation committee if not for a number of administrative hurdles, provided excellent commentary on some of the chapters found here. Ben Ross Schneider, Andrew Schrank, Douglas Vermillion, and Bryan Bruns all gave me important direction and correction in some of my early efforts. Colleagues at Emory have also been vital to my professional development. While I can't list everyone, I want to make particular mention of Amy Liu, Nigel Lo, Nicole Baerg, Ryan Tans, and Andrew Kirkpatrick. Thanks!

I've been fortunate enough to always find the necessary funding for my research and training. My fieldwork was supported through a Fulbright IIE Student Award administered through the American Indonesian Exchange Foundation, AMINEF. I also received support from the Social Science Research Council Dissertation Proposal Development Fellowship funded by the Andrew W. Mellon Foundation. I benefited from language training provided through the Critical Language Scholarship of the US State Department, the Summer Studies program of the United States – Indonesia Society, and, while at NIU, a Foreign Language and Area Studies Scholarship from the US Department of Education. I am also grateful to Emory for my graduate school fellowship as well as Professional Development Support funds, which have been vital to filling in the gaps that external grants did not cover.

In Indonesia I was fortunate enough to be associated with the Faculty of Agriculture Technology at Gajah Mada University in Yogyakarta. I owe special thanks to Professor Sigit Supadmo Arif for hosting me there. Thanks also go to Professor Lilik Sutiarso. Pak Sigit's students and staff, especially Abi Prabowo, were incredibly welcoming and helpful. I owe them all a debt of gratitude. If any of them read this, *terima kasih banyak*. I am also grateful to The State Ministry of Research and Technology (RISTEK) for granting me permission to conduct my research.

During my time in Bangkok, the Thailand Development Research Institute provided me an academic home. My appreciation goes to Dr. Ammar Siamwalla and Dr. Nipon Poapongsakorn who hosted me there as well as the other researchers and staff at TDRI. I am also grateful to Dr. Punchada Srivivunnabood for being a fast friend to talk with about Thai politics, even when we disagree. Thanks also go to the National Research Council of Thailand, which facilitated my research while in Thailand.

Friends in both Indonesia and Thailand were there to help me through those darker moments when the project was a little slow and celebrate with me when it went well. I can't name them all here, but I will always remember and be grateful for those who made me feel at home. I must mention both Yodim Kusuma and Taufik Nur, who were wonderful language tutors, research assistants, and, most importantly, dear friends.

I also owe special gratitude to the Department of Public Works in Indonesia, especially at the provincial and district level in Yogyakarta Special Administrative Region. The Indonesian officials I spoke with were always willing to share their knowledge and experience. The Royal Irrigation Department in Thailand, especially the Office of Public Participation Promotion also was extremely accommodating. When I

began this project, I could have never imagined that I would find civil servants so sympathetic to my research. Irrigation officials invited me into their offices and in some cases their homes to discuss their work in a frank and intimate fashion. Their hospitality went far beyond my expectations. Although I cannot name all of those who showed me numerous kindnesses, of special note are Sarayuth Imcai, Manas Kamnerdmanee, and Pak Bambang.

I wish to thank farmers. I never imagined that this potato farmer's son would travel to the opposite end of the earth to speak with rice farmers in Thailand and Indonesia. Somewhat surprisingly, their situations reflected those I experienced growing up, and we spoke the same language although it was in different tongues. Farmers around the world produce the food we eat while those of us in the cities continue on our daily lives generally unaware of the hardships faced by the farmer. It is my fondest hope that farmers around the world are able to ride rising economic tides and enjoy every benefit provided to all other members of society. I am a firm believer in the sentiment of Booker T. Washington, "No race can prosper till it learns that there is as much dignity in tilling a field as in writing a poem."

Finally, I thank God for the journey.

A Note on Language and Names

In contrast to Western countries, both Thailand and Indonesia are relatively new to the use of last names.

The Thai convention is to use first names. Following that custom, when I cite a Thai author, I use their first name rather than their last name. Thai authors are also listed

by their first name in the bibliography. With transliteration of proper nouns, I have used the commonly accepted spellings as found on maps and other documents. When referencing individual quotes, I have written words according to the closest approximation of pronunciation with some reference to the Haas system of transcription, although without tone marks.

Indonesian last names generally do not signify lineage. A child may bear a different last name than either parent. In many cases Indonesians do not have a last name, thus they are cited by their only name. Otherwise, the citation style follows Western custom of last name, first name.

Table of Contents

Figures and Tables

Figures

Tables

Chapter 1

Introduction

The Research Question

Reeling from the economic troubles leading to the fall of Suharto and facing pressure from the World Bank, in 1999 the Indonesian government adopted a series of participatory irrigation management policies. They were meant to increase farmer decision-making and involvement in the development, operation, and management of water resources in cooperation with the newly-created Ministry of Settlement and Regional Development. These reforms quickly stalled and were largely overturned by the creation of the 2004 Water Law, which re-allocated authority to the central irrigation bureaucracy.[1] Government agencies again took control of the majority of responsibility over water management. The resulting farmer participation is sporadic.

Consequently, we observe situations like that of the Mataram Canal, a primary feeder canal in Indonesia's Yogyakarta Special Administrative Region. Farmers have removed levers and screws necessary to close water extraction points (called headgates). At points the canal is clogged by a forest of reeds and refuse that choke the flow of water and make irrigation difficult, if not impossible. Only a trickle of water flows into the canal's final destination, the Opak River. The Department of Public Works lacks both the will and resources to monitor, manage, and enforce rules for water allocation, resulting in frequent water thievery and shortages, as well as a lack of infrastructure maintenance.

[1] Suhardirman 2008

In contrast, Taiwan's irrigation arrangements effectively involve farmers nation-wide in the complex process of evaluating, managing, monitoring, and allocating water resources. The country's seventeen para-statal Irrigation Associations maintain a bureaucratic hierarchy, but the structure ensures that officials are responsive to farmer needs. They rely on farmer contributions of time and money to clean canals, deal with failing dykes, determine water distribution schedules, and manage allocation. Farmers are organized into Irrigation Groups, which serve as arenas for collective action and water distribution. These organizations are very effective despite the low level of social capital traditionally found among Taiwanese farmers.[2] Through the government's participatory policies, hearkening back to the 1950s, Taiwan enjoys one of the most effective and efficient water resource management regimes in the world.

These contrasting examples are puzzling. We know that an active farmer-irrigation agency relationship, characterized by farmer participation in irrigation management, is key to the efficacious governance of water resources.[3] Even so, relatively few states, such as Taiwan, have been successful at incorporating farmer participation in irrigation management. Others, like Indonesia, repeatedly flounder in their policy efforts to encourage water user participation. The failure comes despite extensive promotion, examples, training, and monetary support from both governments and international agencies.[4] *Why?*

---

[2] Lam 1996. For recent changes see Lam 2001; 2006.

[3] Neef 2009; Garces-Restrepo, Vermillion, and Munoz 2007; Vermillion 1997; Wade 1988.

[4] International organizations such as the World Bank and the United Nations have strong commitments to promote participatory water resource management (UN 1992; World Bank 1993). According to Ammar (2001), ten percent of all World Bank and Asia Development Bank loans go to irrigation projects, most of which include requirements for participatory policies.

Irrigation management can be seen as an extensive collective action problem[5] characterized by high information, monitoring, and enforcement costs among actors with strong incentives to cheat. Enforcing rules and monitoring irrigation systems without farmer cooperation would require massive government investment.[6] Institutions, or the rules and organizations which structure actor behavior, like Taiwan's Irrigation Associations, are key to reducing costs and creating incentives for cooperation.[7] Institutional capacity determines the ability of state actors (bureaucrats) and service recipients (farmers) to collaborate and mutually manage a limited resource. But these institutions do not emerge out of a vacuum, they are born of political context.[8] Thus my research question: *Under what political conditions will a state encourage effective institutions, such as water user organizations, for farmer-agency collaboration?*

This question is only a subset of a broader question: *Why are some state actors able to effectively create institutions to accomplish difficult developmental tasks while others fail?* This question reaches beyond the empirical context of irrigation into other realms including business development and promotion, resource management, and education. Effective formal and informal institutions shaping the interaction between state actors and service recipients are necessary for a host of developmental tasks.[9]

Thus my dependent variable is the emergence of institutions for farmer participation in the process of irrigation management or what international agencies, like

---

5 Olson 1965.
6 Wade 1988.
7 Ostrom 1992; North 1990. Recent research indicates that the lack of attention to institution development has been one of the major impediments to Irrigation Management Transfer and PIM. See Garces-Restrepo, Vermillion, and Munoz 2007; Vermillion 1997.
8 Doner, Ritchie, and Slater 2005.
9 Pritchett and Woolcock 2004; Haggard 1990; Amsden 2001.

the World Bank, refer to as participatory irrigation management (PIM). More specifically, I want to explain the development of organizations for farmer-agency relationships, e.g. water user organizations (WUO), that are effective in encouraging farmer participation in water resource management. Such institutions depend on a policy framework of organizational and bureaucratic rules promoting interaction between irrigation agency officials and farmers along with less formal interactions that may be encouraged by the bureaucratic structure.

Following an extensive literature (reviewed below), I argue that these institutions emerge according to the incentive structure of policy actors, including both politicians and bureaucrats.[10] Under normal conditions, neither politicians nor bureaucrats have incentives to spend time and resources on policy for developing participatory institutions. Such institutions entail high information, transaction, monitoring, and enforcement costs. Only when politicians face significant *political vulnerability,* or the imminent threat of losing office due to their action on a specific policy arena (irrigation), will they take on the difficult task of creating institutional capacity at the national level. These efforts, to be effective, must include the development of a legal framework for PIM accompanied by bureaucratic reforms to change the incentive structure of the irrigation officials who will implement the policy.[11]

[10] Farmers, in my theory, are generally considered as recipients of irrigation policy rather than policy actors. This is due to an extensive history in developing states of farmers largely being treated as service recipients by policy makers and public servants rather than partners in the policy process, which has resulted in relatively little farmer participation in the policy process.

[11] I wish to be clear that when I use the term bureaucratic reform, I am referring to reforms geared toward developing a new incentive structure in the bureaucracy by turning it toward service provision and professionalism rather than rent-seeking activities and personal economic pursuits. In essence these are steps toward a Weberian-style bureaucracy. Extreme reform, such as dismantling an agency or creating a new one, may be counter productive. Even in the most corrupt and inefficient agencies, there is a wealth of both technical and practical knowledge about how things work. Dramatic reforms may lead to inefficiency and policy failure despite good intentions, such as when the Nixon Administration created

Political vulnerability alone is insufficient, though. If officials in the irrigation agency are able to control the policy-making process due to either political or institutional considerations, they will eviscerate policies contrary to their interests. Following Heredia and Schnieder, I refer to such a situation as *bureaucratic fusion.*[12] Thus the presence of political vulnerability combined with the absence of bureaucratic fusion is necessary for the development of national institutions for PIM.

Figure 1.1 represents this theoretical approach. Under a high degree of political vulnerability, policy makers develop a desire to create effective participatory institutions.[13] In order to do so, they must first develop policies and create incentives for the bureaucrats to implement them through some degree of reform. Bureaucracies may resist such reforms and will derail the changes if they exercise a great deal of influence over the policy process.

In states where successful national institutions are not present, though, pockets of participation may still exist. I argue that this local variation can be explained by applying the concepts of political vulnerability and bureaucratic fusion to the local level. Local pressures, such as political competition or budget constraints, mediate the effects of national policies and shape the incentives of local officials and politicians to promote institutional development.[14]

---

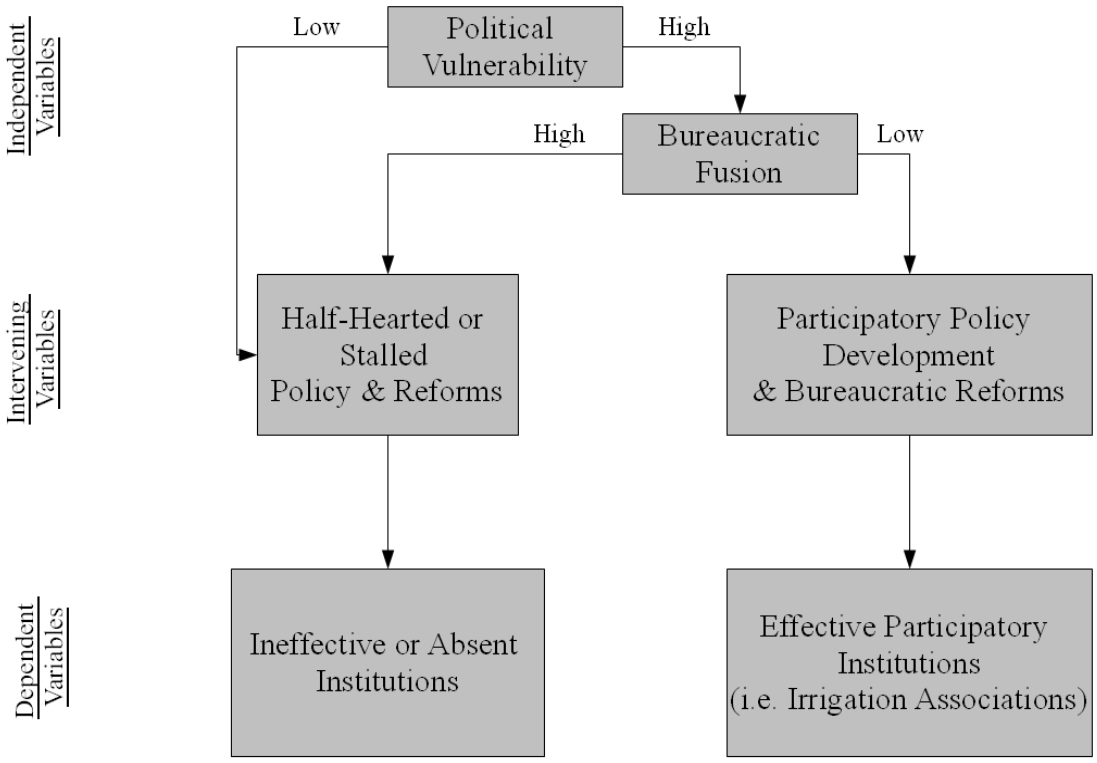
the Drug Enforcement Agency in 1973. See Rachal 1982.

12 Heredia and Schneider 2003, 15. In Chapter Two I include a more detailed definition of both political vulnerability and bureaucratic fusion.

13 Political vulnerability affects both democratic and authoritarian regimes. This is explained in more detail later.

14 Tendler 1997; Careaga and Weingast 2001.

Figure 1.1: Theory of Institution Creation



Thus I put forth a two-level explanation for the development of efficacious water user organizations. First, national institutional reforms, such as changes to bureaucratic rules and incentive structures, must be developed which are consistent with PIM in order for WUO to thrive. Second, even when such national reforms do not happen, a local political context may emerge that can encourage successful water user organizations.

My dissertation investigates the development of irrigation associations utilizing this theoretical approach and provides empirical evidence at both the local and national level regarding the politics behind institution-building. Chapter Two elaborates my theory and research design while later chapters turn to my empirical findings.

The remainder of this chapter is designed to accomplish two tasks. First, I review

the core substantive issue of my dissertation – irrigation management. I then turn to a review of the political science literature relevant to my research question.

Irrigation Supply and Demand

The question of water allocation and distribution is inherently political, despite the fact that most literature on the subject treats it as primarily a technical problem.[15] These technical treatments of irrigation often overlook the fact that canals are distributional devices. They operate without a market, instead relying on administrative decisions often made by government officials. Water users' access to these gate keepers determines their access to the resource.[16] As long as water is plentiful, it holds little value, and efficient management is not essential to crop production. In such situations, the lack of attention to the politics of decision-making might be understandable.

Unfortunately, even in relatively wet countries, water resources are being strained. Urbanization and climate changes have increased demands on water; those demands are expected to increase over the coming years.[17]

Despite these demands, roughly two-thirds of the world's supply of fresh water remains devoted to agriculture and thus irrigation; that proportion increases to over 90 percent in some developing countries. Figure 1.2 provides some measure of this disparity between poor countries and wealthy countries.

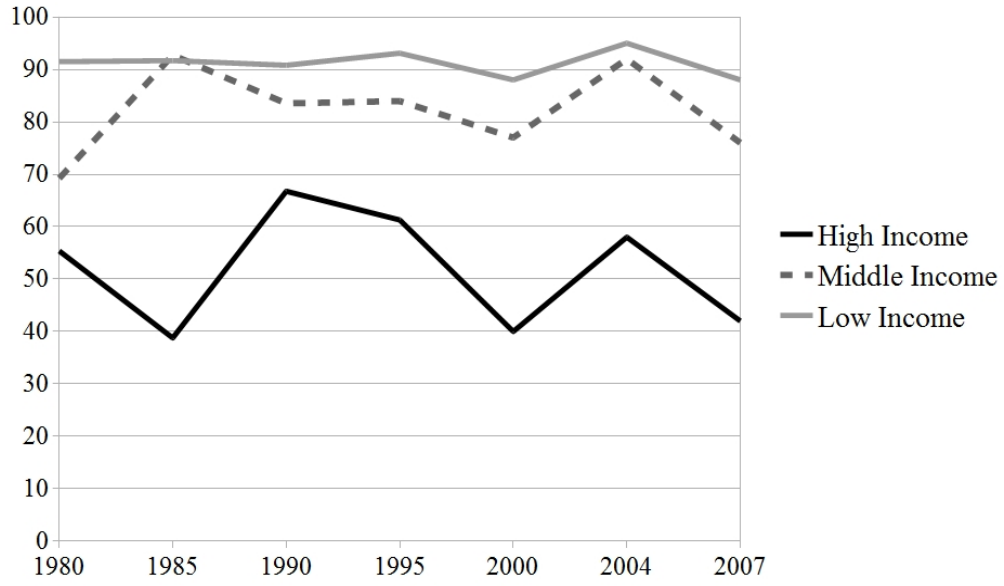
---

[15] Mollinga and Bolding (2004, 4) note that "the word 'politics' is virtually absent in the formal policy discourse on irrigation reform."

[16] Wade 1975a.

[17] Postel 2001.

Figure 1.2: Annual Freshwater Withdrawls for Agriculture (percent of total) by Country Income Groups



Data Source: World Bank World Development Indicators

For a more obvious contrast, we can compare individual countries. As seen in Table 1.1, the United States devotes less than half of its freshwater resources to agriculture. South Korea, another country in the high income group, applies just over 60 percent of its freshwater withdrawals for agriculture. This disparity can be understood in light of Korea's reliance on rice, a water-intensive crop. In contrast are four countries found in the middle income group. Mexico, a relatively water-scarce country, uses about three-quarters of its water for agriculture, while the water-rich, rice-intensive countries of Indonesia, the Philippines, and Thailand all use more of their water for agriculture. Thailand, despite having relatively high precipitation levels and a relatively higher level of development, devotes over 90 percent of its freshwater withdrawals to agriculture.

Table 1.1: 2007 Freshwater Withdrawals by Sector of Selected Countries

	Agriculture	Industry	Domestic
United States	40.22	46.11	13.68
South Korea	62.03	11.97	25.99
Mexico	76.72	9.15	14.14
Indonesia	81.87	6.53	11.59
The Philippines	83.13	9.45	7.41
Thailand	90.37	4.85	4.78

Source: World Bank Development Indicators

One might argue that the distribution of water resources is partly due to the proportional importance of agriculture to the economy. This hypothesis can be statistically tested. Using linear regression analysis on national data from 2007, I demonstrate a lack of correlation between the percentage of GDP derived from agriculture and the percent of freshwater withdrawals used for agriculture (Table 1.2).[18] I include control variables for rainfall (average precipitation) and the amount of land devoted to rice production, which logically we should expect to have a negative and positive effect on the amount of water devoted to irrigation, respectively. As they do.[19] Another variable that does appear to matter is the level of economic development,

[18] In other words, the statistical relationship between the two variables cannot be determined to be greater than 0. Unfortunately freshwater withdrawals have only recently been reported by the World Bank, with no data available for many countries prior to 2007. The World Bank WDI code book also cautions against drawing many inferences from the cross-national data on freshwater withdrawals.

[19] The effect of the proportion of arable land devoted to rice production may be exaggerated. The FAO reports only the number of hectares of rice harvested, which, due to multiple seasons per year, can actually be higher than the total hectares of arable land, as in the case of Vietnam. Using this number alone would be problematic, as variation in land area would not be accounted for. Instead I standardized the measure by dividing the number of hectares of rice harvested by the total hectares of arable land and then converting that into a percentage. Unfortunately, I was unable to locate a data source which identified total hectares devoted to rice that did not count double- or triple-cropping. Despite the imperfections in the measure, it does inform us of which countries should devote more water to agriculture due to the demands of rice production.

measured by GDP per capita, which we knew from Figure 1.2. The higher a country's GDP, the less water it uses for agriculture. Thailand, though, is surprising due to its status as an upper-middle income country ($2,563 GDP per capita), yet its water use for agriculture is similar to that of a low income country, despite its relative abundance of rainfall with an average annual rainfall of about 1,600 millimeters of rain per year. On the other hand, the Philippines and Indonesia, much poorer countries (GDP per capita of $1,283 and $1,003 respectively), have water allotments for agriculture that are closer to 80 percent, even though much of their agriculture is based on rice, like Thailand. Other factors must be at work.

Table 1.2: Regression Results of 2007 Agricultural Water Withdrawals predicted by Value Added of Agriculture for GDP

Constant	66.204** (12.57)
Agriculture, value added (% GDP)	0.338 (1.70)
GDP per capita (constant 2000 $)	-0.001** (-4.15)
Average Precipitation (depth in mm)	-0.014** (-4.25)
Percent of Arable Land Devoted to Rice Production	0.638** (5.37)
N: 142 countries T values in parentheses ** = statistically significant at the .01 level	
Source: World Bank World Development Indicators, FAO Statistics Database All data is from 2007	

We also cannot simply assume that the demand for water from industry does not exist in countries that devote the vast majority of their water to irrigation. On the

contrary, Bangkok is currently facing problems of land subsidence due to industry and the city pumping water from the aquifer because surface water is not an easily available option.[20] Conflict between industry and agriculture over water resources has a long history, with the Thai government generally favoring agriculture. In 2008 the Federation of Thai Industries created an Institute for Industrial Water Resources completely devoted to lobbying for industrial access to water resources.[21] This anecdote illustrates the fact that cities and industry do need water, despite distribution favoring irrigation. Requirements for industrial water use in Asian cities are expected to increase by as much as 700 percent in the near future.[22]

Increasing urbanization and climate change are also shifting the structure of water resource demands. While for generations, the vast majority of the world's population had abundant access to water, that is changing. The number of people who need access to water has doubled to 6 billion since 1950, a feat that may be repeated by 2100. With over half the world's population now found in cities, water demands in urban areas have expanded and changed.[23] Climate change is also altering the patterns of rainfall and evaporation around the world.[24] No longer may countries devote all but a small portion of their water resources to agriculture.

Increasing demands for water come at the same time as an increased demand for

---

[20] Some areas are seeing subsidence at rates of 10-14 cm per year. See Molle 2005.

[21] Interview, Director of Institute of Industrial Water Resource Supplies, The Federation of Thai Industries, Bangkok, June 18, 2009.

[22] Vermillion, Ostrom, and Yoder 2005. For a more specific example, the government of Jakarta estimates that its city will require 44 percent more clean water in 2015 than 2011 requirements. The Jakarta Post. "Water Demand to Increase by 44% in the Next Four Years." *The Jakarta Post.* October 11, 2011.

[23] Charboneau, Louis. February 26, 2008. "Half of he World to Live in Cities by the End of '08." Reuters News Service. Accessed April 4, 2013, http://www.reuters.com/article/idUSN2635607520080227.

[24] See the Climate Institute's work on water. Accessible at http://climate.org/topics/water.html.

food. 2008 broke records as food prices soared to all-time-highs. Although prices moderated somewhat thereafter, they are still above those experienced in 2006. The Food and Agriculture Organization of the United Nations estimates that in order to feed the world by 2050, investment in agriculture needs to reach almost US $120 billion annually.[25] The efficiency of irrigation needs to increase, or as USAID says, we need to see "more crop per drop."[26]

All this suggests that in countries where an overwhelming majority of freshwater withdrawals go to agriculture such as Thailand, a resource allocation failure exists. Industrial and urban demand are present, yet water is still provided at such a low cost to agriculture that efficient management has not emerged. Thus, one of the most vital resources for production is improperly allocated. We could term this a market failure, wherein the free market has failed to distribute resources efficiently. This, though, would be a misnomer. Because of the nature of water resources, the distributional issue lies mostly at the feet of the state, which means the issue may be more appropriately termed a "government failure."[27]

Irrigation and Agency Performance

Re-aligning the distribution of water resources for economic development is difficult, and attaining irrigation efficiency has been relatively unsuccessful in most developing countries. I argue that disproportionate distribution of water to agriculture in these countries can be largely laid at the feet of poor irrigation management.[28] One World

---

[25] FAO Policy Brief, "Harvesting Agriculture's Multiple Benefits: Mitigation, Adaptation, Development and Food Security." Accessed April 4, 2013, ftp:/ftp.fao.org/docrep/fao/012/ak914e/ak914e00.pdf.
[26] See also Rosegrant and Ringler 2000.
[27] McKean 1965.
[28] Saleth and Dinar 2004.

Bank report on Southeast Asia stated, "with few exceptions, [operations and maintenance] performance by both agencies and irrigators on the large, government-operated, gravity-fed irrigation schemes in Southeast Asia is dismal."[29]

Unfortunately, irrigation management is one of the most difficult activities that states can engage in. This is due to the large numbers of transactions and local decisions that must be made in water distribution.[30] Service recipients need to be actively engaged in the process for it to function effectively, which some scholars refer to as co-production.[31] In other words, co-production means that the government agencies charged with providing a service are required to rely on the community they serve to help produce the good or service.[32]

Obstacles to co-production in irrigation are abundant. Managing irrigation basins large enough to encourage cash cropping and the expansion of farm production requires intensive information sharing between farmers and officials coupled with collective action among farmers who have strong incentives to free-ride the system.[33] This requires a great deal of flexibility, information sharing, and intensive contact with farmers. Officials must be able to gather and process data ranging from rain fall amounts to crop cycles to farmer demands to household and urban consumption, not to mention environmental concerns. Based on this data, decisions must be made regarding how much

---

[29] Rice 1997. Rice then went on to argue that the situation was not as dire as the international aid community often paints it, yet his research still indicated a number of shortcomings in water management.

[30] Pritchett and Woolcock (2004) argue that tasks which are both information and transaction intensive, such as irrigation, are the most difficult for central agencies.

[31] Evans 1997. See also Lam 1996; Whitaker 1980.

[32] An example includes the development of modular production in the apparel industry in the Dominican Republic. Schrank 2011.

[33] See Olson 1965.

water can be allocated per farmer. The system must be able to respond quickly as water supplies and demands change throughout the season. Implementing distribution decisions requires that officials be able to inform farmers regarding their water allotment then implement and monitor the water distribution. This is difficult because farmers have strong incentives to maximize their individual access to water. Even in states with high government capacity, "most of the observance of rules has to be more voluntary, because the cost of enforcement when large numbers of the population comply involuntarily (through a calculus of evasion and punishment) is likely to be prohibitively high."[34] The vast amount of information and number of transactions and local decisions necessary for effective irrigation make it a difficult issue for centralized state structures to manage.

Policy makers and researchers have long known of these difficulties. Recognizing that farmer participation was necessary for states to solve these problems, researchers and policy experts have promoted a policy package under the title Participatory Irrigation Management (PIM).[35]

Before moving on, it is important to note that state-driven participatory approaches are often guided by the idea that through participation, the state will be able to reduce costs. This has been a resounding chorus among proponents of community-based natural resource management policies ranging from water to forests. Such policies often falter in their participatory goals, as state actors use the "participation" discourse to drive both personal and state objectives and manipulate local people rather than

---

[34] Wade 1988, 489.

[35] Another series of programs includes Irrigation Management Transfer (IMT), which is different than PIM. IMT includes full transfer of authority over canals and water management to farmers. Garces-Restrepo, Vermillion, and Munoz (2007, 4) state, "while the IMT concept intends to replace the role of the government, PIM seeks to strengthen the relationship between water users and government by adding farmer participation to government management."

encourage actual involvement from communities.[36] As seen in the chapters below, this occurs in some of my cases, to a degree. Even with this criticism, we should acknowledge that such outcomes are often the result of the political conditions under which a policy is implemented; my theory provides some understanding of why such outcomes occur. We should also recognize that despite this criticism, farmer participation in irrigation management, if conducted under a favorable institutional arrangement, can vastly improve water resource management.

A Brief History of PIM Policies

The push for participation in irrigation management is a fairly recent trend, only appearing in full force in the 1980s and 1990s. Irrigation policies have roughly reflected the ideas presented in development economics, i.e. a period of first-generation development economists (1950-1975) who promoted government investment in infrastructure, or physical capital, to promote development with the government being a major factor in promoting economic growth. This was followed by a second generation (1975-2000) who were influenced by neoclassical economics, focusing on individual incentives and diminished government control.[37]

In irrigation the first generation of development economics was reflected in a focus on the promotion of building dams and canals with government control of water, in natural continuation of earlier policies. At the turn of the 20th century, state actors became heavily involved in seizing irrigation management from individuals and farmer groups.

---

[36] See Li 2002; 2007; Larson 2005.

[37] Meier 2001. See also Lindauer and Pritchett 2002.
For an alternative categorization of the World Bank's irrigation policies see Jones 1995. Despite using three categories, though, Jones' analysis does not contradict my own.

As irrigation bureaucracies were established and grew, often under colonial authority,[38] they discounted farmer knowledge and participation in favor of massive irrigation projects and government control. This constituted a “hydraulic mission” or a belief that the state should intervene to build the infrastructure (dams and canals) necessary to make use of all water resources for production. This belief went on to characterize the mindset of irrigation bureaucracies across much of the world.[39]

International agencies and foreign donors, like the World Bank, saw the growth of irrigation infrastructure as vital to agricultural development and expansion. As such, money flowed into irrigation bureaucracies in developing countries to support the building of dams and digging of canals. State-controlled irrigation was generally the rule until the mid-1970s.

At that time the World Bank's stance on irrigation changed just as the perspective in development economics shifted. Decades of irrigation projects had failed to yield the expected results. The water projects were not paying for themselves, and money for infrastructure development didn't guarantee that locals could maintain and operate the results of the projects. Nor was there much evidence that the infrastructure actually met the needs of farmers.

Beginning slowly in the mid-1970s, international agencies and Western governments began to promote decentralized control over water resources with a larger role for farmers and farmer groups in operation and maintenance. The set of policies were referred to as Participatory Irrigation Management, inclusive of Irrigation Management

---

[38] Ertsen 2006.
[39] Wester, Rap, and Vargas-Velazquez 2009.

Transfer (IMT). These policies were meant to tie responsibility and authority over water resources more closely to the interests of farmers, either by transferring water ownership or responsibility to farmer groups.[40]

By the early 1990s, the push behind PIM was in full swing. At the 1992 Earth Summit in Rio de Janiero, attendees signed a document declaring participation as necessary for sustainable development.[41] The Dublin Water conference also declared that water management should be participatory.[42] While these symbolic meetings did not directly affect policy, they reflected a larger turn in the policy community toward participation.

After approximately two decades of PIM policy promotion, though, practitioners and researchers have realized that the promise of such policies has fallen short. Infrastructure projects often became the focus of corruption and graft;[43] attempts at water pricing turned out to be less efficacious than promised because of the difficulty in tying farm outputs to the appropriate water pricing mechanisms;[44] and the development of water user organizations by the state has rarely resulted in the cooperation observed in indigenous groups.[45]

We have learned that state officials must also be aware of the capacity of farmer groups to manage the irrigation infrastructure provided. Merely building physical resources does not guarantee that farmers know how to manage them. Despite training,

---

40 See footnote 35 above for differentiation. Garces-Restrepo, Vermillion, and Munoz 2007.
41 United Nations 1992.
42 "Dublin Statement on Water and Sustainable Development." January, 1992. International Conference on Water and the Environment. Dublin, Ireland. Accessed April 4, 2013. http://www.gdrc.org/uem/water/dublin-statement.html.
43 Bruns 1991; Li 2007.
44 Molle and Berkoff 2007.
45 Parthasarathy and Pathak 2003; Molle, Nittaya, and Savakon 2002.

resources, and promotion, efficient and effective irrigation management repeatedly eludes state control.[46]

Beyond the difficulty of the task, most agencies charged with responsibility over water resources face a number of perverse incentives. The average civil servant in an irrigation department is a relatively well-educated civil or irrigation engineer. Most of his or her training has to do with building effective infrastructure, including canal systems and dams. Such training turns civil servants away from the day-to-day socio-technical process of irrigating.

Beyond the effect of training, career incentives combine to deter civil servants away from irrigation operations and maintenance. The most attractive jobs in the irrigation agency are either involved in the planning and building of infrastructure or working at the central bureaucracy.[47] Infrastructure projects, such as dams, involve massive investments with easily visible results. Such projects are where money flows, promotions are found, and learned skills are put into practice. This is reflected in the fact that the vast majority of irrigation agencies still focus on engineering, bureaucratic control, and infrastructure solutions rather than issues of water efficiency and allocation.[48] In conjunction, officials in irrigation agencies often fear that PIM strategies will diminish the number of jobs available, the status of the agency, and the agency's budget.[49]

Adding to these perverse incentives, irrigation agencies are in as much or more danger of collusion with service recipients as any other bureaucracy. With officials acting as gate keepers to a vital and limited resource, opportunities for corruption or side

[46] See also Bruns' work on the interaction between farmers and irrigation agencies. Bruns 2008.
[47] Lam 1998.
[48] Saleth and Dinar 2004.
[49] Garces-Restrepo, Vermillion, and Munoz 2007.

payments abound for those water users with greater access to resources.[50] Thus water distribution favors vested interests rather than efficiency.

The lack of incentives to focus on operations and maintenance, combined with the difficulty of the task, create an environment wherein it should be no surprise that irrigation management suffers from poor performance. Yet, not all systems are failures. A precious few, such as the Irrigation Associations in Taiwan, are successful at promoting farmer participation in management of water resources.[51]

Building upon the work of Ostrom, I argue that successful implementation of PIM depends on the institutions which structure the incentives of civil servants and farmers.[52] But these institutions do not emerge from a vacuum. They are the product of political contexts and the relationships between bureaucrats and politicians.

Institutions and Incentives

Institutions are the formal or informal rules and organizations which structure actor behavior. They determine who actors are and the options they pursue. They also provide information and determine which issues are considered. Institutions affect the pay-offs actors face for their actions, thus channeling activities in certain directions.[53]

To clarify, one might think of institutions as rules in a basketball game. Boundary lines painted on the floor have no physical force by which to encourage players to remain in-bounds, yet the punishment of losing possession if one steps outside the lines while holding or dribbling the ball generally provides sufficient incentive for a player to remain

---

50 Wade 1975a.

51 The reformation of the Mexican bureaucracy is also widely considered successful, at least in the policy network. Rap 2006.

52 Ostrom 1992. See also Saleth and Dinar 2004. See also Mansbridge's (2010) commentary on Ostrom's work and the role of government in common pool resource management.

53 North 1990.

on the court. Similarly, regulations about fouling, shooting, and dribbling limit player behavior. Without these rules and their accompanying norms of sportsmanship, a game of basketball would be very different.

Similar to rules in a game, institutions and changes to them shift the costs and benefits actors face, thus creating new incentives to act in different ways. Well-designed institutions can create incentives for actors to engage in collective action and accomplish difficult governance tasks.[54]

Unfortunately, empirical reality demonstrates that relatively few states have found the institutional "magic bullet" by which they can manage resources and provide incentives for officials to work in conjunction with service recipients to accomplish important tasks.[55] Most prominent among the success stories are the newly industrialized countries (NIC) of East Asia, which were able to develop the institutional capacity necessary to pursue rapid economic growth through the last half of the 20th century.[56] The institutions structuring relationships between state and private actors were vital to developmental activities, especially those which embedded officials with private business.[57]

The embeddedness of state actors in relationships with private interest has parallels to the development of PIM. Generally, in developing PIM, state officials seek to encourage water user organizations linking farmers together for collective action in water distribution and management. Public servants also need these organizations to provide

---

[54] See Ostrom 1990.

[55] For a treatment of the follies of ignoring incentives while pursuing development goals see Easterly 2001.

[56] Amsden 2001; Booth 1999; Haggard 1990.

[57] Evans 1995; see also Schneider 2004. Kang (2002) argued that this embedding created a mutual hostage relationship rather than one where bureaucrats became beneficent.

information as to farmers' needs and capacity to accomplish tasks and operate and maintain infrastructure. The embeddedness of local officials with farmer organizations would ideally provide similar benefits to those experienced by business associations, including improved availability of reliable information as well as increased credibility, reciprocity, and trust. Where government officials are able to collaborate with farmers without collapsing into rent-seeking, we should expect an increase in efficiency and agricultural development.[58] The institutional incentives that embed officials with private actors are important to accomplishing these difficult developmental tasks.

For instance, the rules regarding promotion and salary increases greatly influence the incentive structure of civil servants. As economists say, “People do what they get paid to do; what they don't get paid to do, they don't do.”[59] Despite the cynicism in that comment, it reflects the truth that people respond to the incentive structure given them. Thus, if an irrigation official faces promotion and salary bonuses if she works on an unnecessary dam-building project rather than coordinating with farmers to develop more efficacious small-scale technologies, the official is more likely to choose the infrastructure project.[60] On the other hand, if the civil servant depends on farmer satisfaction and cooperation with the local water user organization for job security, farmer interests and satisfaction will become much more important.[61]

Why, then, does one state develop a series of institutions for effective farmer-agency collaboration on system operations and maintenance while another chooses

---

[58] Schneider and Maxfield 1997.
[59] Easterly 2001, xii.
[60] See the example of the Royal Irrigation Department of Thailand, which ignored local farmer interests in its efforts to build dams in Northeastern Thailand during the 1980s. Bruns 1991.
[61] See the example of Taiwan's Irrigation Associations. Lam 1996.

agency rules and regulations which promote construction and rehabilitation of a system rather than maintenance? The institutions derive from policy choices, which are shaped by politics.

Institutions and their Origins

Here we are faced with two sets of institutions. One set are those institutions within the bureaucracy that either promote or discourage collaboration between agency employees and farmers. These include agency rules regarding the source of agency funding, regulations about promotion and raises, monitoring rules, and the legal status granted farmer organizations. The second set of institutions are the actual water user organizations, which irrigation agencies seek to establish according to the rules within the agency. In this section, reviewing political science literature on institutional creation, I first explain the obstacles state agencies face when developing WUO, drawing some parallels to business associations. I then turn to the conditions that shape agency rules and regulations to encourage officials to create effective WUO; in other words, the rules which embed officials with private actors.

A burgeoning literature in political science addresses how a variety of institutions have developed. From constitutions,[62] to international institutions,[63] to varieties of capitalist development,[64] to dominant parties,[65] to elections and legislatures under authoritarianism,[66] we are learning a great deal about why and how institutions emerge from politics. All institutions are not the same in their scope or purpose, though. While

---

62 e.g. North and Weingast 1989; Weingast 1997.
63 e.g. Mansfield, Milner, and Rosendorff 2002; Bagwell and Staiger 2002.
64 e.g. Hall and Soskice 2001.
65 e.g. Reuter and Remington 2009; Reuter 2010.
66 e.g. Gandhi 2008; Slater 2005; Boix and Svolik 2009.

some issues are common to most institution-building, such as overcoming the collective action problem or solving distribution dilemmas,[67] they do not emerge from the same political process. Most work on institution development either focuses on power-sharing among elites[68] or group formation through repeated interactions[69] as the source of institutions. Few pieces address organizations created by the state to mediate the relationship between the state actors and private individuals for specific developmental purposes, such as business associations or water user organizations.

How then are these different from any of a number of other institutions? Institutions are generally the result of bargaining or negotiated compromise between actors which can both monitor and exact punishment from each other, but only at a cost. Organizations, norms, and rules emerge to diminish those costs.[70] For instance, as a ruler provides some sort of financial or power incentive to supporters, he must also provide a credible commitment that he or she will not offend loyal friends. Institutions, such as a constitution or political party, serve this purpose, solving the problem of power sharing.[71] In another example, farmers, because of mutual reliance for labor inputs to keep canals functioning, are able to independently establish a series of rules governing a common pool resource.[72] In a perfect world, such negotiated institutional outcomes would serve the interests of all parties involved. Of course, the world is not perfect, neither are institutions. They invariably have distributional consequences and inefficiencies, which

---

67 Knight 1992. Knight also argues that powerful actors can hijack the institution-creation process, forming institutions to suit their own interests rather than attain efficiency.
68 Bueno de Mesquita et al 2003; Gandhi and Przeworski 2007.
69 See Ostrom 1990.
70 See North 1990.
71 Magaloni 2008. See also North and Weingast. 1989.
72 Ostrom 2000.

benefit some at the expense of others.[73] Even so, for institutions to become self-enforcing, the parties involved must have incentives for mutual cooperation.[74]

Yet in the establishment of participatory groups, like water user organizations, by the state, the state actors involved do not generally face punishment costs from private participants. In most cases, state actors are creating the rules for water user organizations or business associations to accomplish some specific task, such as finish a World Bank-funded project[75] or gather data on business activities.[76] The farmers or businesses involved in the creation of such organizations are at a severe disadvantage in the interaction. The institutions are dictated rather than negotiated.

Under such conditions, the efficacy of the institution relies less on power dynamics and more on the incentives of state actors to delegate authority to develop local organizations and rules, something they have few natural incentives to do.[77] Local institutions, like WUO, are difficult to create. They must be context-specific, necessitating innovation and time investment.[78] They require some degree of autonomy in order to engage in the flexible decision-making needed;[79] developing states are often opposed to granting autonomy to sub-national groups.[80] They also can disenfranchise entrenched bureaucratic interests, leading to resistance from the rank-and-file street bureaucrats.[81] Similarly, they may engender fear of shifting the power dynamics between

---

73 Knight 1992.
74 See Grief 2006.
75 Molle, Nittaya, and Savakon 2002.
76 Doner and Schneider. 2000. See also Fields 1997.
77 Scott 1998.
78 See Rodrik 2007.
79 Pritchett and Woolcock 2004. For an interesting example see Kaufman's (1960) discussion of the US forest service.
80 See Mosse's (2003) ethnographic study of irrigation in India.
81 Moe 1989; 2006.

different bureaucratic offices.[82] Beyond that, developing a collaborative relationship between public officials and private business, including farmers, is fraught with opportunities to turn collusive.[83] Thus, state actors have a wealth of incentives to avoid creating effective institutions.

As a collective-action institution dictated from above would mainly serve the interests of state actors, private actors (farmers) have little incentive to participate unless they are deriving some obvious benefit. This explains the transitory nature of so many state attempts at creating developmental institutions.[84] For the state to create an effective institution, farmer interests must be promoted and preserved by the institution. Farmers must either be able to exercise some negotiating power over the state, or the state must face some sort of internal or external pressure that makes it dependent on the farmer participation.

I draw some parallels with business associations and their development to that of farmer irrigation organizations, as business associations have been studied in greater detail (see Table 1.3).[85] In developing countries, business associations are state-sanctioned organizations established to (1) monitor business activities and (2) promote economic development. Much like water users groups, business associations can be established by either government action or by private individuals. Those developed by the state are often nothing more than paper institutions. While a great number are ineffective, some do provide benefits to both their members and the states they call home, especially

---

82 Wade 1984.
83 Schneider and Maxfield 1997.
84 Ostrom 1992.
85 Schneider and Maxfield 1997; Doner and Schneider 2000; Schneider and Doner 2000.

those in the NICs.[86] Unfortunately, much like water user groups, little academic literature has focused on the creation of these business associations.[87]

Table 1.3: Water User Groups and Business Associations

	Water User Group	Business Association
Functions	• Diminish information costs • Contribute to water planning, including infrastructure • Coordinate farmers (upstream and downstream) • Manage and distribute water at the local level • Maintain infrastructure at local level • Educate farmers on water usage	• Diminish information costs • Lobby government to protect property rights • Provide or lobby for infrastructure • Quality upgrading • Organize for collective action – reduce capacity/quota allocation • Set standards*
Established by	Government Agency or Private Individuals	Government Agency or Private Individuals
Membership	Often Legally Mandated	Often Legally Mandated
Bargaining Power with State	Low (tied to land)	Low to Medium (threat of exit)

*see Doner & Schneider 2000

Recognizing that the main actors involved in creating such institutions are bureaucrats, we must understand the institutional framework that creates incentives for local officials to cultivate a water user organization or business association. Here I turn to the literature about the relationship between politicians and bureaucrats, which leans heavily on principal-agent models. Politicians, arguably, develop rules for a bureaucratic agency and monitor the enforcement of those rules in order to force bureaucrats to

[86] Kuo 1995.
For instance, the Pakistani surgical instrument sector has benefited from efforts of its associations to negotiate with outsiders and upgrade production quality. See Nadvi 1999.

[87] Schneider and Doner 2000.

accomplish the tasks assigned them. In a PIM example, this would mean that a political principal established the rules of the irrigation agency in order to encourage street-level bureaucrats[88] to work closely with farmers and create WUO.

Academics have identified a number of tensions in the principal-agent relationship which may lead to the development of institutions. Some scholars argue that monitoring costs shape the interaction, allowing bureaucrats with a great deal of technical expertise to slack in their duties. Political actors invent institutions, such as administrative procedures and promotion requirements, to incentivize their agents and reduce monitoring costs.[89] Others argue that the institutions of the bureaucracy are developed to take advantage of bureaucrats' technical expertise and avoid difficult political battles. Thus bureaucrats may receive a great deal of discretionary powers.[90]

These accounts of institutional development, though, do not sufficiently explain the interaction between bureaucrats and their political principals that also shape the policy process and the resulting institutions. Scholars of the bureaucracy have long recognized that because bureaucratic interests are tied to policy outcomes, bureaucrats seek to influence politicians to choose policy beneficial to the bureaucracy, resulting in "iron triangles" of policy making.[91]

Thus I identify a problem of applying principal-agent frameworks to bureaucracies in many developing countries. Bureaucratic organizations are not merely passive or neutral recipients of orders from their political principals. Once an agency is

---

88 Street-level bureaucrats are "Public service workers who interact directly with citizens in the course of their jobs, and who have substantial discretion in the execution of their work." Lipsky 2010, 3.

89 McCubbins, Noll, and Weingast 1987; Arnold 1987.

90 Huber and Shipan 2003.

91 Jordan 1981.

formed, it engages in the political process of defining itself and its duties, often independent of its mandate. As Terry Moe wrote, bureaucracies are a part of the political process, and they "must take action to reduce their political uncertainty."[92] Top-level bureaucrats will seek to influence their political superiors and develop policy favorable to their interests. Even in the United States, where principal-agent theories have long served as the basis for understanding bureaucratic control, bureaucratic agencies are engaged in finding ways to influence their political principals through election turnout or supporting certain candidates. These facts caused Moe to recently call for a rethinking of theories of political control.[93] Principal-agent theories fail to adequately explain the interactions between political actors resulting in developmental institutions.

Alternatively, a growing body of work has begun to emerge explaining why state actors might engage in creating developmental institutions. These scholars have turned toward theories of political pressures as the source of motivation for state actors to create developmental institutions. Some of this work has focused on the role of external security threats;[94] others have combined those hazards with domestic politics.[95] In both cases, political threat acts as the main impetus behind institutional creation.

I follow this line of literature and propose that the political context is the major determinant of whether state actors engage (or disengage) in developing institutional capacity. My theory focuses on the political pressures that can encourage individual actors to perform in ways that might be against their initial incentive structure.

---

92 Moe 1989, 283.

93 Moe 2006. Dixit also points out that agency relationships in politics is much more complicated than in an economic setting. Dixit 1996.

94 Desch 1996; Zhu 2002; Larsson 2008.

95 Thies 2005; Doner 2009; Doner, Ritchie, and Slater 2005.

In the next chapter, I develop this argument further, presenting a theory of institutional development based on the incentive structure and power relations of politicians and bureaucrats. In that chapter I also present my research design. Following my theory, the third chapter provides a cross- national comparison of the development of PIM policies, their implementation, and the resulting water user organizations in four countries: Taiwan, the Philippines, Indonesia, and Thailand. The subsequent two chapters delve into subnational variations in the creation and promotion of water user organizations found in both Indonesia and Thailand. The final chapter provides conclusions based on the theoretical and empirical evidence presented.

Chapter 2

Theory and Research Design

The Irrigation Bureaucracy Life Cycle

On June 17, 1902, US President Theodore Roosevelt signed the Reclamation Act, establishing what would later become the United States' Bureau of Reclamation. Reclamation, at the time, was synonymous with irrigation. It was the act of "reclaiming" dry land through irrigation so that it would become suitable for agriculture. The agency built an extensive network of irrigation canals and dams across the American West during the following decades. Under its watchful eye, the deserts from California to Kansas and Idaho to Arizona bloomed.

About 90 years after its founding, though, the agency began to downsize. As my grandfather was fond of saying, "the ditches have been dug" and many irrigation projects are now operated and maintained by water users, either through irrigation associations or water ownership corporations. While the agency still remains to coordinate water resources and dam maintenance, its initial goal was largely completed. Beginning with initiatives under the Clinton administration, by 2000 the bureau had shrunk to four-fifths its 1993 size,[1] with the expectation that it would continue to diminish in size.[2]

The US Bureau of Reclamation provides an illustration of what the promoters of

1 United States Bureau of Reclamation 2000.

2 This trend reversed in the mid-2000s with budgetary increases, but the budget remained lower than 1994 levels until 2006 when it eclipsed $700 million. Sharp increases in spending took the Bureau's budget to well over $1billion in 2009. This is reflected, though, in the agency's turn from irrigation toward electricity production combined with government efforts to stimulate a struggling US economy.

Irrigation Management Transfer see as the ideal irrigation agency life cycle. Early in its existence, the bureaucracy should engage in infrastructure development, promoting canals and dams. But as all the ditches are dug and all the dams are built, the agency should mature and fade into a secondary status. Water user organizations should emerge which take the primary responsibility for water distribution and maintenance through cooperation and consultation with the agency. After transferring irrigation management to water user organizations, the need for a large bureaucratic staff should disappear.[3] Engineers who built dams should retire without being replaced by new dam-builders. Especially when few, if any, dams remain to be built.[4] The mature bureaucracy should then engage in maintenance of the infrastructure it has built and coordination with farmers for water distribution.

Yet this pattern is absent in most developing countries. Irrigation agencies the world over continue to focus on building infrastructure and engineering, even when experts argue the construction projects are unnecessary. Irrigation Management Transfer efforts have stalled and, in many cases, completely failed. The institutions necessary to engage farmers in participatory management have not emerged in the ways expected and promised.

This chapter provides a theoretical explanation of conditions that encourage states to turn toward participatory institutions and diminish centralized bureaucratic control. My theory is built upon the incentive structure of policy actors. I introduce two concepts that affect those incentives and can either turn actors toward bureaucratic reform or away

3 See the example of the Bureau of Reclamation in the Columbia River Basin. Svendsen and Vermillion 1994.

4 The US Bureau of Reclamation is currently engaged in decommissioning dams.

from it. I then discuss the implications of my theory at both the national and local level, including the hypotheses which my research is designed to test. The final section of the chapter presents my research design.

Water User Organizations, or the Dependent Variable

In the first chapter, I identified two sets of institutions. The main outcome I seek to explain is whether or not the state irrigation agency creates effective institutions for farmer participation, i.e. water user organizations. These organizations, though, emerge out of an intervening variable of policy reform for PIM, which also involves institutions within the irrigation agency, including regulations for promotions and monitoring of officials, as well as legal rights granted water user organizations. At this point, I will focus on the first set of institutions, water user organizations. Later in the chapter I will discuss the institutional reforms necessary to create them.

There are two different concepts in the irrigation literature, which I want to be clear about. First, irrigation management transfer (IMT), which is defined as the devolution of governing authority and ownership over irrigation to farmers. The second is participatory irrigation management (PIM), which means farmers are consulted and included in irrigation construction, operations, and maintenance. Ownership, or ultimate authority over the irrigation system, remains in the public sector. These are two distinct concepts. An FAO report puts it this way, "while the IMT concept intends to replace the role of the government, PIM seeks to strengthen the relationship between water users and government by adding farmer participation to government management."[5] While IMT is generally the final goal of irrigation reforms, I prefer to use the term PIM as it can

5 Garces-Restrepo, Vermillion, and Munoz 2007, 4.

conceptually encompass arrangements for co-production or co-management of water resources as well as arrangements where IMT has been implemented. Also, even among the most successful cases, IMT does not mean that irrigation agencies completely give up ownership of canals to water user groups and disappear.[6] Instead they move into the higher levels of water management and continue to work with farmer groups to deliver water to users, thus retaining a measure of co-production between government and private groups.

PIM often means that farmer groups and volunteers actually manage the allocation and distribution of water at the tertiary (most local) canal level with some management inputs at the secondary and primary levels. It also includes farmer consultation in developing yearly water plans and building new infrastructure.

What, then, does a water user organization look like, and what does it do? Water user organizations (WUO) may come in a variety of sizes, but generally they encompass all the farmers who share a water source, such as a canal, tank, or reservoir.[7] The number of farmers involved can range from fewer than ten to thousands, but the different sizes are generally referred to by different names (teams, groups, associations, etc.). I am most interested in larger associations, those with hundreds to thousands of farmers. Even so, I will treat smaller groups in the analysis as well. These associations often do not align with village boundaries as canals and water sources weave their way through multiple villages. The organization is usually led by either an individual elder or a small group of leaders who are chosen from among the members. These leaders direct the activities of

6 Indeed, it might be argued that ownership over a common pool resource such as water should not be delegated to private organizations. See Svendsen and Vermillion 1994.

7 A tank refers to an artificial pond or lake of captured rainwater which is then slowly released to be used for irrigation.

the organizations, for which they may or may not receive a token wage.

One basic duty of water user organizations is to coordinate collective action of farmers for maintenance tasks, such as cleaning and repairing canals or fixing broken water pumps. While membership responsibilities may be paid through labor, often these come in the form of fees and monetary contributions. Leaders are responsible for collecting fees, directing labor, and contracting out maintenance activities. One way of doing this is to hire or appoint a water master, or an individual who takes on the responsibility of monitoring headgate[8] activity, informing farmers of their time allotment for water withdrawals, and performing minor maintenance on infrastructure.

Another duty of water user organizations is to manage water allocation across members. The primary responsibility here rests with the leadership, but monitoring also falls on the shoulders of members. Since leaders and water masters cannot continually watch over each possible point of water extraction, farmers are responsible for watching their neighbors. Conflicts over water are then reported to organization leadership, who can act as mediators.

A third activity is to develop and coordinate crop and water distribution plans. Farmers must coordinate with one another for cropping patterns in order to ensure that sufficient water is available for their fields. For instance, water demands of rice are much higher than crops like corn or cassava. If downstream farmers wish to plant rice, they need to coordinate their crop plans with upstream farmers to ensure that access to water will be sufficient. They may develop a weekly water plan which includes three days of water for upstream farmers while four days of the week water is released for downstream

8 A headgate is a water diversion point, often controlled through opening or closing a portal or gate.

farmers. These crop and water distribution plans are highly dependent on seasonal water fluctuations and crop prices; thus regular coordination is necessary.

Finally, water user organizations involve information transfers with government officials. Information must be transferred in both directions. First, training and water limits are passed down from the bureaucracy to individual water users through the WUO. Second, information about crop types and water needs should be aggregated and passed upward to the bureaucracy.

Figure 2.1: Water User Organization Responsibilities

- Manage water distribution at local level
  - open and close headgates
  - monitor farmer withdrawls
- Collect data on water needs from farmers
- Report water needs to bureaucracy
- Collect water user fees
- Organize infrastructure maintenance
  - collective labor projects
  - contract repairs and maintenance
- Manage water user conflicts
- Develop yearly water plans
- Inform farmers of their yearly allocation
- Inform farmers of their responsibilities

Water user organizations, then, become institutions of co-production.[9] In other words, the service provided depends on cooperative inputs from the service recipient. Irrigation agents cannot provide as complete a service alone as they can with farmer's input. Much like other institutions for co-production, such as Parent-Teacher Associations and Business Associations, WUO require that bureaucrats rely on participation from service recipients to accomplish the tasks relegated them.[10]

9 Whitaker 1980.
10 See Ostrom, Schroeder, and Wynne 1993.

To make these concepts concrete, I provide an example from my family's farm in Idaho. Our WUO is called the Teton Island Canal Company, as it is a private corporation that sells shares of water to its members. The organization has legal rights given it by the state of Idaho to a certain amount of water per year which flows through the canal. Members of the company pay for shares of that water each year. If a farmer or land owner does not own a share of water in the organization, he or she is not legally able to with draw water from the canal.

The board of directors are farmers along the canal who are elected yearly to serve. They hire a water master for three-year term, who is also a member of the canal company. The water master is delegated the responsibility of monitoring and maintaining the canal with help from members of the company. He contracts canal repairs and coordinates water flows.

When a farmer wishes to draw water from the canal, he or she must contact (1) the water master and (2) neighbors who share the tertiary canal. If water is available and the farmer has paid their fees, the water master turns water down the diversion canal to the farmer for an allotted period of time. Neighbors monitor each others' water access. A certain amount of flexibility is involved as long as water is abundant. Toward the end of the summer, though, as water is increasingly scarce, monitoring becomes more important.

If a farmer notices that a neighbor is taking more than their share of water, they are able to report it to the water master who will confront the offending farmer. If the offense is too often repeated, fines may be levied against the farmer. Punishment might also include a loss of water shares or exclusion from the organization. A final threat is

legal action.

From this simple example we can see some important institutional rules which make the WUO function relatively well. First, there is a clearly established boundary of who is and who is not a member of the organization. There is also a cost associated with membership. Second, exclusion from the association also means exclusion from access to water. Third, legal rights and responsibilities granted to the WUO provide it the power to enforce contracts by appealing to law enforcement. Finally, farmers own water rights, thus giving them a sense of ownership and investment in the system.

You may have noticed that this example does not include state actors. The canal company at the lowest level functions largely independent of the state. Bureaucrats only come into the picture when decisions are made about the yearly allocation of water to the canal company and the yearly cropping plan. This example aligns most closely with full implementation of IMT policies.

One final note, please do not misunderstand my example. I do not mean to say that farmers in Idaho have it right while others do not. The fact is that water conflicts still occur. The example is merely to show how a fairly effective WUO functions within a specific context. The rules that operate in Idaho would need adjustment to work elsewhere. Alternate institutions would be necessary.

Of utmost importance, the state must provide some incentive to farmers to become involved in the WUO. Unfortunately, this point is overlooked by most policy makers. Membership in a WUO is often legally mandated, but few incentives are provided for active participation in such a group. Many technocrats work on the

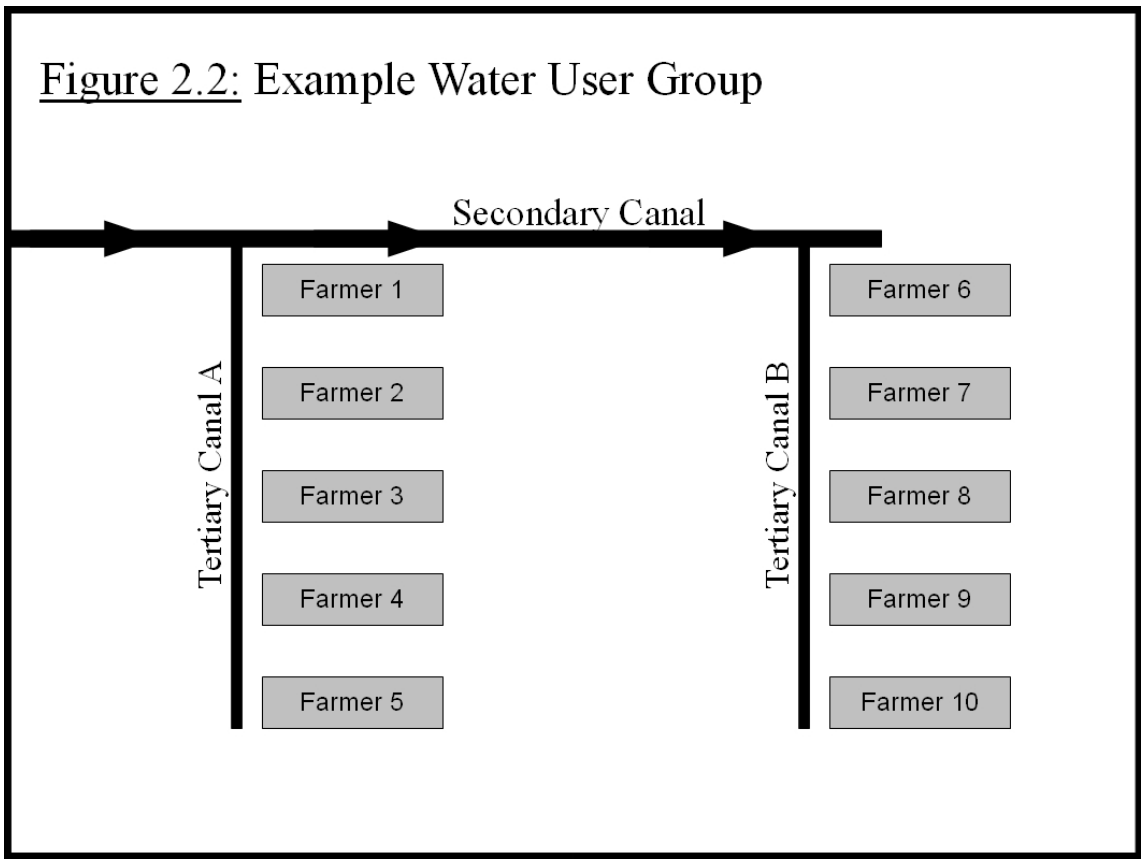
assumption that the obvious good of an organization is enough to encourage farmers to take part in it. Thus the world is littered with “paper organizations” which have names on the books, but no actual participation.

Incentives for farmers to take part in WUO come from a recognition that the WUO does provide some discernible benefit to farmers. In other words, the WUO must provide some sort of club good, or semi-excludable service. Farmers who are active in the WUO need to experience a benefit not found outside the organization. This is where so many institutions go awry.

Surface water irrigation, by its very nature, is difficult to make excludable. In the absence of a favorable institutional framework, a farmer who doesn't participate in the WUO is often just as able to access water as one who does.

For clarification, imagine a small canal system in a developing country where water rights are held exclusively by the state and water user organizations are granted no legal authority to enforce their rules. The canal system consists of one secondary canal with two tertiary canals, each with five farms located along their banks, as illustrated in Figure 2.2. In our hypothetical example, an irrigation official is charged with creating water user groups to operate and maintain the canal systems under his jurisdiction in compliance with World Bank loan requirements. The official decides that these ten farmers should form a group; it is a simple system, and he believes that the farmers are capable of cleaning the canals of weeds and refuse periodically as well as opening and closing their own water diversion points, which would reduce his workload. After a brief visit to the area, he records all ten farmers' names in his roll book, and assigns them

responsibility for the system. They are supposed to collect a small fee each year to help pay for minor maintenance costs.[11] Farmers are also supposed to gather periodically for cleaning assignments. Farmer 4 on Tertiary Canal A is chosen as the leader, as he is the best educated among the farmers.



Shortly after the establishment of the group though, the upstream tertiary canal's (Tertiary Canal A) farmers, decide not to pay their water fees and avoid service requirements to maintain the secondary canal beyond their own water diversion point. Despite this, they are still able to easily access more water than their downstream

11 These might include photocopies of water plans, shovels and picks to clean the canal, and refreshments for meetings.

neighbors by permanently opening their water extraction point. Also, on the downstream canal (Tertiary Canal B), two of the farmers refused to take part in the water user group activities because they didn't trust the farmers on the upstream canal. These two (Farmer 6 and Farmer 7), though, because their farms are adjacent to the canal, cannot be denied access to the water as it passes by. The tail-end farmers (8, 9, and 10) soon realize that their water access is the same as it was before the group was established, and they also abandon any group activity.

The failure of the group is due to the problem of free riders, or farmers who are able to access the water without investing time or resources in the institution. Because of the opportunity to free ride the system, there is little incentive for many farmers to pay the extra cost of organization fees or time commitments.

Yet certain rules and social norms, in other words, certain institutions can make WUO effective. Even without a standard blueprint for the perfect institutional framework,[12] a number of indicators exist that are more favorable for participatory management and service provision. These include regular contact between farmers and officials through both meetings and informal discussions, farmer volunteers being involved in water management, legal rights and privileges reserved to the water user organization, the length of time a bureaucrat is in one locale and his or her connection to that region, and consultation between officials and farmers about distribution decisions.[13] These rules or institutions determine the effectiveness of a WUO.[14]

12 The lack of blueprints for effective institutions is not just limited to irrigation. See Nelson's (1999) work on health and education. See also Rodrik 2007.

13 See Uphoff 1991; Wade 1988; Lam 1996; Tsai 2007.

14 Here I would like to emphasize again that my main dependent variable is whether or not the water user organization is successful in regard to tasks outlined in Figure 2.1. I make no claims regarding the actual efficiency in water management of the groups. I operate under the idea that a functioning WUO

State Actions to Create Effective WUO

How then does a state create a water user organization? Here I turn to the second set of institutions and the reforms necessary for a state to cultivate an effective WUO.

First, states must grant some sort of legal authority to WUO. These include rights to access and control water flow and distribution. If an organization has no right to water nor legal authority to enforce organizational rule and punish defectors, it is almost impossible for the group to develop the excludable benefit to group members. Without that exclusivity, the temptation to free ride soon overwhelms the organization, as demonstrated above.

Second, states must provide incentives to street-level officials to work with farmer organizations. This involves creating a monitoring mechanism through which the interaction between irrigation officials and farmer groups is evaluated. In Taiwan, as discussed in the next chapter, the Provincial Water Conservancy Bureau evaluated irrigation officials' performance through the collection of water user fees from farmers. If farmers were slow to pay their fees or refused to do so because of dissatisfaction with the local officials, the officials faced serious consequences. Other institutional mechanisms could include making the irrigation agency dependent on funding from water users, implementing farmer satisfaction surveys, hiring officials whose jobs are devoted exclusively to participatory work, or developing a promotion and raise scale based partly on participatory work.

Beyond these innovations, irrigation agencies may also change their evaluation

---

actually does provide the benefits to both farmers and the state which have been argued by irrigation experts. The question of whether these claims are well-founded or not is a subject for other inquiries.

mechanisms for participatory work. Traditional irrigation agency measures include items such as quarterly reports based on budgets and short-term, easily measurable construction outputs. For example, monitoring an employee's performance based on how many meters of canal he or she has built in the past three months is much easier than measuring their efforts to encourage community participation. Trying to transpose such quantitative measurements directly onto developing water user organizations can be problematic. For instance, in 2003-2004 when the Thai Royal Irrigation Department decided to emphasize participatory irrigation management, the agency evaluated success by the number of WUO each regional office could establish. In a two-year period the number of registered water user groups in the country jumped by over 5,000. Most were merely paper organizations, though. Agencies must develop more appropriate measures to evaluate the success of farmer organizations.

Such institutional changes seem simple on paper, but they are very difficult to both create and implement. They involve high information, monitoring, and transaction costs. Vested interests will often resist changes in both the legal structure and changes in the irrigation agency.

Choices of Policy Actors

Institutions evolve out of the implementation of policies, which are shaped by the choices of policy actors.[15] In my theory, policy makers are faced with three stylized policy choices: (1) institutional reform; (2) minor or incremental reforms which are

15 Policy implementation is vastly different from policy creation. Implementation involves a larger number of actors and is largely shaped by the incentive structures of bureaucrats. In order for a policy to actually be implemented as imagined by policy makers, incentives of the street-level bureaucrats much be structured to promote their compliance with the desires of policy makers. This is a costly and complicated endeavor. See Pressman and Wildavsky 1984; Lipsky 2010.

passed on to the bureaucracy or local government for implementation; and (3) status quo maintenance. By institutional reform, I expect that the rules and organizations structuring interaction between officials and service recipients are dramatically reshaped to promote participatory management, transparency, and enhanced service provision. For example, Ferdinand Marcos pushed for dramatic irrigation agency reform in the Philippines during the 1970s. His political legitimacy was based, in part, on his argument that "bread is more important than freedom," and irrigation was vital to that goal. Reforms included granting legal authority to irrigation associations as well as tying agency incentives to farmer welfare.[16]

In contrast, minor or incremental shifts result from limited policy changes, such as a vague mandate for participation that is then passed on to the bureaucracy or sub-national governments for elaboration and implementation. Indonesia's government did so with the 1987 Irrigation Operation and Maintenance Policy in response to pressure from international donors. The policy established water user organizations, but it did not include any reforms to strengthen them or monitor irrigation agency officials' actions towards them. It resulted in the formation of paper organizations but very little actual farmer involvement in irrigation.

Status quo exists as long as no new policies are implemented; generally a state wherein little or no PIM exists. Thailand exhibits such policy stability; the country's irrigation laws have remained unchanged since the 1960s, and many of the rules regarding irrigation hearken back to the People's Irrigation Act of 1939 and the State Irrigation Act of 1942.

16 The examples used here are discussed in detail in Chapter 3.

Institutional reforms are the most costly of the three options for policy makers. In order to both design and implement major institutional reforms, policy makers must commit resources, time, and effort into crafting extensive formal rules and practices and monitoring the implementation of those formal rules, often involving major bureaucratic reforms.[17] These actions can upset those who hold vested interest in maintaining the system. Such reform entails extensive information costs and expenditure of political capital. Developing vague policy that can then be passed to the bureaucracy for elaboration and enforcement is much less costly in both information and political wrangling.[18] It is also typically less effective at reaching a nation-wide goal of participation as the incentives for bureaucrats to comply with the policy are lacking or inchoate. Generally the least costly option is to maintain the status quo.

So, then, how do we explain one country's adoption of PIM institutions while others do not?

Actor Incentives

As previously mentioned, my argument focuses on actor incentives. First, I identify three general sets of policy actors: national and local politicians, top-level bureaucrats, and street-level bureaucrats. I then explain a few assumptions regarding actor preferences.

First, policy makers, or politicians, are generally most motivated by their opportunity to remain in office. This does not exclude them from having ideological or altruistic motivations, but being a political leader is a time-consuming business.

17 Ostrom 1990.
18 Huber and Shipan 2003.

Politicians will generally choose to engage in the most cost-effective type of policy making possible. They will also react most strongly and quickly when they are faced with the probability that they will lose office if they do not act on a certain policy area. Without that threat, they often allow the status quo bureaucratic institutions to deal with policy issues as they appear.[19] Thus their preferences are ordered: (1) status quo; (2) vague policy; (3) institutional reforms.

Here it is important to remember that a single policy arena does not exist in a vacuum. Policy makers are able to move within a policy space, even when faced with crisis situations.[20] They make these choices according to an evaluation of the costs. In mathematical terms, the ratio of the cost of maintaining the status quo to that of institutional reform must raise to a value equal to or greater than one before a move will be made toward institutional reforms. Otherwise politicians will choose to enact policies that fall short of institutional reform.

My theory assumes that this incentive structure holds for both democratic and authoritarian regimes. While democratic leaders are subject to the threat of electoral pressure to provide public services,[21] dictators also face pressures, as noted by the Marcos example from the Philippines in the previous section. Scholars have argued that dictators are under threat to produce economic development in order to justify their rule and enhance their own long-term welfare; their ruling coalitions require policy responsiveness in exchange for support.[22] Thus dictators need to gain legitimacy through both policies

19 Grindle and Thomas 1991.
20 Ibid.
21 Ansell 2008; Lake and Baum 2001.
22 Bueno de Mesquita et al 2003; Olson 1993.

and institutions which cater to their supporters or win over possible enemies.[23] Because both dictators and democrats are motivated by similar incentives to remain in power, they both create policy in response to the threat of losing office.

Second, top-level bureaucrats desire to remain autonomous from policy maker's meddling and expand their bureaucracy's influence and power. They often have spent much of their lives in the bureaucracy and they view policy makers as less capable of determining the needs of their bureaucracy than themselves. They will resist reforms, as those reforms often include their retirement or loss of power.[24] If they are politically powerful enough, they will seek to block policy maker's attempts to change or reform the bureaucracy. Thus institutional reform is the least attractive option for top-level bureaucrats.

I am agnostic as to the ordering of top-level bureaucrats' incentives regarding the choice between a minor policy change and the status quo. On the one hand, a minor change may give them additional access to resources, but it may also saddle them with the costs of appearing compliant to policy maker demands or making minor adjustments. Status quo policies allow them to avoid these costs, but may not provide them the additional resources they seek.

Third, street-level bureaucrats, or the local agency officials charged with actually implementing policy, respond to the incentive structures created by the institutional

23 Gandhi and Przeworski 2007. Gandhi 2008.
24 Garces-Restrepo, Vermillion, and Munoz 2007. See also Therkildsen 2006.

organization of the bureaucracy.[25] Their incentives are based upon building up their careers and maximizing their pay. To restate to a simplified example from the first chapter, if the rules for promotion are based on favorable reports from service recipients, the official is more likely to focus on pleasing a service recipient. If, instead, they are based on glowing reports from their section chief or working on new infrastructure projects, the bureaucrat will seek after those opportunities. Even when street-level bureaucrats have personal commitments to serve, their efforts can be drowned by the institutional requirements of the job.[26] Institutional arrangements of the bureaucracy largely determine who officials view to be the object of their attention, whether it is the recipient of their services or their bureaucratic boss.[27]

Generally, unless institutions are carefully structured, street-level bureaucrats have few incentives to engage in direct participatory work. For instance, irrigation officials and agriculture extension officers often find that working directly with farmers is more difficult and pays fewer rewards than being engaged in large infrastructure construction projects or working in central offices.[28] Even when engaged directly with farmers, it is difficult to encourage street-level bureaucrats to consult and pay attention to farmer input rather than adopt top-down approaches such as dictating farmer compliance with policy.

Changing Incentive Structures

Recognizing that policy actors have incentives to avoid institutional reform, I now turn to the inputs that may compel policy makers and bureaucrats to change the rules and

25 See Pressman and Wildavsky 1984.
26 During field visits in Thailand, local civil servants complained that they couldn't be as responsive to farmer demands as they would like due to central bureaucracy requirements. Interview, Irrigation Official, Nakhorn Phanom, Thailand, June 24, 2009. See also Lipsky 2010.
27 Kaufman 1960.
28 Lam 1998.

organizations established for irrigation. Here I introduce two variables which interact to determine whether or not policy makers will choose to engage in costly institutional design. The first is the degree of *political vulnerability.*

Political vulnerability is the degree to which a policy maker is in danger of losing office due to his or her actions on a specific policy issue. It does not necessarily affect other policy issues. For instance, President Susilo Bambang Yudhoyono of Indonesia faced severe concerns about corruption during his first term in office (2005-2009). With the country perceived as among the least business-friendly in the region, Yudhoyono campaigned as a candidate who could fight against corruption.[29] Because of this, his administration was forced to treat the policy issue seriously and support the Corruption Eradication Commission (KPK), which was established shortly before Yudhoyono came to office. The President even allowed the KPK to target members of his own family.[30] He also led efforts to diminish the military's role in business and reinforce the capacity of the courts. If he had not been perceived as tough on corruption, he would most certainly have lost his re-election campaign in 2009.

In contrast, he faced little domestic pressure or threat from being lax on forestry policy. Thus Indonesian forests continued to be leveled to make way for palm oil plantations throughout his presidency, with very little effort expended to limit the illegal logging. Estimates state that 5.4 million hectares of forest were cut down from 2005-2009.[31] In this brief example,Yudhoyono faced political vulnerability in dealing with

29 Buehler 2010. As Yudhoyono has progressed in his second term, his anti-corruption stance has not achieved as much as some had hoped. See Buehler 2012.

30 Tedjasukmana, Jason. “Protesters Rally for Indonesia's Anti-Graft Unit.” *Time Magizine*, November 9, 2009.

31 Antara & Fidelis E. Satriastanti. “ICW Puts a Price on Deforestation.” *The Jakarta Globe,* February 23, 2011.

corruption, which had little affect on a number of other policy issues, such as forestry management.

This contrasts to the systemic vulnerability concept developed by Doner, Ritchie, and Slater in that it is policy-specific and institution-specific.[32] While systemic vulnerability combined a triple threat of popular unrest, security concerns, and budget constraints wherein the entire existence of the country might be in question, with political vulnerability only the policy maker's tenure is threatened. This does not mean the two concepts are mutually exclusive, though. A politician in a state experiencing systemic vulnerability will most likely experience political vulnerability on a number of issues. Thus he or she will direct their efforts to institution building in those areas.

Also, institutional capacity is not considered as a nation-level variable. I do not argue that political vulnerability will necessarily result in a developmental state. Instead, political vulnerability should result in institutional innovation on a specific policy issue, sector, or in a specific region. This can happen at either the national or local level. Thus, I set a much lower bar for institutional creation than that developed by Doner, Ritchie, and Slater. This parsing out of vulnerability by policy area or region can also explain why we empirically observe that states experience sub-national variation in institutional development across policy issues or geographic regions, such as regional distinctions between wine producing areas in Argentina.[33]

To further clarify this distinction, I draw an analogy to two homes in need of some repair. In one home the entire house is in danger of being condemned, thus the

32 Doner, Ritchie, and Slater 2005.

33 McDermott (2007) provides an interesting comparison between the wine industries of Mendoza and San Juan; unfortunately he does not explain the politics behind the variation. See also Tendler 1997.

homeowner must invest resources to completely gut the building and rebuild the forms, walls, and supports to meet code and maintain the house. This is analogous to systemic vulnerability. The second home, though, is not in immediate danger of being condemned, but individual projects require urgent attention such as broken plumbing in the bathroom. Thus the bathroom might be remodeled while the kitchen is left alone. This would be analogous to political vulnerability.

Political vulnerability may emerge from a variety of sources, including budget constraints, political competition, coalition pressures, and/or resource demands.[34] It also may be composed of different sources across different policy arenas. For example, a drought, and the accompanying reduction in water availability, may cause crop failure unless the state engages in efforts to develop effective irrigation systems. Such crop failure can lead to a loss of national food self-sufficiency, rural unrest, and increased food prices and discontent in urban areas, all of which may threaten a political regime.[35] Thus, when facing a drought, a political leader may feel pressure to reform irrigation policy but no urgency to change education policy. Each source of vulnerability may be sufficient alone or in some combination to compel policy makers to take on the difficult task of developing institutional capacity, such as that necessary to encourage PIM.

Unfortunately, though, political vulnerability alone is insufficient to result in institutional reforms. As mentioned above, top-level bureaucrats also have preferences to avoid the reforms that evolve out of policy makers' political vulnerability. Adapting a concept from Heredia and Schneider, I argue that *bureaucratic fusion*, or bureaucratic

34 See Lake and Baum 2001; Waldner 1999; Grindle and Thomas 1991; Slater 2005.
35 See Bates 1981.

control over the policy process either through an agency's political acumen or through institutional means, can prevent institutional reforms from taking hold.[36] Top level bureaucrats are highly motivated to resist changes with their organizational structure as such changes often involve early and unwanted retirement.[37]

In cases of bureaucratic fusion, the bureaucracy is tightly linked to politics.[38] This may come through two mechanisms. First, formally, top officials control the policy process. They may be appointed to legislative positions or the bureaucracy may be the pathway to political office. In such cases, there is little difference between a politician and a bureaucrat. In principal-agent terms, the agent become the principal.[39] Such arrangements appear more readily in authoritarian regimes.

The second mechanism is through the political ties between the bureaucracy and politicians. The agency may be seen as the spoils of political victory, through which politicians gain access to resources. Thus top officials are able to exert special influence over the policy process in order to maintain open channels to monetary resources. Strong ties between bureaucracies and politicians may cause politicians to avoid placing high priority on bureaucratic reforms despite vulnerability, as a loss of bureaucratic support can be politically and financially costly.[40] Instead, a policy maker who is faced with high levels of bureaucratic fusion will choose to promote policies that protect the bureaucracy's interests. Unless politicians are free from such ties, they are unlikely to

36 Heredia and Schneider 2003.
37 Peters and Pierre 2001; Therkildsen 2006.
38 I assume that bureaucratic fusion is an exogenous condition, as the relationship between bureaucrats and policy makers is often long-established before the question of institutional reform is presented (Heredia and Schneider 2003).
39 See Dixit 2006.
40 Batley and Larbi 2006.

promote institutional reforms.

This is not to imply that when bureaucratic fusion does not exist, bureaucrats willingly apply the policies given them. We know that bureaucrats do often shirk in the implementation of policy.[41] All that the presence of bureaucratic fusion indicates is that bureaucratic reform will not happen, even under conditions of high political vulnerability, because the exogenous fusion will increase the cost of reforms. Without fusion, though, policy makers may or may not engage in the costly monitoring and institutional design necessary to accomplish their policy goals. The ability and determination of policy makers to do so is conditioned on the degree of political vulnerability they face.

With the foundations of my theory established, I now turn to a discussion of how political vulnerability and bureaucratic fusion affect the probability of nation-level reforms and how the susceptibility of local officials to political vulnerability can help explain sub-national variation in institutional form.

National Reforms

I apply my theory to individual states by focusing on the interaction between policy makers and top-level bureaucrats. Under politics-as-normal situations, policy makers allow top-level bureaucrats to largely control the policy situation including setting the institutional framework for incentives of lower level bureaucrats.[42] This situation is stable most of the time.

As pressures increase on policy makers, though, their incentives change. The cost of retaining the status quo increases relative to the cost of institutional reform.

41 Waterman, Rouse, and Wright 2004; Moe 1989.
42 Grindle and Thomas 1991.

Eventually, when their position becomes highly threatened, policy makers are willing to foot the political bill of institutional reform.

Yet this ratio of costs for maintaining the status quo versus bureaucratic reform has an added component: the position of top-level bureaucrats. Unlike policy makers who cycle through office, bureaucrats often retain their positions for decades under different administrations and even regimes.[43] Rather than react to political vulnerability, top-level bureaucrats will seek to maintain their power and influence by avoiding reforms.[44] Under conditions of bureaucratic fusion, the costs of institutional reform become almost insurmountable for policy makers. A highly politicized bureaucracy can weigh in on policy issues or threaten to remove their support from a policy actor and raise the costs of institutional reform, providing an incentive to policy makers to find alternative, easier solutions to their problems.

The predicted effect of political vulnerability and bureaucratic fusion are presented in Figure 2.3. When political vulnerability is low, the cost-to-cost ratio of status quo vs institutional reforms remains well on the side of maintaining the status quo. Politicians may engage in policy changes, but they will not approach that needed to reform institutions.

Similarly, under conditions of high fusion, I do not expect that politicians will engage in national reforms. This is due to the entanglement of bureaucrats with policy makers. Policy makers facing these conditions know that the cost of institutional reform will be higher than or equal to the cost of maintaining the status quo. As their political

43 Burns and Bidhya 2001.
44 Heredia and Schneider 2003.

supporters within the bureaucracy abandon them, their tenure would be threatened. They would rather seek less costly ways of mitigating their political vulnerability. This results in an institutional status quo.

Figure 2.3: Predictions Regarding National Reforms

	Little to Moderate Political Vulnerability	**High Political Vulnerability**
Low Fusion	1. No Change - Status Quo or Vague Policy, Status Quo Institutions	2. Success - National Institutional Reforms
High Fusion		3. Reform Foiled - Status Quo Institutions

On the other hand, when bureaucratic fusion is low, but political vulnerability is high, the cost of institutional reform is lower than maintaining the status quo. For politicians, these crises of tenure provide them with incentives to develop formal rules and programs geared toward alleviating the pressure they face on the policy issue. These pressures result in national institutional reforms.[45]

To restate, the hypotheses garnered from this portion of my theory are:

Success: Under high levels of political vulnerability and low levels of bureaucratic fusion, policy makers should expend the resources necessary to reform bureaucracies for PIM.

No Change: Under low to moderate levels of political vulnerability and low levels of bureaucratic fusion, policy makers will not implement the policy necessary for institution building.

Foiled Reform: Under conditions of bureaucratic fusion, no matter the level of political vulnerability, policy makers will find the cost of institutional reform too

45 One possible variable which my theory does not account for is temporal variation on vulnerability. How long does political vulnerability have to last in order to compel institutional reform? Also, does the length of political vulnerability affect the efficacy of bureaucratic fusion? These are questions I will return to in the concluding chapter.

high and will maintain status quo institutions.

The question may be asked as to why forward-thinking policy makers don't preempt political vulnerability with some policy before it happens. In other words, isn't there an issue of endogeneity with political vulnerability and PIM? The fact is that irrigation, unlike health care,[46] is not a high-profile policy issue. It is difficult for politicians to claim irrigation a good which they have provided, since irrigation water is one of only many inputs in agriculture. A good water year doesn't necessarily translate into a good harvest.

Also, the constituencies involved in irrigation are generally not "king-makers." Farmer's influence in politics is often discounted rather than the focus of intense political interest.[47] Beyond this, it is difficult for politicians to predict vulnerability due to variation in the availability of water resources from year to year. In fact, oft times politicians remedy immediate water scarcity by sacrificing future supplies rather than develop institutions for more efficient management.[48] Political vulnerability based on irrigation policy is fairly rare, thus making it an issue area that politicians are unlikely to try and preempt due to the political and information costs involved. Basically, I argue that the cost for preempting vulnerability in irrigation policy by building institutions is too high for its potential benefits. As such, it provides a test of my theory which is less likely to be plagued by problems of endogeneity than other policy arenas.

In summary, the nation level portion of my theory anticipates the successful creation of nation-wide institutions for PIM in the subset of states which experience high

46 See Selway 2011.
47 Bates 1981.
48 See Molle 2005.

levels of political vulnerability in the irrigation arena but low levels of bureaucratic fusion. It also explains the failure of national institutional reforms in those states where bureaucracies are able to raise the cost of reform.

Even in states where no national bureaucratic reforms have taken hold, empirically we observe that some locales do experience pockets of participatory irrigation management. It is this population to which I now turn.

Pockets of Participation

In explaining the sub-national variation observed in PIM, I rescale the nation-level theory to the local context. In the subset of states where no nation-wide institutional reforms have been implemented, pockets of participatory success may exist due to local political vulnerability.

At this level, two sets of actors are important: local politicians and street-level bureaucrats. While in many developing countries, local politicians do not exercise complete control over local officials, they do have some influence and their political considerations can change the behavior of bureaucrats.[49]

Under normal conditions we should expect that street-level bureaucrats, or those that provide services and have contact with the public, should act primarily according to the incentive structure provided through the bureaucracy. Promotion requirements, performance bonuses, and the perks of being a bureaucrat will generally determine how officials decide to allocate their time and energy. Working closely with service recipients is generally more difficult and distasteful than being in the central offices where

49 Grindle 2007; Careaga and Weingast 2003.

opportunities abound for career and salary advancement.[50]

With such an incentive structure, we should expect that service provision be poor without nation-wide institutional reform to direct bureaucrat incentives toward their service recipients. Instead, though, we frequently observe sub-national variations in both service provision and institutions connecting officials to the communities they serve.[51]

I theorize that when political pressure is placed on local policy makers, they will exert greater control over street-level bureaucrats in efforts to develop effective institutional structures. This responsiveness to political vulnerability, though, is conditional upon these policy makers being free of bureaucratic fusion.

At the local level bureaucratic fusion takes the form of local political structures' subservience to the central irrigation bureaucracy. In my analysis, I treat this as dichotomous, even though in reality there is a great deal of variation in the relationship between bureaucrats and local political structures. In many developing countries, centralized bureaucracies operate independently of local government control or even strongly influence local governments. The power of local policy makers depends on the degree, type, and sequence of decentralization.[52] In some cases, local politicians are dependent on the central government and local bureaucrats to accomplish tasks. Oft times, local politicians are secondary to local officials. In some states, local political figures are actually appointed bureaucrats. In essence, bureaucratic fusion at the local level comes down to a question of decentralization. Is authority over irrigation policy implementation granted to local political leaders and officials, such as village chiefs and

50 Lam 1998.
51 See McDermott 2007; Tsai 2007.
52 Falleti 2005; Bardhan 2002.

district officials, or are decisions made by the central agency? Unless local policy makers are granted some degree of autonomy and control over policy implementation, my theory of political vulnerability at the local level should not result in institutional development.

Thus the hypotheses derived from my theory for the local level mirror those at the national level:

> *Success: Under conditions of political vulnerability and low levels of bureaucratic fusion, local policy makers will engage in institutional innovation necessary for PIM.*
>
> *No Change: Under conditions of low to moderate political vulnerability, but low levels of bureaucratic fusion, retaining the status quo will be less costly for local policy makers. Thus they will prefer to avoid institutional reforms.*
>
> *Foiled Reform: Under conditions of high bureaucratic fusion, no matter the degree of political vulnerability, local politicians will not engage in institutional development.*

Varying levels of political vulnerability can serve to explain the sub-national variation observed in PIM implementation. Unfortunately scholarly literature is inchoate in discussing the source of local institutional variation, but I have drawn a number of possible sources from the literature.

First, local political vulnerability due to political competition may assist in explaining why some regions experience institutional development while others do not. Theoretically and empirically, political competition in democracies should promote greater provision of public services than in dictatorships.[53] This relationship can be translated into local politics, which is one of the main drivers behind recent links between decentralization and good governance.[54] Theoretically, as access points to political leaders

53 Bueno de Mesquita et al 2003; Lake and Baum 2001.
54 Careaga and Weingast 2003; See also Diamond 1999.

increase, so do the pressures they face to provide public services. Grindle, though, found that in Mexico increased political competition at the local level did not necessarily translate into better governance. Even so, local politicians "acknowledged a greater awareness of the need to perform their activities better because of the threat of losing office."[55] While the link between competition and good governance may be problematic, it still creates a sense of vulnerability in political leaders. Thus, I expect that the greater the level of political competition, the greater the probability that political leaders will strive to exercise control over local officials and implement PIM.

Second, hard budget constraints may force local governments and local bureaucratic offices to engage in institutional design necessary to develop PIM as participatory management reduces financial burdens, especially in operation and maintenance of irrigation systems. Scholarly accounts of good governance provide some evidence that budget constraints can force greater attention to participatory management. Tendler demonstrates that agriculture extension officers in Ceara, Brazil engaged in client-driven (farmer-driven) service provision when officials were forced to rely on farmer generosity to fund their visits due to budget shortages.[56] These client-driven relationships were flexible and customized according to farmer needs, thus the relationship between farmers and bureaucrats was more efficacious and beneficial than in nearby regions. Following this evidence, I propose that the more stringent the budget constraint, the more likely local officials and politicians are to promote PIM.

Third, pre-existent organizations between farmers may assist in explaining the

55 Grindle 2007, 83.
56 Tendler 1997.

ability of state actors to develop institutions for participation. Throughout the world, farmers have found ways to cooperate in order to manage the common pool resources they share, especially water. Farmer groups have been engaged in episodic mobilization for seasonal irrigation tasks, such as building weirs.[57] While government officials are often unaware of these indigenous mobilizations during the planning of large-scale irrigation projects, these organizations may be able to assist farmers to overcome collective action problems when pressuring officials for public services. They may also provide embedding links which can tie officials to farmer interests.[58] By tying farmers to officials, these organizations may provide a source of pressure on officials to be more responsive to farmer needs.

On the other hand, indigenous farmer organizations may not fit the formal requirements of government programs, creating disincentives for farmers to pressure for responsiveness.[59] Also, informal groups may actually provide an opportunity for farmers to exit from participation in the state's project and continue informal irrigation outside of the infrastructure provided by the state.[60] Thus they may reduce the level of political vulnerability placed on officials. Pre-existent levels of farmer organizations, then, might provide positive pressure for the development of formal participatory institutions; they may also reduce that pressure by providing alternative outlets for farmer needs.

---

57 A weir is an obstruction in a river or creek which raises the water level so that it might be used for irrigating the surrounding area. They are a type of dam, but intended not to completely halt the flow of water. Generally water will flow over the top of the weir rather than being completely blocked and released through gates as with a larger dam. See Bruns 1991; Siy 1989. This type of activity is also common to farmers in countries beyond Asia, such as Kenya. See Little 1992, 166-168.

58 For instance, see Tsai's (2007) investigation of village temple organizations in China which caused officials to provide better services than they otherwise would have.

59 Molle, Nittaya, and Savakon 2002.

60 In this case, without altruistic individuals who take part in the project, it would fail to achieve any results. See Hirschman 1970.

In conclusion, these three indicators do provide some theoretical direction for research, but they may not encompass all possibilities. My research design is, of necessity, open to recognize and investigate alternative measures of political vulnerability that determine within-country variation.

Alternate Explanations

While my theory focuses on the incentive structure of bureaucrats and policy makers and the context that may direct them toward institution building for PIM, a number of alternative explanations exist.

The most prominent could be that the efforts of international agencies, such as the World Bank, the Asia Development Bank, the International Water Management Institute (IWMI), and NGOs, encourage successful implementation of PIM policies. While it is true that the World Bank has been active in trying to promote water user groups for irrigation management since the 1980s,[61] I argue that these efforts alone fail to explain the emergence of PIM. Initially, because the efforts of international agencies and NGOs are so widespread, if they were successful, we would expect to see widespread successful water user organizations in most developing states. We do not. Also, the programs advocated by international agencies have repeatedly failed in their promises to provide promotion of local groups.[62]

I would further argue that the availability of funds from international agencies has perhaps stifled the opportunity of national and local governments to engage in institutional development. If my theory is correct and political vulnerability forces state

61 Garces-Restrepo, Vermillion, and Munoz 2007; Korten and Siy 1989.
62 See Li 2007.

actors to commit themselves to costly institution building in order to protect their positions, then opportunities to diminish this vulnerability provide an attractive alternative to institutional development. International agency funds may provide such an escape hatch. Rather than engage in bureaucratic reforms or promoting participation to deal with hard budget constraints, developing country governments can turn to the international community to access funds that provide a way out of vulnerability.[63] Thus the unintended consequence of international aid may be that it blunts the pressure for institution building.[64]

Even so, international aid agencies have led much of the push for irrigation reform. Their influence, as noted above, is not uniform across countries. In essence, I see the role of international aid agencies as contingent upon domestic politics.[65] The effect of aid agencies cannot be solely credited with the development of PIM, but their influence could be a contributing factor to a country's decision to develop and implement PIM policies, especially when the country is faced with a crisis situation that increases the bargaining leverage of the international agency. In such cases, the international donor contributes to the degree of political vulnerability experienced by the government. Thus the role of international donors is not itself a sufficient explanation for the development of institutions for PIM, but it can contribute to political vulnerability.

NGOs are slightly different. While their efforts are directed toward local community development and the provision of sustainable or appropriate technologies to farmers, they exist within a political context. NGO projects can act as pilot projects or

63 Suhardiman 2008; Briscoe 2000.

64 See Slater's (2008) argument about democratic institutions and international aid agencies. See also Girod 2012.

65 Girod 2012.

examples of effective participatory management, but they rarely address the underlying political problems. Technocratic solutions often assume benevolent state actors and fail to shape the incentive structure of officials who can easily choose to ignore the relative success of NGO projects.[66] NGOs exist outside the state and the lessons from their successful projects will not develop into institutional creation as long as they are unable to address the fundamental incentive structure which blocks state actors from engaging in similar activities.

Another possible explanation for the development of PIM could be the benevolent actions of a bureaucratic leader. Some scholars espouse this interpretation of the National Irrigation Administration's development in the Philippines.[67] Sources praise Benjamin Bagadion and other top officials in the Philippines irrigation authority during the 1970s who implemented reforms which moved the organization toward a more participatory framework.[68] While I do not dispute that individual state actors can have a strong influence on institutional formation and reform, I do have questions about this causal tale. Why did this specific group of officials decide to invest the time and effort to promote participatory reform? Why were they able to encourage politicians to join their cause and draft legislation for the reforms? What were their motivations? Also, once the Philippines transitioned to democracy, were these bureaucrat-led reforms continued? If these questions can be answered, the role of a benevolent bureaucracy will have greater support. Throughout my research, I will seek for data which might lend support to a bureaucratic leadership causal story or dismiss it.

---

66 Bruns 1991.
67 Ostrom 1992; Korten and Siy 1989.
68 Ibid.

Research Design

In the first chapter and throughout the previous pages, I have referred to the nascent state of the literature, both theoretical and empirical, on the development of institutional capacities. Unfortunately, the literature on irrigation bureaucracy reform is also inchoate. Prior work has generally been focused on singular case studies. Aside from Vermillion's use of 29 case studies,[69] a recent FAO report comparing 34 countries on IMT[70], and Mukherji et al. comparison of 108 PIM projects,[71] relatively little comparative work has been done in participatory management. And that which has been done seeks to evaluate the policy rather than investigate the politics behind PIM. The data available in this arena is poor.[72]

Because of this, my research design is meant to accomplish two major tasks. First, I seek to further develop the concepts of political vulnerability and bureaucratic fusion for application. Second, I set up the design to gather the data necessary to perform a test of my hypotheses.

Reflecting these goals, I have chosen to conduct a comparative case study. This requires deep knowledge of the cases involved in order to identify indicators of my variables and evaluate my theory's validity through mapping the causal sequence of events that lead from vulnerability to institutions.

I approach my hypotheses, at both the national and local level, through a

69 Vermillion 1997.
70 Garces-Restrepo, Vermillion, and Munoz 2007.
71 Mukherji et al. 2011.
72 Both the Royal Irrigation Department of Thailand and the Public Works Department in Indonesia have poor information on farmer's groups and irrigation management. What data is available is subject to bias as it was collected by local officials in a relatively unstructured pattern. Author field notes, June-August 2009; September 2011.

"structured focused comparison" based on Mill's methods.[73] Along with these comparisons, I also use case-by-case process tracing, which will allow me to determine both causal sequence and whether or not political actors experienced the political pressures that I assert are important. I construct brief histories of each of my cases, paying special attention to instances in which changes occurred and the impetus behind those changes. This requires intensive use of primary sources, including interviews, project reports, news stories, and local records. I also employ secondary sources to supplement my research, drawn from local researcher's work on these issues. Many of my secondary sources are drawn from the field of agriculture or irrigation engineering.

The remainder of this section will elaborate my research design. First, I discuss my nation-level case comparison. Then I turn to the local-level research design and case selection. Finally I discuss my data collection strategies.

Comparing States

At the nation-level my research design is based on capturing variation on my dependent variable: national institutions for PIM. In other words, I am looking for the existence of effective water user organizations. As I am interested in a "causes-of-effects" question, I have chosen four cases based on their scores on the dependent variable which reflect similar characteristics and values on a number of contextual variables to allow me to control for as many alternative explanations as possible.[74]

I compare four countries, two of which have at some point in their history engaged in bureaucratic reforms to implement a national PIM scheme (Taiwan and the

73 George and Bennett 2005; Schrank 2006.
74 Mahoney and Goertz 2006.

Philippines) and two which have considered such a policy but have failed to effectively implement it (Thailand and Indonesia). These countries were chosen with an eye toward their similarities in climate and agriculture, as well as their experiences with both democratic and authoritarian regimes. All experience an abundance of water concentrated in a single season, making irrigation important for both drainage and water storage. Rural populations and agriculture exports were all vital to their respective economies during certain points in the countries' histories, although both have declined in importance.

Each of the four countries began at a similar level of development in 1950,[75] although their paths diverged greatly thereafter. As one of the NICs, Taiwan rapidly overtook many countries with higher economic indicators, allowing it to become one of the major economic success stories in the world. During this time, the country also developed one of the world's most effective participatory irrigation management systems.

In order to make sure that my results are not driven by the developmental success of Taiwan, I include the Philippines. During the late 1970s and early 1980s, the Marcos government reformed the National Irrigation Administration, leading it to be known as one of the most successful irrigation agencies in the developing world.[76] At the same time, the country struggled with promoting consistent economic growth. Although it is now considered a middle-income country by the World Bank, it remains at the lower end of the category.

Thailand, another middle-income country, experienced much more success at economic development, but the irrigation agency did not fare well with attempts to learn

75 According to 1960 data, per capita GDP (US dollars) was $164 in Taiwan, $198 in Indonesia, $317 in Thailand, and $611 in the Philippines. Source: World Bank, Republic of China (Taiwan) National Statistics Bureau.

76 Araral 2005.

PIM from the Philippines in the 1980s or any point thereafter.[77] Indonesia's experience has been one of rapid but uneven GDP growth, with the Ministry of Public Works managing irrigation and water resources with little success in PIM or bureaucratic reforms. Agriculture and irrigation have been important for each country's growth, and expenditures on irrigation continue to play an important role in budget allocation, as seen in Table 2.1. Even so, they have all implemented and pursued different irrigation development strategies, which provides fertile ground for comparison.

These four states provide variation on the dependent variable, while allowing me to control for alternate possible explanations, such as climate, crop type, level of economic development, World Bank involvement, and regime type.

Table 2.1: Irrigation Agency Expenditures for Selected Countries, 2011

	Irrigation Expenditures	Total National Budget Expenditures	Percentage of Total National Expenditure
Thailand	40,115.2 million baht ($1.28 billion)	2,070,000 million baht ($65.8 billion)	1.94%
Indonesia	12.141 trillion rupiah ($1.33 billion)	1,229.6 trillion rupiah ($134.24 billion)	0.99%
Philippines*	26.56 billion pesos ($607.1 million)	2,073 billion pesos ($47.38 billion)	1.28%
Taiwan	95,673 million** NTD ($3.23 billion)	1,769,844 million NTD ($59.79 billion)	5.41%

* 2012 numbers, Irrigation Expenditures include funds dedicated to irrigation infrastructure (24.5 billion) as well as NIA subsidies (2.06 billion)
** Council on Agriculture Budget, which oversees irrigation as well as a number of other rural development issues. I was unable to obtain more specified budget allocation dedicated to irrigation. Subsidies for operating the Irrigation Associations were 2.2 billion NTD in 2010, but these did not include expenditures for construction and rehabilitation of irrigation systems.

Sources: Central Budget Agencies of respective countries
US dollar amounts are approximations using exchange rates from the first week of January, 2012

77 Plusquellec and Wickham 1985; World Bank 1996. Thailand actually sent irrigation officials to the Philippines to observe PIM strategies.

Figure 2.4 provides a preview of the analysis in Chapter 3. The national cases are placed within the framework provided in the theoretical section, which also indicates theoretically what variables we should expect to matter in the analysis.

For each of the countries, I provide a historical account of their irrigation management policies, but the main thrust of my analysis are major policy shifts post-1950. This involves a number of observations, as irrigation management has shifted dramatically as the states moved through different stages of development. The institutional arrangements which determine the relationship between politicians and bureaucrats have also changed as different regime types have risen and fallen. For example, the 1997 constitution in Thailand changed the constituencies of politicians and diminished the power of top-level bureaucrats vis-a-vis politicians, which changed the way policy makers experienced vulnerability.[78]

Figure 2.4: Case Placement within Theoretical Framework

	Little to Moderate Political Vulnerability	**High Political Vulnerability**
Low Fusion	1. No Change - Status Quo or Vague Policy, Status Quo Institutions **Thailand Philippines (1986-present)**	2. Success - National Institutional Reforms **Taiwan (1956-1990) Philippines (1972-1986) Indonesia (1998-2002)**
High Fusion		3. Foiled Reform - Status Quo Institutions **Indonesia (1966 to 1998; 2002+)**

78 See Selway 2011; Bidhya 2001.

My primary focus in each country is the three main variables of interest: institutions for PIM, political vulnerability, and bureaucratic fusion. First, I measure the value of institutional design favorable to PIM using two indicators. One comes from secondary sources which evaluate the effectiveness of the irrigation agencies in implementation of PIM and encouragement of WUO. As my main dependent variable is the existence of institutions for co-management of irrigation resources, I seek for evaluations as to whether water user organizations in the concerned countries became more effective following policy reforms. These evaluations come from sources like the World Bank, the Asia Development Bank, the International Water Management Institute, and the UN's Food and Agriculture Organization. I also look at scholarly articles regarding WUO found in my case studies. If these sources rate WUO and PIM as effective in the country, my value on the dependent variable is positive. The reverse is also true.

The second indicator is the existence and implementation of laws which empower WUO. This is measured by whether or not water user organizations are granted water rights as well as the legal authority to distribute water and punish defectors. I also look at whether or not WUO are given any formal method for punishing local irrigation officials for poor performance.

These two indicators are used to determine whether or not initiated reforms actually accomplish their goals. Grindle and Thomas define reform as, “deliberate efforts on the part of government to redress perceived errors in prior and existing policy and institutional arrangements.”[79] If, through the political process, the reform initiative is

79 Grindle and Thomas 1991, 4.

rendered toothless, it is not considered successful.[80] For example, if a policy reform is initiated with the stated intent to develop water user organizations that are responsible for operations and maintenance as well as water management, but the reforms do not include legally empowering the organizations, it is considered a half-hearted or stalled reform.

Political vulnerability at this level affects national politicians, primarily the head of state. It is assessed through a number of indicators including increasing demand for agricultural production and domestic pressures. I look for food security concerns, expressed by both rice imports and statements made by politicians. I also look at the capacity for rural groups to threaten the government through massive protests or a political party, such as the Communist Party.[81] Also, as noted above, I look at the bargaining power of international donors. Under economic crisis conditions, their bargaining power can force governments to accept PIM policy and reforms in return for aid. Politician and government officials' statements should also indicate their perceptions of vulnerability, thus interviews, biographies, and media reports are vital to supplement secondary sources and triangulate the value of this variable.

Bureaucratic fusion can act through a few mechanisms, which my measures must address. One possible path is through bureaucratic intransigence or inertia. In this case, reforms do not take place because the bureaucracy is able to ignore or avoid implementing policy handed down from politicians. In other words, there is little monitoring and enforcement exercised by politicians. A second path is when main policy

80 See Grindle 2004.

81 In all four of these countries, the Communist Party was perceived as a threat to the state. The party, in each case, was primarily a rural organization that relied heavily on farmer support.

makers are themselves career bureaucrats. In such cases, bureaucrats may be appointed to political positions, such as in a dictatorship wherein top-level bureaucrats also hold positions in the legislative or advisory body. A third path occurs when political parties treat a ministry as a prize or bargaining piece. These ministries are only valuable when their access to finances is secure, thus politicians preserve them to protect political interests.

To cover these possible paths, I use four main indicators to assess bureaucratic fusion. First, I measure whether or not bureaucrats are held responsible to the legislature by identifying whether or not legislative inquiries occur. Second, I assess whether or not top-level bureaucrats change when governments change and whether they are politicians. Third, I check the career path of politicians. If the bureaucracy feeds into political office, it is more likely that bureaucratic fusion exists. Finally, I look for evidence of bureaucratic purges in which bureaucrats, including top-level officials, have been displaced when they were unresponsive to politician demands. Such purges indicate that the bureaucracy is subservient to politicians, thus fusion does not exist. The preliminary list of indicators for each of my variables is found in Figure 2.5.

I treat both political vulnerability and bureaucratic fusion as exogenous variables; I don't seek to explain where they came from. The reasoning behind this stance for political vulnerability is discussed above. For bureaucratic fusion, the arrangements by which top-level bureaucrats are able to influence policy are often in place long before the question of institutional reform is on the table[82]

82 Heredia and Schneider 2003.

Figure 2.5: National Level Variable Indicators

	Indicators
DV: Nation-wide Institutional Reform	1) Positive evaluations of Water User Organizations by external evaluators (World Bank, Asia Development Bank, International Water Management Institute, researchers) 2) Legal Framework for Participatory Irrigation Management
IV: Political Vulnerability to Irrigation Policy	1) Politician Statements Regarding Rural Groups 2) Food Security Concerns or Demand for Increased Ag Production 3) Rural Protests or Growing Threat of Communist Party 4) International Donor Bargaining Capacity
IV: Bureaucratic Fusion	1) Lack of legislative inquiries into bureaucratic actions 2) Lack of top-level bureaucratic change across governments 3) Career path of top political leaders is through bureaucracy 4) Absence of prior bureaucratic purges

Much of this nation-level analysis relies on secondary sources, but I also employ primary sources especially in the case of Thailand and Indonesia. I accessed archive materials, newspapers, and project reports in order to code the independent variables. I also conducted interviews with policy experts, researchers, and officials knowledgeable about irrigation in Thailand and Indonesia. The analysis of Taiwan and the Philippines are based almost entirely on secondary sources.[83] Both countries have long been heralded as examples of irrigation management, resulting in a voluminous literature investigating both the institutional design and the context which gave rise to those designs.[84]

Comparing Sub-national Units

Currently Thailand and Indonesia fit within the subset of countries which have implemented policies short of national institutional reform. Although previously the

83 It is important to note that these two countries will be treated as full cases and will face the same rigorous evaluation as Thailand and Indonesia at the national level.

84 e.g. Lam 1996; Araral 2006.

bureaucracy was fused with policy makers, changes in the 1990s have weakened bureaucratic dominance.[85] Changes within national water policy have created sub-national variation in the implementation of formal rules and organizations for participatory management policies. By taking advantage of this variation, I test my sub-national hypotheses found above.

Sub-national comparisons grant me the advantage of being able to control for a large number of contextual variables, including national politics, culture, environment, etc., while still capturing variation on political vulnerability across neighboring areas. It allows me to employ what some have termed "natural experiments."[86] Also by comparing sub-national units between countries, I am able to overcome the specificity of a single country research design.[87]

Mirroring the national comparison, I employ Mill's methods of comparison to provide variation on institutional design, bureaucratic and farmer incentives, and participatory outcomes. I also use process-tracing of a series of water user groups to understand the causal sequence and gain a greater understanding of the preferences of the actors involved.

The unit of analysis at the sub-national level is the lowest level of government which maintains authority over implementing irrigation policy regarding participatory management. Again, the main outcome I am seeking to explain is the existence of effective water user organizations (WUO), which work with the local government. Under ideal conditions, they are headed by a farmer volunteer who organizes and administers

85 Riggs 1966; Bidhya 2001; Suhardiman 2008.
86 Diamond and Robinson 2010.
87 Snyder 2001.

water allocation decisions. Their responsibilities are often located at the tertiary (most local) level but may extend into secondary and even primary canals.

In order to investigate the causes by which effective WUO emerge, I need to focus on the level of local government charged with authority over implementing participatory irrigation policy, including control of local bureaucrats. In Indonesia this is the district (*kabupaten*) level government. Currently there are 405 districts in Indonesia.[88] In Thailand authority is shared between the central government and the province, with provincial irrigation offices being in charge of authority for PIM implementation. Even so, differences can be found between sub-districts and between districts due to the fact that irrigation catchments often cross political boundaries. Thus research in Thailand had to include multiple administrative levels and was more specific to the WUO.

I chose cases by their value on the dependent variable: the existence of institutions for PIM, or effective WUO, within their boundaries. Unfortunately, evaluations of WUO in both Thailand and Indonesia are poor.

Using recommendations from local researchers and the irrigation agencies, I visited a number of WUO and evaluated their PIM institutions based a uniform set of criteria. First I relied on statements by the local irrigation officials as to whether or not they view the group as effective. If available, I also questioned local researchers for their evaluation of the water user group in question. I then collected data on water user group funding, conflict management, and water distribution. If the water user group collected water fees from over 70 percent of its members, diffused farmer conflict without relying on the irrigation agency, and farmer volunteers distributed water on their own, the group

88 The number of districts in Indonesia has fluctuated a great deal since the fall of Suharto in 1998.

was considered successful. As a final check, I also posed some basic questions to farmer group leaders to check whether or not they actually bore some responsibility for their group.[89]

According to these evaluations, I developed a series of case studies comparing effective and less-effective WUO which have emerged under the sub-national government authority. By tracing the process through which these groups emerged, I parsed out the role of multiple inputs and their effect on the group. These case studies were then used to create comparisons between sub-national governments, identifying some sub-national governments which have been successful at encouraging PIM management institutions and some which have not.

My theory predicts that those units which have successful PIM should have experienced high levels of political vulnerability and low levels of bureaucratic fusion prior to the establishment of the institutions.

My evaluation of political vulnerability at the local level relied on indicators such as whether or not competitive local elections are held in at the sub-national level of government in question, whether or not local the sub-national government faced resource limits in staffing or budget, whether or not local farmers were organized into bodies which pressured politicians for acknowledgment, the length of time and community ties politicians had to the area, and statements by officials and politicians regarding their feelings about irrigation and agriculture promotion.

I evaluated bureaucratic fusion at the local level according to a number of

89 These included questions about how many water users were in the group, what the irrigated area included, crop patterns, and basic rights of water users.

indicators. The first, and most important, indicator was whether or not local political officers are elected or appointed by the central government. If appointed, this means that they are bureaucrats, and bureaucratic fusion most likely exists.

Beyond this primary indicator, I also looked at whether or not local politicians held sway over project decisions, whether or not bureaucratic salaries were controlled by the local government or the central government, and statements by leaders and officials regarding their relationship. Figure 2.6 provides a list of these indicators for all three variables of interest.

Figure 2.6: Sub-National Variable Indicators

	Positive Indicators
DV: Local Participatory Institutions	1) WUO engage in the following activities (from Figure 2.1): • Information Transfers between Farmers and Officials • Take part in Operations and Maintenance • Manage Water Distribution at local level • Collect Water Fees • Manage Water Conflicts • Develop Yearly Water Plans 2) Farmer Volunteers Act in Management Roles 3) Officials Consult with and Delegate Responsibilities to WUO
IV: Political Vulnerability	1) Local Political Competition 2) Bureaucratic Resource Limits 3) Existence of indigenous farmer organizations 4) Ties to the community 5) Statements by local politicians regarding the pressure they face
IV: Bureaucratic Fusion	1) Local political leaders are appointed rather than elected 2) Local political leaders rely on bureaucrats for approval of policies and projects 3) Bureaucratic salary is distributed by the central offices rather than local governments 4) Statements by local politicians and bureaucrats regarding their relationship with one another

Using these indicators, bureaucratic fusion was not present at the district level in Indonesia, while it was present at most administrative levels in Thailand. Further details are provided in the respective chapters.

Importantly, this variation provides ample opportunity to further test my arguments about political vulnerability and bureaucratic fusion. In Thailand, where bureaucratic fusion is consistently high at the local level, the existence of variation in PIM indicated that bureaucratic fusion, at least at the local level, does not always mean that institutional development will not happen under conditions of high bureaucratic control over local policy. Thus, I was able to identify a set of alternative variables which allowed policy actors at the local level to overcome problems of bureaucratic fusion.

In Indonesia, where I was able to hold low bureaucratic fusion constant, I was able to focus on the effect of political vulnerability. Thus, I was able to identify better the conditions under which local politicians would pay the high cost of institutional development that came from policy creation and implementation, especially the cost of monitoring the bureaucracy.

For both national and local levels, I collected data from a number of sources. First, I conducted semi-structured open-ended interviews with local and national officials, researchers, politicians, and leaders of farmer groups. I asked questions about what each perceived to be the most important issues as hand, why they did or did not concentrate efforts on irrigation, and where pressures come from for changes. This work included over 70 primary interviews in Indonesia conducted in July, 2009 and over a ten-month period, January through early November, 2011. In Thailand I conducted over 50 primary

interviews in June and August, 2009 and a six-month period, January through July, 2012. In both countries I also used participant observation in a number water user group and irrigation agency meetings.

From both local and central government offices, I gathered data regarding budget and staffing problems facing bureaucrats and how those affected their relationship with farmers. This information was supplemented with data from project reports, meeting minutes, and local media sources. Because of the danger of bias in respondents, I used numerous sources to triangulate support my findings.

The remainder of this dissertation explains how this research design was carried out and interprets the data which was collected. The next chapter discusses the national-level comparisons, while Chapter Four and Chapter Five analyze the sub-national comparisons found in Indonesia and Thailand respectively. The final chapter summarizes my findings, evaluates the theory in light of the data, and concludes the work.

Chapter 3

National Level Analysis

Introduction

In a 1997 report for the World Bank, Edward Rice wrote that the then-accepted wisdom was, "With few exceptions, [Operations and Maintenance] performance by both agencies and irrigators on the large, government-operated, gravity-fed irrigation schemes in Southeast Asia is dismal."[1] In the 15 years since, not much has changed. Institutions necessary for effective farmer participation in operations and maintenance, namely effective water user organizations (WUO), are largely missing from many irrigation schemes.[2] This criticism comes despite years of international investment into the infrastructure and management of irrigation in Southeast Asian countries.

At approximately the same time, Taiwan's irrigation systems were being praised for their effectiveness. This was, in large part, due to the institutional design of irrigation associations wherein farmers work in close cooperation with irrigation officials to operate and maintain irrigation systems. These institutions had been in development since the 1950s.[3]

The existence of water user organizations serves a number of purposes that potentially increase the effectiveness of water resource management. The international

1 Rice 1997, 1. Rice went on to challenge this claim, arguing that experts should be more open to recognizing sporadic operations and maintenance rather than the type generally proscribed by the international community.

2 Molle, Nittaya, Saovakon 2002; Bruns 2004. See also the recent poor performance of Irrigation Associations in the Philippines. Araral 2005.

3 Moore 1989, Lam 1996.

donor community, promoting irrigation management transfer, has argued that these institutions help (1) increase service provision and responsiveness, (2) increase the efficiency and effectiveness of irrigation, and (3) reduce costs for government management.[4] Other benefits include increased information transfers between the irrigation bureaucracy and farmers, coordination of cropping patterns, farmer-managed conflict resolution, and better management of water resources. While experts do question some of these points, there is a general consensus that active water user organizations are beneficial for irrigation agencies and increase the efficacy of water management.

This dissertation, along with a preponderance of the literature on irrigation management, accepts the premise that water user organizations positively influence irrigation management. The further question then emerges: Why do some countries, like Taiwan, experience success in promoting these groups while others, like Thailand, struggle to concoct the proper policy recipe?

We know that certain policy components are necessary for WUO to emerge. Ostrom laid out eight design principles necessary for self-governance of water systems: (1) Clearly designed boundaries; (2) Proportional equivalence between benefits and costs; (3) Collective choice arrangements; (4) Monitoring; (5) Graduated sanctions; (6) Conflict resolution mechanisms; (7) Minimal recognition of rights to organize; and (8) Nested Enterprises.[5] These principles focus on the dynamics within the group, but in order for these to emerge, the state has to build an institutional framework which encourages these principles, including irrigation agency reforms. One group of experts state, “PIM without

4 Vermillion 1997.
5 Ostrom 1992.

commensurate changes in the incentive structures of the irrigation bureaucracy is not likely to work."[6] At the bare minimum, effective water user organizations require an institutional framework that gives them legal status and capacity to monitor and enforce their own rules.

The emergence of such a framework depends on the policies and rules governments espouse regarding farmer participation in water management. Irrigation agencies must be favorable to participation, and officials must face real consequences if they do not work with farmers.

This chapter focuses on the macro-institutions for participatory irrigation management. Through comparing four countries that have experienced varying degrees of success developing cooperation between the state irrigation agency and water users, I demonstrate that the emergence of such a policy framework is dependent on threats that politicians face and the policy role of the irrigation agency.

As discussed in Chapter Two, I chose cases according to international perception on their value on my dependent variable, the nation-wide existence of institutions for WUO. Once these cases were chosen, I conducted deeper analysis of their values on the dependent variable across time, beginning shortly after the end of World War Two[7] through the present.

I evaluated their values on the dependent variable according to two criteria set out in Chapter Two: (1) Evaluations of WUO on a national level conducted by experts and (2) The degree to which policy reform is favorable to water user organizations. External

6 Mukherji et al 2012, 435.

7 The Philippines, Indonesia, and Taiwan all became independent countries shortly after the end of World War Two. Thailand had previously been independent, but had been heavily influenced by colonial powers.

evaluations are relatively straightforward. These come from secondary sources, including World Bank, FAO, and Asia Development Bank reports as well as scholarly papers on the subject.

Policy reforms require more specific indicators. A successful policy reform reflects that which Grindle defined in reference to successful education reforms in Latin America:[8]

> the extent to which a reform initiative survived approval and implementation and the extent to which it was sustained over time without sacrificing its original objectives. This allows for the fact that the dynamics of approval and implementation can alter the content of policies through negotiation, improved technical analysis, and variable management capacity, but rules out experiences in which reforms are so watered down by such interactions that they cease to embody significant change.

Thus I am measuring reform efforts according to the degree which a law or regulation actually provides some favorable rule toward the establishment and empowerment of water user organizations. More concretely, laws are evaluated according to whether or not they give legal standing to the water user organization, grant them water rights, and provide the WUO the capacity to punish defection from their groups. I also look for a formal mechanism by which water users are able to express their displeasure toward the irrigation agency, such as a legally binding contract. Such a legal framework should result in the creation of water user organizations assigned responsibilities over water management and distribution and that work in conjunction with irrigation department

8 Grindle 2004, 16.

officials.

The combined measure of policy framework and external evaluations provides a measure of my dependent variable: the existence of nation-wide institutions for participatory irrigation management.

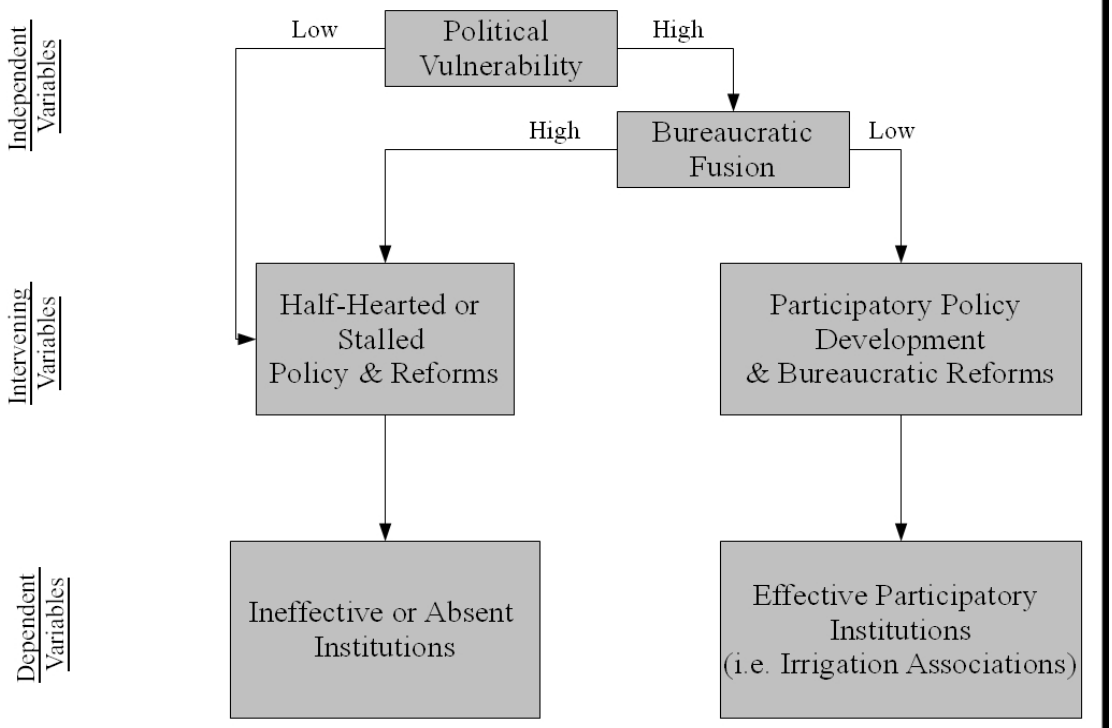
I argue that the necessary policy framework and implementation emerges out of the political situation of the country.[9] Constructing the institutional framework necessary for effective water user organizations to emerge is difficult and costs time. Politicians will only get involved when they face some sort of *political vulnerability* in irrigation policy. Otherwise they prefer to let the status-quo manage itself.[10] Unfortunately such vulnerability is relatively rare.

Added to the situation is the position of the irrigation bureaucracy. If the irrigation bureaucracy is able to control the policy-making process,[11] then it will raise the cost of developing and implementing a proper policy framework. Many bureaucracies have a system of perverse incentives which encourage them to focus on construction and expansion rather than promoting public participation in operations and maintenance.[12] If these bureaucracies exercise control over irrigation policy, in other words if a high degree of *bureaucratic fusion* exists, the bureaucracy will prevent necessary reforms from emerging.

The effect of these two variables, *political vulnerability* and *bureaucratic fusion*, is detailed in the hypotheses set forth in Chapter Two. Figure 3.1 provides a graphic of the theoretical predictions.

9 The politics of irrigation reform can be quite contentious, upsetting long-held interests. See Wade 1984.
10 Grindle and Thomas 1991.
11 See Chapter Two. Also, Heredia and Schneider 2003.
12 See sources cited in Chapter Two. For specific issues regarding irrigation see Repetto 1986.

Figure 3.1: Theory of Institution Creation



These predictions are tested across four Asian countries which share similar characteristics in crop cultivation (primarily small-scale rice planting), climate (generally tropical with an abundance of water concentrated during a single season), and what was once a similar level of economic development. Further justification of these cases can be found in Chapter Two.

The remainder of this chapter is divided into six sections. First, I provide a basic introduction to the shape and function of water user organizations. Then I lay out the four country cases and their irrigation policy history. I order my cases according to the level of success they each have with PIM. Taiwan's experience is perhaps the closest to an ideal type. The Philippines follows with the success it experienced during the 1970s and 1980s in irrigation reforms. Indonesia and Thailand present unsuccessful attempts at developing

and implementing policy for collaboration between irrigation agencies and farmers.

The analysis begins in approximately 1950, although a short background history is provided for context. In each case, I use historical process-tracing to outline the development of the country's policy framework toward irrigation, ensuring that the causal process occurs in the sequence that my theory asserts. Using historical process tracing also allows me to test for alternative explanations as well as check the causal chain.

After each historical narrative, I detail the coding of my three main variables of interest, the existence of WUO, political vulnerability, and bureaucratic fusion. I discuss how political vulnerability and bureaucratic fusion interact to produce the policy framework shaping water user organizations. This allows me to evaluate my theory for each case. At the end of the chapter I draw the cases together in a comparative analysis.

The Basic Shape of Participatory Irrigation Management

The most basic definition of a water user organization is fairly simple: a group of water users who cooperate to attain a goal. The primary goal of a water user organization is the coordination of water management, including the tasks necessary for operations and maintenance of an irrigation system. Chapter Two includes a deeper discussion of the specifics involved.

While each country has distinct names for their water user organizations, the associations come in some basic shapes. At the tertiary or lower level, the most local canals, are basic water user groups. These organizations are often quite small, from only a few farmers to dozens. Rarely do these groups include more than 100 farmers. The next level up is at the secondary canal. Here a number of basic water user groups combine to

become an integrated water user group. These organizations should coordinate water distribution at the secondary canal level. The next level up is charged with a primary water turnout, usually involving an entire canal system. At this level it is rare that water users have the capacity to manage the system alone. These organizations ideally would include both water users and irrigation officials. Infrastructure and technical requirements at this level require skills and resources that farmers often do not have. Figure 3.2 provides a schematic of these levels. The entire area pictured would be under the control of the combined group of two or more Integrated Water User Organizations.

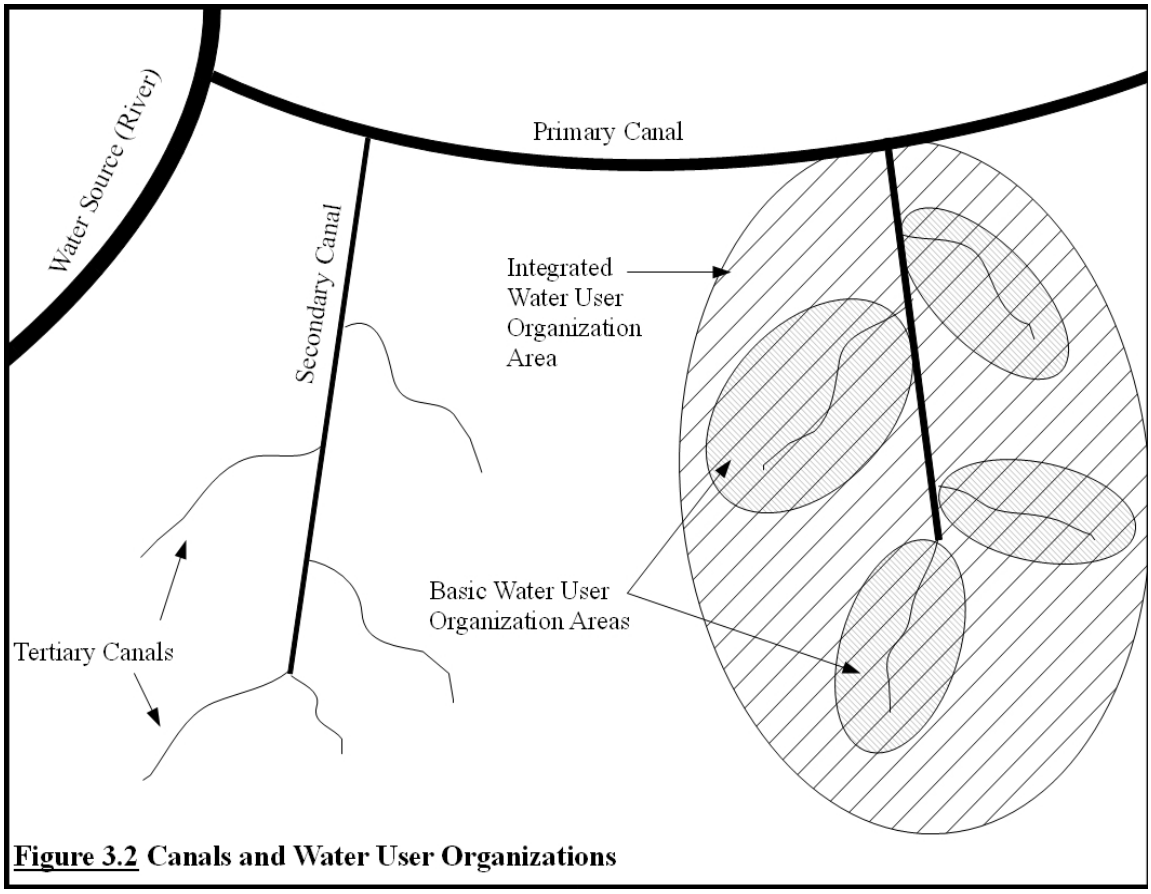
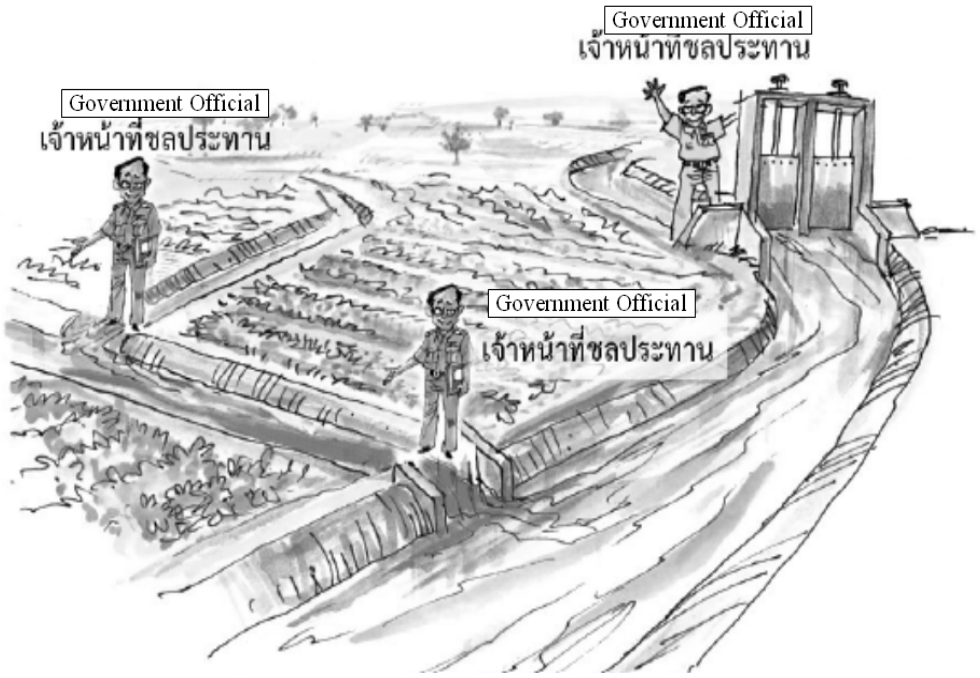


Figure 3.2 Canals and Water User Organizations

In a traditional developing country irrigation management system, the irrigation agency would be involved at every level. Water user organizations at all levels would be

generally unnecessary as the irrigation officials would be responsible for water distribution all the way from the first water turnout to the tertiary and even fourth-level canals. Such management is extremely costly in both time and resources, as officials have to manage and monitor the entire length of the canal. In the ideal PIM system, farmers would be involved at each level, both for management and monitoring. The Thailand Royal Irrigation Department has prepared graphics to illustrate the differences between these two extremes.[13]

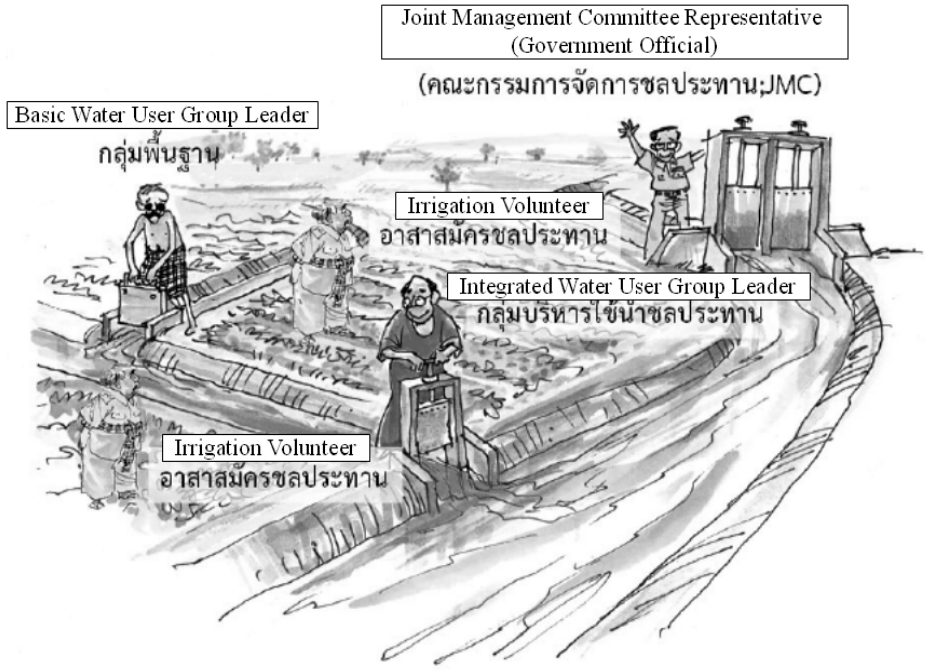
Figure 3.3: Government Managed Irrigation



Source: Courtesy the Royal Irrigation Department, Bangkok Thailand

13 Figures 3.3 and 3.4 are used with permission from the Office of Public Participation Promotion of the Royal Irrigation Department of Thailand. Originals can be found in Office of Public Participation Promotion 2011, pages 11 and 18.

Figure 3.4: Participatory Irrigation Management



Source: Courtesy the Royal Irrigation Department, Bangkok Thailand

The four country studies which follow have a number of different terms for each of these levels. Table 3.1 provides the names of these organizations to facilitate ease in comparison.[14]

Table 3.1: Water User Organization Titles

	Taiwan	The Philippines	Indonesia	Thailand
Tertiary Level	Irrigation Team	Turnout Service Areas (TSA)	Water User Group (P3A)	Water User Group
Secondary Level	Irrigation Group		Integrated Water User Group (GP3A)	Integrated Water User Group
Primary Level	Irrigation Association	Irrigation Association	Major Water User Group (IP3A)	(1) Water User Association (2) Joint Management Committee

14 These names are translations are from each country's irrigation agency.

As mentioned previously, a shift from complete agency management to water user management requires a number of policy reforms as well as changes in bureaucratic procedure which empower water user organizations. Throughout the next four sections, I elaborate on my four country case studies. I begin with Taiwan and the Philippines, two countries which have developed national policy reforms for PIM. I then turn to Indonesia and Thailand, which have both struggled to incorporate water user participation.

Country Study – Taiwan

Topography shapes irrigation. In Taiwan, sharp inclines from the ocean to the mountains create short, rapidly flowing rivers. Rainfall is generally abundant but concentrated largely in a single season with 80 percent of the yearly total falling between June and October, which can turn relatively small streams into raging rivers. Due to these conditions, irrigation management is vital for rice paddy production, especially during the dry season.

Prior to the 1900s, irrigation on the island was relatively simple.[15] Farmers built semi-permanent structures for water storage and management, but there was little in the way of infrastructure development aside from some Dutch projects for sugar production and farmer-developed irrigation systems under the Ching Dynatsy's supervision. Paddy and sugar cane competed for farmer interest, but as the population grew and rice became more profitable, most land was converted to paddy production.

After the Japanese colonized the island in 1896, they began major projects for irrigation expansion. Beginning with an intensive mapping effort, the Japanese colonial government began a series of farmland development projects. The government had a goal

15 Much of this history comes from Department of Irrigation and Engineering N.D.

of agricultural extraction for the island, one part of which was the development of irrigation systems. They developed reservoirs and canals, with the goal of irrigating approximately 600,000 hectares (1,482,632 acres). By 1942 they had almost accomplished that goal with a total irrigated area of 560,000 hectares (1,383,790 acres), or about 69% of all arable land.

The Japanese colonials also established water user organizations called Irrigation Cooperatives. The head of these cooperatives was a government appointee, and he did not necessarily have to come from among the membership. The staff came from government officials. These organizations existed primarily to ensure efficiency in irrigation management.

The War in the Pacific took a heavy toll on the irrigation infrastructure of the island. No systems were left untouched, and the irrigated area on the island dropped to less than half its previous coverage at 260,000 hectares (642,473 acres). After the war, the Republic of China took control of the island. The Irrigation Cooperatives were reorganized as Irrigation Coordination Associations, and the government turned to rehabilitating the damaged facilities from the war in order to ensure a food supply for the island's inhabitants. In 1948 the organizations were reorganized again into 40 Irrigation Committees. These were still civil organizations, with some leaders elected and others appointed by government. This arrangement did not last for long, as the importance of irrigation on the island was about to change.

In 1949 the Kuomintang (KMT) government fled the mainland and established itself on Taiwan. With the inauguration of the People's Republic of China and the KMT

loss on the mainland, the Republic of China government knew that it was in a vulnerable situation. The fear that the civil war would follow them across the strait encouraged a strong government focus on food production, especially in rice. Food security became imperative.[16]

During the first years of KMT rule, the government focused on infrastructure development and land reform to achieve its food security goals, but when a drought hit in 1954, the government recognized the importance of managing and coordinating irrigation resources.[17] In response, the KMT turned to the Irrigation Committees, which were remnants from the Japanese colonial era.[18] The KMT issued the Regulation on Taiwan's Irrigation Committees Improvement followed by the Organizational Regulation on Taiwan's Irrigation Associations. The existing irrigation management structures were reorganized into 26 Irrigation Associations (IA). These new groups enjoyed a legal status that made them para-statal, in other words they became state agencies with the power to raise their own funds through irrigation fees.

Under these regulations, farmers who own land within the irrigation area automatically become members of the association and are obligated to pay fees. The irrigation officials who work within the IA are responsible to work closely with farmers, as part of the funding for the agency comes through fee payment.[19] Thus there was an economic logic applied in the organizations. Beyond this, the IA were established with a

16 Williams 1994, Lam 2006.
17 Botrall 1977.
18 Lam 2006.
19 Botrall 1977. Stavis (1974) found that about half of an IA's budget came from farmer irrigation fees. Moore (1989) argues that the actual threat of farmers not paying fees does not come from the loss of funds. Instead it serves as a monitoring mechanism from the central agency to see whether or not the IA are responsive to farmer needs. This innovation, though, came about in 1975.

great deal of autonomy and flexibility, which was necessary in creating a responsive agency.[20]

The Irrigation Associations quickly began to function and were soon praised for their effectiveness,[21] but their institutional development was not yet complete. As time passed, circumstances surrounding the IA also changed, but the issue of food security remained important for the KMT government. The ruling party kept a watchful eye trained on maintaining the irrigation associations' effectiveness.[22] Due to the organizations' para-statal nature, the potential for collusion and corruption outside of government oversight was a real possibility. By 1975, a number of complaints began emerging that local politicians and long term staff were taking advantage of the IA's access to resources. Farmer dissatisfaction was expressed through non-payment of fees. Again the KMT felt concern that rural communities may turn against the government, especially since the head of each IA was a KMT member. That concern was coupled with two other pressures. First, Taiwan was forced to return to a reliance on rice imports in the early 1970s, which threatened the KMT's continuing preoccupation with food security. Second, the United States' increasing engagement with mainland China exacerbated the pressure felt by the Taiwan government to return to rice self-sufficiency and quell disunity in rural groups.

In response, the central government embarked on another round of institutional changes to encourage the their effectiveness. The government placed the IA organizations under the supervision of the Provincial Water Conservancy Bureau. Recognizing that

20 Lam 1996; See also Pritchett and Woolcock 2004.
21 Abel 1975.
22 Lam 2006.

farmers were expressing dissatisfaction through non-payment of water fees, the central agency decided to use that as a monitoring mechanism for the officials within the IA. The para-statal nature of the IA meant that they relied heavily on government subsidies to pay staff salaries and fund construction, despite the fact that part of the budget came from water fees. This gave the government leverage over officials in the system. The government required reports on the speed of water user fee payment each year, and it partly based decisions on salary increases and promotions for officials on these. Thus a small number of farmers dissatisfied with the system could drag their feet on fee payment and create real implications for the local agency officials.[23] This method of oversight became one of the primary institutional mechanisms that forced officials to invest time and effort into the organizations; the mechanism lasted until the 1990s.

Beyond that institutional control on the groups, local irrigation plans and social links that the officials have with their neighbors play a major role in ensuring the effectiveness of the organization.[24] The street-level officials who are responsible for irrigation are tied closely to their irrigation district. Besides having clear responsibility for a specific area, they are also integrated into the community. The station chief, or head of the local office, lives in an apartment in the office where he is easily accessible by farmers and readily able to respond to emergencies as they arise. The local offices also have the autonomy to adapt management to the local situation. This autonomy is absolutely necessary for obtaining farmer trust and cooperation.

Currently there are 17 Irrigation Associations in Taiwan. Under them are a number

23 Moore 1989.
24 Lam 1996.

of Irrigation Groups, which are the basic water user groups established for farmer coordination at the local level. Every year the Irrigation Groups provide a cropping plan to the Irrigation Associations, which in turn approve water distribution for these plans and determine water management schedules. A system of water rights is allocated each year to these organizations, providing a sense of ownership for water allotment. These water rights, although dynamic from year to year, are considered the legal property of the group. For example, Irrigation Associations are able to sell their water to industry. The Irrigation Group is further divided into Irrigation Teams, which handle water distribution within an irrigation block. The Irrigation Group and Irrigation Team is where most of the water distribution occurs.[25] Farmers, up until the early 1990s, paid water user fees to both the Irrigation Association and to the Irrigation Group. Participation in the Irrigation Group also included contributions of voluntary labor.

Despite the relative success observed in participatory irrigation management, the policy framework shaping how the IA worked with farmers has changed over time, with the government occasionally revisiting the idea to nationalize irrigation management. This was attempted with legislation in 1993, which was repealed by follow-up legislation in 1996. The failure to nationalize the system was partly due to a recognition that it would create a massive increase in costs for the government as well as pose a major coordination dilemma as the bureaucracy would be forced to take a stronger hand in irrigation management.[26] In 1993, the government was able remove elections from the IA; leaders were to be appointed. In 2001, though, the appointment system was removed

25 For more detail about the functions of these organizations see Lam 1996.
26 Lam 2006.

and elections for presidents and commissioners of the IA returned. More recently, farmers have resisted efforts to increase government control over the organizations by again disbanding elections and appointing IA leadership.[27]

Another important change occurred in the early 1990s when the Taiwan government released farmers from paying any and all water fees for the operation and maintenance costs in their IA.[28] Suddenly the monitoring mechanism and control farmers had over the organizations was gone. Since that time, unfortunately, many of the basic irrigation groups, which function under the IA at the local level, have become inactive.[29] Despite this, the majority of the Irrigation Associations continue to function. Lam argues that this is partly due to path dependence.[30] Institutional frameworks which were established over the past 50 years are not easily displaced. The social relationships between farmers and IA officials still hold strong, despite a reduction in contributions of voluntary labor.

Currently, the role of the IA is still debated. The government, now paying all operations and maintenance costs, sees the organizations as existing in crisis and in need of reform. As irrigation groups have become inactive, those costs have increased, which in turn increase the impression among government leaders that reform is necessary. Even so, the "stickiness" or path-dependent nature of institutions contributes to their continued operation.

Taiwan Evaluation

27 Yu Ming-ching and Wang Chun-Chung. "Irrigation Groups Furious Over Calls to Abolish Elections." *Taipei Times* April 17, 2012, p. 3.
28 This measure was included in legislation in 1993, although it seems to have not been implemented fully until 1995. Ko 2002.
29 Lam 2005.
30 Lam 2006.

Despite some level of backtracking since the 1990s, the irrigation policy framework in Taiwan is favorable for participatory irrigation management. Legally, the water user organizations are granted both rights to water and to property, which the organizations own. While water plans shift from year to year, once the water is allocated to an IA or Irrigation Group, it is considered the organization's property and right. The government must compensate farmers when water rights are transferred from the water user groups to industry or urban uses. Beyond water rights, the IA also have legal status as a para-statal organization. They, for most of their history, hold elections for leadership and have the authority to monitor and punish farmers for water stealing. The policy framework is very amenable to participatory irrigation management.

Beyond these institutional structures, Taiwan's effectiveness in participatory irrigation management has long been praised by the international community. Irrigation under the control of the IA during the 1970s was extremely efficient, with canal schemes receiving efficiency ratings of as high as 90 percent.[31] The organizations were not merely efficient, they were also widely commended as models of participatory success.[32] Numerous irrigation agencies from around the developing world have sent their officials on study visits to Taiwan to learn more about PIM, and the Irrigation Associations are among the best studied water user groups in the world.

Due to these factors, I consider Taiwan to be a positive case of my variable of interest. It may be the country closest to the ideal type, as the institutions encouraging farmer participation are much more developed than the Philippines case discussed in

31 Levine 1977.
32 Botrall 1977; Moore 1989; Lam 1996.

detail below.[33] If my theory is correct, we should find evidence of political vulnerability which led to the development of these institutions in an absence of bureaucratic fusion.

As expected, policy actors in Taiwan experienced a high degree of political vulnerability in irrigation. When the KMT party fled from the mainland, their main concern was their literal and political survival. The KMT government saw war as "not only plausible but inevitable."[34] The threat was real and forced the party to pay special attention to national security, which included food security concerns.[35] They saw a secure supply of rice as vital to their own political survival and a key to increasing economic development. By first becoming self-sufficient, then becoming an exporter, politicians felt that they were providing some degree of security to their rule.[36] The production and eventual export of rice was a potential path for government survival and prosperity.

Rice production, though, relied on a stable water source. When a drought hit in 1954, the government realized that they could not merely rely on regular rains. At that point the government introduced rotational irrigation, which requires a high degree of institutional capacity.[37] This necessitated institutions for irrigation management and farmer participation. The expansion of irrigation included major construction projects as well, such as large reservoirs and lining canals with concrete.[38] These construction projects also required water user organizations to conduct operations and maintenance

33 It is important to note that Taiwan is a development success in many areas, not just irrigation management. From economic growth to healthcare, Taiwan is widely seen as one of the world's greatest development stories since the 1950s. Thus it is important to (1) trace the process through which PIM developed in Taiwan to identify the proximate causal factors and differentiate irrigation success from that of the entire country and (2) consider the case of the Philippines, which has had some PIM success with a relative lack of developmental success.

34 Lam 2006, 206.

35 Williams 1994. See also Woo-Cummings 1998.

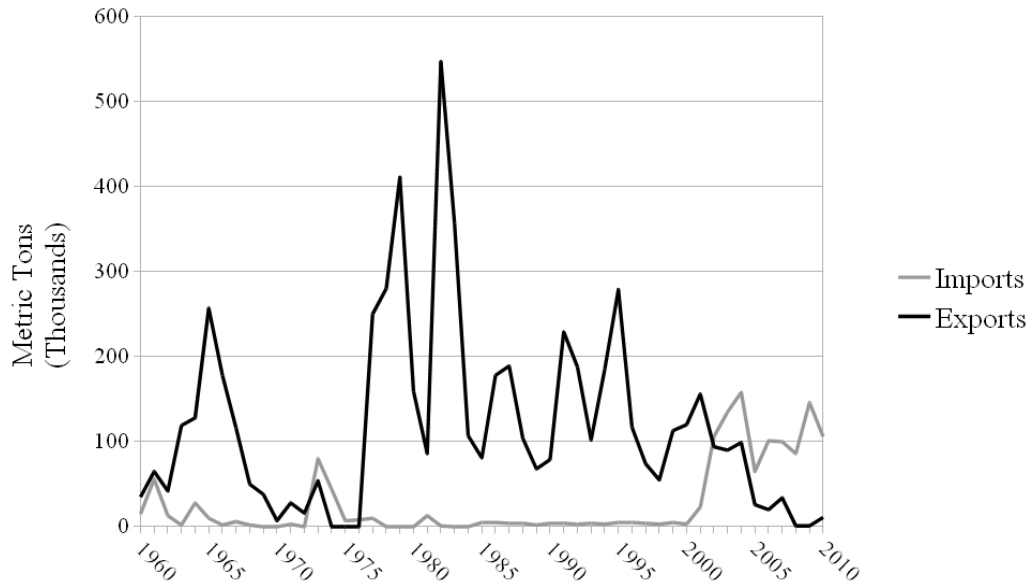
36 See Doner, Ritchie, and Slater 2005.

37 Botrall 1977.

38 Ko 2002.

tasks. By 1960, Taiwan was exporting rice, which became a major source of revenue for the country. Figure 3.5 shows rice imports and exports for the country.

Figure 3.5: Taiwan Rice Imports and Exports



Source: USDA Foreign Agricultural Service

Beyond increasing rice production for both food security and for export, the KMT was very interested in preventing the spread of Communism into the countryside as had happened on the mainland. In order to hinder the threat, the government saw a multiple uses for the Irrigation Associations.[39] Not only could they increase efficiency of water management, they could also tie the rural population to the KMT.[40] Leaders of the IA were generally members of the KMT, and they connected the organizations to the party structure.

39 Stavis 1974.
40 Bosco 1992.

By the 1970s, the reliance on agriculture had diminished, but officials still expressed concern that production would keep up with demand and that the IA continue to promote a positive relationship between farmers and the government. Rice and sugar cane became important exports, with rice relying most heavily on irrigation. Rice exports, though, dropped, and in the early 1970s the island had to again rely on imports. Political vulnerability in irrigation again threatened.

At the same time concerns emerged that the IA were becoming a hotbed of corruption; farmers began to protest by avoiding fee payment. The prospect of rural unrest concerned the KMT, which resulted in further institutional reforms occurring in 1975. With a rice deficit and American involvement with mainland China highlighting an external security threat, the government considered nationalizing the irrigation system but refrained due to concerns over increased cost. Instead the government opted for greater monitoring of the organizations through reports of water user fee payment in order to increase water management efficiency. As noted above, this resulted in regular evaluations for irrigation association officials based on farmer satisfaction, which strengthened their incentives to work with farmer groups.

During the 1970s and 1980s, the place of agriculture in Taiwan's economy began to shift. Industrialization caused urban centers to far outpace rural areas in economic development. Also, the price of rice fell due to increases in the supply both domestically and globally, so the government turned to subsidization. The KMT government still felt that food security was vital to their political survival and national security. Rice prices were guaranteed, and an increase in government promotion of agriculture reached into

zoning laws, subsidies, and rural infrastructure, including irrigation.[41]

By the early 1990s, though, much of the concern for rice production had passed, and with it political vulnerability in the irrigation sector. In fact, by the 1980s an oversupply of rice increased costs on the government. The government, which had spent so much time and effort to ensure a stable food supply, turned to promoting paddy fallowing programs to reduce rice production.[42] While the government remained concerned with maintaining the capacity for food self-sufficiency due to the external security threat posed by mainland China, it is well assured that the island can produce more than enough rice for itself.

Also in the late 1980s and early 1990s, the country transitioned to democratic rule and the KMT had to face the real threat of an alternate party in elections, the Democratic Progressive Party (DPP). Both parties turned to agriculture and irrigation to try and win the support of farmers. The Irrigation Associations became important potential voting blocks for politicians. When a proposal for the government to pay irrigation fees of farmers came forward, neither party wanted to be labeled as anti-farmer, despite concerns expressed by irrigation officials about the possible negative effects of the policy. [43] Competition between the KMT and the DPP have led politicians to try and please the farmers in the irrigation associations, which has unintended consequences for the role of the organizations.[44] The politics of agriculture sector pork in a time of plenty began to chip away at the participatory institutions built over the past 40 years.

Thus, I consider political vulnerability to be high from the arrival of the KMT

41 Lam 2005.
42 Ko 2002.
43 Lam 2005.
44 Lam 2001.

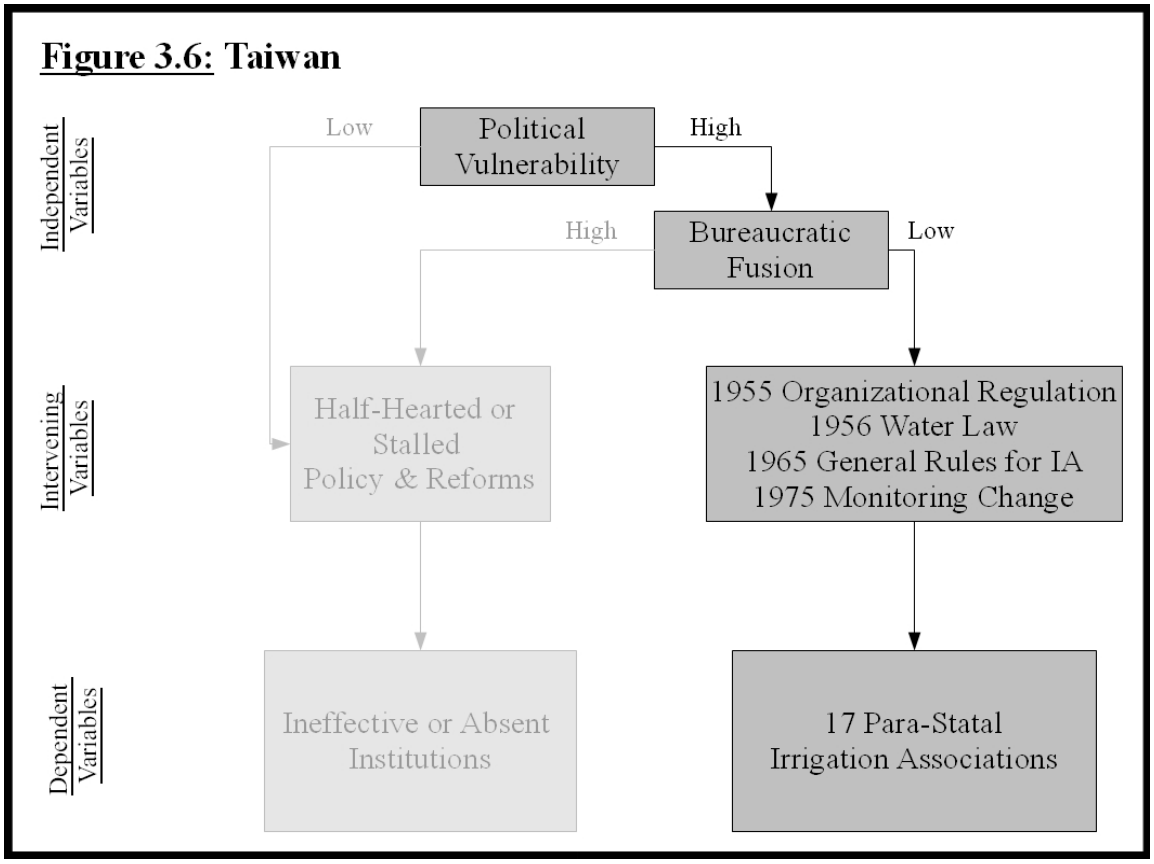
government in 1949 through the transition to democracy in the late 1980s. Beginning in the mid to late 1980s, the rice surpluses on the island, combined with the more open policies of Deng Xiaoping of the People's Republic of China, reduced political vulnerability based on food security. After that time, politicians became more vulnerable on other issues. Irrigation became a political tool for obtaining votes rather than a tool for attaining self-sufficiency and national security. As evidence of a decreased concern for self-sufficiency, the ratio of rice exports to imports decreased, and by the early 2000s, Taiwan became a net rice importer.

Bureaucratic fusion was generally low in Taiwan. When the KMT took over administration of the island in 1949, the irrigation agency was practically non-existent. The Japanese colonial power had developed irrigation groups, but they were relatively weak in order to prevent them becoming a threat to the colonial rule. What infrastructure and bureaucratic structures did exist were decimated by the war. The KMT was able to develop irrigation policy independent of an entrenched bureaucracy.

As time passed, the IA, as a para-statal series of agencies, remained solidly under politician control. The Provincial Water Conservancy Bureau, which oversees the Irrigation Associations, is charged with forming and implementing water policies, but the agency is separate from the implementers found in the IA. The Council of Agriculture is the national agency which overseas IA, and it is the source of subsidies for farmers who fallow their land or for IA budgets. The fragmented nature of the agencies involved prevents major vested interests at the top levels of the bureaucracy from attempting to wrest policy control from the hands of politicians. In fact, when politicians decided to

abolish irrigation fees for farmers, top level bureaucrats who knew that the fees were important for the functioning of the IA were powerless to oppose the measure. They were only able to voice concern but not stop the policy.[45] Recognizing the initial lack of an agency, the fragmented nature of control over the Irrigation Associations, the degree of political oversight exercised over irrigation, and the lack of influence officials in the Irrigation Associations have over policy, I evaluate bureaucratic fusion as low.

The case is presented in the theoretical framework in Figure 3.6.



The figure, and my analysis, does not include the changes which have happened since 1990. While I am of the opinion that the changes in irrigation fee payment have had a detrimental effect on the policy framework for participatory irrigation management in

45 Lam 2005.

Taiwan, the path-dependent nature of institutions preserves their effectiveness, at least for the present.[46]

My theory does provide some explanation for these recent changes. As political vulnerability on irrigation has decreased, the government's focus on monitoring and maintaining the institutions necessary for the functioning of water user organizations has diminished. Because of this, we should expect a decrease in PIM performance, as observed.

Country Study – Philippines

Irrigation in the Philippines began long before the islands were colonized by the Spanish.[47] In the northern mountains, communities built rice terraces, and in the lowlands farmers developed simple temporary dams and canals. Spanish colonizers arrived in the 16th and 17th centuries and developed irrigation systems in the areas near Manila. This time also saw the development of the *zanjera* irrigation systems, built by landless farmers in exchange for farming rights.

When control of the islands was given to the Americans as consequence of the Spanish-American war in 1898, the American-directed government became involved in irrigation management. Act 1854 of the Philippine Congress established the Irrigation Division in the Bureau of Public Works in 1908.[48] This gave the government the responsibility for constructing irrigation systems in response to requests from villages and local authorities. The 1912 Irrigation Law followed, which gave the Irrigation Division complete authority to operate and maintain irrigation systems it constructed,

46 Lam 2001; 2006.
47 This history, unless otherwise noted, is drawn from NIA 1990, Bagadion 1989, and Araral 2006.
48 Interestingly, this legislation came only a short time after the United States government established its own irrigation agency, the Bureau of Reclamation, in 1902.

from the highest to the lowest level of the system. To pay for this, the Irrigation Division was allowed to collect irrigation fees from water users.

Perhaps more importantly, the law also established water rights. Farmers could register a claim for water rights, and a system of priority was to be established regarding these rights. This was also the first time that water user organizations could garner legal status and establish control over their own canal systems. An irrigation association could form, register itself with the Secretary of Public Works, elect its own officials, and collect its own fees for water management. These organizations would be exempt from paying the national water service fee, but responsibility for the system would be left entirely to the group. Bagadion estimated that the communal and private systems irrigated over 100,000 hectares (247,105 acres) by 1930, while the national systems covered about 86,000 (212,510 acres).[49]

The Japanese occupation came and went with the end of World War II, and in 1945 the Philippines became independent from the American government. The Philippine Congress soon began to engage in pork-barrel politics, which spilled into irrigation. The Irrigation Division was granted responsibility for the construction of all irrigation infrastructure in the country, including the communal systems. Politicians began using construction projects to "show appreciation for votes cast or to fulfill campaign promises."[50] Irrigation associations became less important, and some became mere paper organizations set up to fulfill requirements necessary for approval of construction projects.

---

49 Bagadion 1989.
50 Bagadion 1989, 4.

In the 1960s, the country faced self-sufficiency problems in rice production. The nation was producing 400,000 tons short of its needs and yields, at 1.7 tons per hectare, were among the lowest in the world. In contrast, population growth rates were among the highest in the world. The country faced an impending food production crisis. With rice production and price controls closely linked to the longevity of political leaders, Philippine politicians felt special pressure to increase production.[51]

In response, the government turned to irrigation. Through expanding the acreage under irrigation, rice production was to increase, and the government would be able to ensure food security for its population and, more importantly, stable prices. The Irrigation Division, though, was inadequate. Congress passed the Republic Act 3601 and President Macapagal signed it into law on June 22, 1963 creating the National Irrigation Administration (NIA), a semi-autonomous corporation owned by the government. The new institution was to expand the availability of water resources throughout the country and rely primarily on the collection of irrigation service fees for operations.

During its early existence, the NIA focused on infrastructure construction. Engineers dominated the ranks of the organization, with the greatest opportunities for advancement found in the construction division. Operations and maintenance were discounted. Even so, "it was in operation and maintenance where the NIA encountered its severest problems and its greatest strategic challenges."[52]

The organization also fell short in fee collection. Despite increasing the irrigation fees only a few years after they were implemented, the NIA was operating in the red. It

51 Philippine politicians used rice supplies and price controls to gain votes. Presidents Garcia and Macapagal both lost office in part due to rice price spikes prior to the elections. See Intal and Garcia 2005.

52 Bagadion 1989, 5.

could not cover the costs of operation and maintenance, much less the budget for infrastructure construction needed to expand the irrigated service area.

Farmer participation was also limited. Water users were primarily expected to provide funds for the irrigation systems, but not much else. Feedback on construction projects was only solicited after decisions had been made to build, and many of the new irrigation systems actually overlapped with communal systems that existed previously. The new systems often destroyed the preexisting farmer organizations. Farmers reacted negatively toward some of the new systems, destroying or adjusting NIA-built infrastructure that they found useless or contrary to their own requirements.

NIA officials who conducted study tours in Taiwan and the United States were impressed with farmer participation and management of systems under government supervision, but the emphasis on construction continued. Water user organizations that were established were primarily paper organizations. Farmer participation did not emerge, and with the expansion of NIA-managed irrigation systems, there were more and more canals for officials to monitor. Many of the systems quickly fell into disrepair.

Issues of food security continued to threaten despite the NIA's efforts over the decade. As the 1964 election drew near, Macapagal's administration increased rice imports, unsuccessfully trying to decrease prices and deter public displeasure. When President Ferdinand Marcos came to power at the end of 1965, he linked his political trajectory to promises of food security during his first term, and the government put a great deal of effort and resources into achieving this goal. In 1968 the Philippines was able to export a small amount of rice, and Marcos trumpeted the success as he sought re-

election in 1969. The achievements of his rice production programs contributed to Marcos becoming the first president to win re-election.[53] The future of self-sufficiency, though, was far from certain.

During the political crisis of 1972, brought on partially by profligate spending on his part, Marcos declared martial law in the Philippines. As part of his authoritarian regime, he declared the New Society Project, in which the state was to play a major role in promoting development. The project included massive reforms of the civil service, including doubling the number of civil servants and reshaping agencies to become development-oriented.[54]

One of the pillars of the New Society Project was the goal of returning to self-sufficiency in rice production and eventually to become a rice exporting country. Irrigation expansion and increased efficiency were seen as vital to this goal. To attain this goal, Marcos became a personal patron for the NIA.[55]

The president issued four decrees geared toward reforming and increasing the capacity of the NIA. Two, in particular, reshaped the incentive structures within the bureaucracy, PD 552 and PD 1702. PD 552 provided for the organization to become a semi-autonomous unit which could incur its own debt from international lending agencies. It also allowed for water user fees collected by the NIA to be kept within the organization.[56] This had the effect of creating a financial stake for the NIA in providing service to farmers which would result in fee payment. Essentially it introduced a market

53 Doronila 1985. At the same time, Marcos expended so many government funds on pork projects, including irrigation infrastructure, that he broke the country's bank. See Hutchcroft and Rocamora 2003.
54 Endriga 2001.
55 Araral 2006.
56 Bagadion 1989.

force into the relationship between farmers and the NIA.[57] PD 1702 allowed for the NIA to access foreign loans and keep a portion of the money for operating costs.

Following these decrees the NIA began to focus on fee collection. But fee collection would never be enough, as irrigation required a great deal of manpower, which the agency was unable to fund. No matter how efficient fee collection became, it would never pay all the bills that came from a state-run irrigation system. The NIA had to learn to rely on the participation of farmers.[58] Water rights were also granted to farmers through the irrigation associations, which created another tie between farmers and the agency.[59] Due to these organizational structures, the agency was forced to rely on its relationships with farmers. By 1975 a policy framework emerged that could encourage effective water user organizations and cooperation between NIA officers and farmers.[60]

To take advantage of working with farmer groups, though, the NIA was forced to make some major changes within its administrative structure and the way civil servants worked with irrigation associations. Officials found that involving the water user organization in the initial planning stages of an irrigation system and requiring a small monetary investment resulted in greater farmer participation. Farmer participation also resulted in decreased government expenditures on projects.

Within a few years, pilot projects in farmer-agency cooperation developed into nation-wide policies. Loans from the World Bank and USAID were used to expand the coverage of water user organizations beginning in 1981. In 1983 the NIA also changed its accounting system to reflect the greater reliance on irrigation associations and reward

57 See Gunasekara 1996.
58 Bagadion 1989.
59 Raby 1997.
60 Bagadion 1989.

officials who worked with farmer groups. This provided another step toward greater incorporation of farmer participation.[61] The implementation of participatory management was expanded from communal systems to the larger national systems in 1984. The NIA's Institutional Development Division was charged with establishing and developing irrigation associations.[62]

Reforms of the irrigation system in the Philippines did not stop, though. Throughout the 1980s, the NIA worked to establish and cooperate with farmer organizations which could operate and maintain their irrigation systems, and by 1986 PIM programs had reached 37 nationally-managed systems covering about 35,000 hectares (about 86,847 acres). The success of the program was widely recognized,[63] and in 1987 the program was expanded to all national irrigation systems in the Philippines. By the early 1990s, international loans from the World Bank and the Asia Development Bank were obtained to expand the coverage of irrigation associations; by 1994, 70 percent of the area of large-scale irrigation systems was contracted out to water user organizations. Full turnover of the systems was rare, though.[64] Joint management between the NIA and the irrigation associations was much more common. International visitors traveled to the Philippines to learn of the project and potentially learn how to implement PIM in their own developing countries.

The 1990s, though, were not always kind to the water user organizations. In 1986, the Marcos regime fell. As it did, a new constitution and democratic rule took hold. The 1987 constitution provided a number of changes to the civil service systems and the

61 Korten and Siy 1989.
62 Raby 2000.
63 De los Reyes and Jopillo 1986; 1989.
64 Araral 2005.

provision of rights to people's organizations, which included irrigation associations. Unfortunately, policy shifts in the Agriculture and Fisheries Modernization Act of 1997, despite recognizing irrigation associations, limited their control of secondary canals. The NIA, using this provision as well as a 1991 law on local government, has avoided turnover of irrigation systems to water user organizations. By the late 1990s, the NIA focus on water user organizations had diminished, evidenced by a decrease in NIA funds dedicated to implementing participatory policies. Instead funding was re-routed toward construction projects. In 1999-2000, the number of farmers in training for PIM dropped by 58% and the number of irrigation associations receiving NIA support dropped 49%. By the end of the 1990s, the NIA was no longer as concerned in promoting water user organizations. A 1998 report voice these changes:[65]

> The National Irrigation Administration is in many ways a model institution because it is partially autonomous and self-financing, has gone through a bureaucratic reorientation process over the past 15 years, and can claim considerable success in its participatory approaches to building farmer-based irrigation associations. Nevertheless, NIA in recent years has not exhibited the same level of dynamism as it had previously, and it was stated that some of its employees would prefer to be reabsorbed as part of a normal government bureau.

Philippines Evaluation

The policy framework for PIM in the Philippines has changed a great deal since the establishment of the NIA. In this section, I focus primarily on the period which ran from the mid-1970s through about 1990. This was the era in which the Philippines is

65 Asia Productivity Organization 1998, 3.

widely acknowledged to have been most focused on participation in irrigation. I then will briefly discuss the changes which happened after the 1990s.

First, the legal framework established during the 1970s and early 1980s in the Philippines was very favorable to PIM promotion. Presidential Decree 1067 in 1974 allowed water rights to be held by either individuals or irrigation associations, but individuals could only hold rights if no irrigation association existed. This provided the organizations with the resource that they could use as a club good to create some excludability. Legal rights were assigned to the Irrigation Associations to collect fees and manage their systems. Presidential Decree 552, with its requirements for farmer contributions, provided strong incentives for the NIA to focus on water user organization development. Such a legal framework strengthened WUO.

At the same time, the international community led by the World Bank heaped praise on the NIA's reforms.[66] The organization was widely recognized as an example to other countries, such as Thailand, which sent irrigation officials to study the NIA's reforms. The agency was also widely praised for its efforts to encourage farmer participation in the irrigation process.[67] It was one of the foremost irrigation reformers of the time, leading with the idea of irrigation management turnover in which irrigation systems would be operated and maintained by user groups rather than bureaucrats. Irrigation associations across the Philippines were established with the potential to become effective management organizations. A domestic evaluation of the participatory systems and the water user organizations involved in them demonstrated that

66 A World Bank official was reported to say, “NIA is the finest irrigation agency in the whole of Asia and in any developing country in the world.” Quoted in NIA 1990, 57.

67 See Korten and Siy 1989.

participatory systems were much more effective and efficient than those state-run systems which had not yet implemented a participatory approach. The report stated:[68]

> NIA's participatory approach achieved most of its intended results – larger irrigated areas, greater productivity, stronger associations, improved water distribution, better compliance with government policy, and improved relationship between farmers and the government.

The success was credited to a favorable policy framework, bureaucratic procedures, and the attitude of the street-level bureaucrats charged with implementation.[69] Due to the massive task of implementing a participatory approach across the country, it was not immediately enacted nation-wide, but the policy framework was established and initial results were very encouraging. The Philippines seemed to be well on its way to fully implementing a nation-wide PIM system.

The combination of a policy framework where irrigation associations were granted legal status, water rights, and negotiating authority with the irrigation agency combined with international praise leads me to give the Philippines a positive value on the dependent variable for the time period from the late 1970s through the 1980s.[70] If my theory is right, we should expect to see political vulnerability leading to this policy change with a lack of bureaucratic fusion.

Politically, Filipino politicians felt the pressure of food security and the need for increased irrigation coverage. As noted above, rice availability and prices determined the

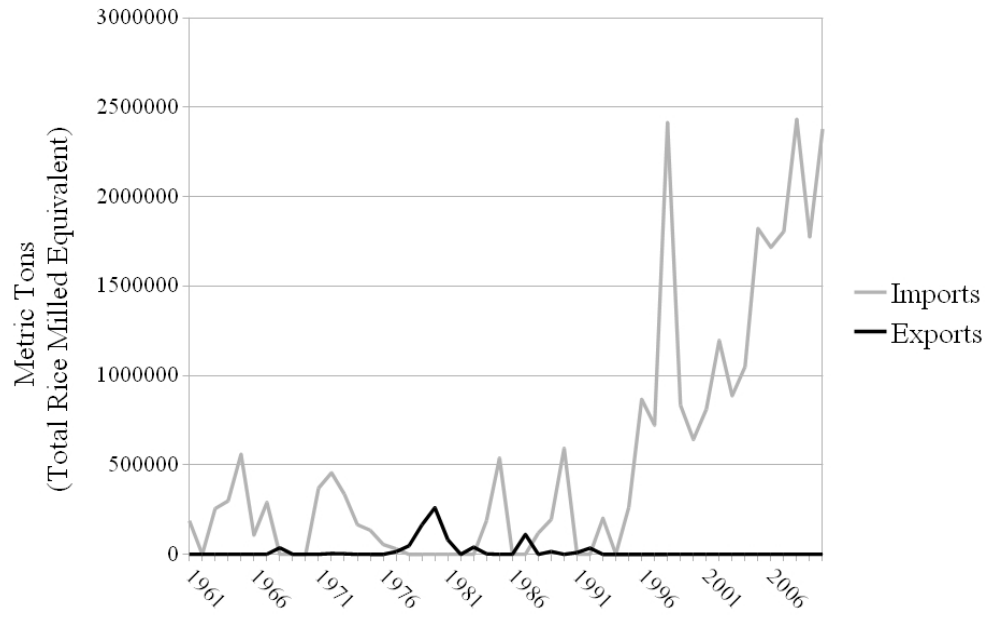
68 De los Reyes and Jopillo 1986.

69 For another domestic evaluation of irrigation associations with similar conclusions, see Lauraya and Sala 1995.

70 It is important to note here that I acknowledge the Philippines value on this variable does not mean that it experiences the same success as Taiwan, nor does it mean that the success experienced was permanent. This is discussed in further detail below.

political fortunes of presidents. As rice prices increased, the government would scramble to provide subsidized rice, but the stocks were rarely adequate. Such failures directly contributed to the electoral loss of both the Garcia (1961) and Macapagal (1965) presidencies.[71] Figure 3.7 shows the issue of rice self-sufficiency which faced these politicians.

Figure 3.7: Philippines Rice Imports and Exports



Source: UN Food and Agriculture Organization Statistics

Irrigation was seen as vital to rice production and to political survival. In his state of the nation address in 1954, then-President Magsaysay stated, "We shall hasten the construction of more irrigation systems and encourage increase in rice production."[72] President Macapagal later oversaw the creation of the National Irrigation Administration

71 Intal and Garcia 2005.
72 Quoted in NIA 1990, 29.

in 1964. The NIA, though, was not immediately able to expand the irrigation system, and Macapagal presided over a rice crisis, as the country had to import over 569,000 tons of rice in 1965. Recognizing this vulnerability, Macapagal's successor, Ferdinand Marcos, felt that it was vital to his success as a politician to diminish the perennial problem of rice self-sufficiency.[73] Prior to overturning democracy, President Marcos staked much of his electoral success on attaining self-sufficiency in rice production, and he quickly released funds for the NIA to engage in infrastructure expansion. In 1966 Marcos demonstrated his involvement in irrigation management by personally choosing the administrator of the NIA. When Alfredo L. Junio, a professor at the University of the Philippines, expressed reservations about taking the post, Marcos responded, "You do your job, I'll take care of the politics. Don't worry about funds, but make every centavo count."[74] Junio considered the President's request a command. The NIA embarked on a massive expansion, both in terms of staff and in terms of irrigated area.[75] By 1968 the country was even able to export a small amount of rice. This was a factor in Marcos' party's victory during the first by-election after he took office; it also helped him become the first president to achieve re-election in 1969.[76] Marcos even campaigned on the slogan, "Marcos means more rice."[77]

A financial crisis occurred during Marcos' second term as the peso lost 60 percent of its value and political forces, including the re-established Communist Party, opposed Marcos' rule, sometimes violently. At the same time, typhoons caused extensive damage

73 Dayrit 2001.
74 NIA 1990, 42.
75 In 1966 the NIA had 635 permanent and 2,101 temporary employees. By the same time in 1967 it had 1,632 permanent and 13,616 temporary employees. NIA 1990.
76 Doronila 1985.
77 Tadem 1986, 5.

to the new irrigation systems, and the country was forced to import over 300,000 tons of rice. The political situation became untenable, and Marco decided to enact military rule, partly blaming it on the rise of Communist pressures against the government.[78] As the country went through an authoritarian transition, Marcos argued that bread was of more value than freedom. Continuing emphasis on rice self-sufficiency prompted pressure on irrigation to become more productive and more responsive to farmer's needs.

The Marcos regime based its legitimacy on increasing agricultural production, which tied it to increasing irrigation coverage and efficiency. Marcos boasted of these increases in his state of the nation address in 1980, "We have converted a grain-deficit country to a rice-surplus-and-exporting country... Over the brief span of seven years we managed to build … irrigation systems that water as much an area as is equal or more than the beginning of the Spanish regime in 1521."[79] The reforms of the NIA were central to making such expansions possible. Thus Marcos' political vulnerability fed directly into the policy changes which reformed the irrigation bureaucracy. In fact, the state's inability to maintain rice self-sufficiency and manage rice prices contributed to Marcos' downfall. [80] In the 1986 snap elections he was unable to tout rice prices or exports as the Philippines had became a net importer in 1984 and rice prices had increased in 1985.

Recognizing the role of rice supply in presidential politics, I assign a high degree of political vulnerability in irrigation to the Philippines. Philippine presidents since the 1950s had all engaged in the effort to expand irrigation in order to achieve higher rice

78 Marcos 1974. The threat of Communist Party expansion in rural areas also contributed to the feeling of vulnerability in policy issues relevant to farmers, such as irrigation.

79 Marcos, Ferdinand. "Fifteenth State of the Nation Address," July 28, 1980. Accessed May 16, 2012 from http://www.gov.ph/1980/07/28/ferdinand-e-marcos-fifteenth-state-of-the-nation-address-july-28-1980/.

80 Tadem 1986.

production. Their inability to develop the institutional capacity for efficient water management and thus increase rice production contributed to their inability to achieve re-election. Marcos was able to build on the earlier institutions developed and expand irrigation management to include more participation. The question then becomes why it was Marcos who was able to do so when prior presidents had not.

I have two possible responses. The first has to do with regime type. The Marcos administration's efforts to expand into participatory management only occurred after he had declared martial law. The policy space and control he achieved during this time due to martial law may have been what was missing during the earlier administrations. He was able to bypass potential veto players in congress and the courts to accomplish his policy goals.[81] Arguably, his time horizon as a dictator may have also mattered.[82] Reforming an irrigation agency takes a great deal of time, and an administration would be unlikely to fully implement such reforms within a single four-year term. This argument may also find some support in the Taiwan case where the KMT was able to engage in institution-building as an authoritarian regime, but after democratization, the institutions have languished, in part due to pork-barrel politics.

A second explanation comes from the budgetary constraints contributing to the political vulnerability experienced by Marcos after his 1969 re-election. Prior presidential politicians had engaged in a great deal of corruption during elections, but they reigned in their spending during other times. Marcos did not. His government ran massive deficits to build infrastructure and parcel out pork to his supporters, leading his country into a

81 See Tsebelis 1995.
82 Olson 1993.

balance-of-payments crisis in 1970.[83] This financial crisis meant that access to unlimited funds for infrastructure projects had ended. The President could not spend himself into rice self-sufficiency. Instead he would have to force the NIA to become more efficient with less money. This meant a reliance on more farmer inputs, which required institutional capacity.

These explanations may provide some understanding as to why Marcos responded to high political vulnerability differently than his predecessors, but they do not change the value of the independent variable. Marcos felt extremely vulnerable on the policy issue of rice production, which necessitated policy reform in irrigation. I return to these issues in the concluding chapter.

The value of my second independent variable, bureaucratic fusion, was low. The Philippine bureaucracy experiences a fair amount of political oversight. This monitoring comes in the form of anti-corruption agencies[84] as well as legislative oversight.

Also, when established, the Philippine bureaucracy was based on the American system, including an emphasis on deferring to politicians. Its subservience only increased during the Marcos dictatorship.[85] During his tenure, the civil service doubled in numbers, but they were always firmly under his authority. Bureaucratic purges were also common, with civil servants from all ranks in danger of losing their positions if they did not please politicians. At one point in Marcos' administration more than 1,500 civil servants were dismissed simultaneously.[86]

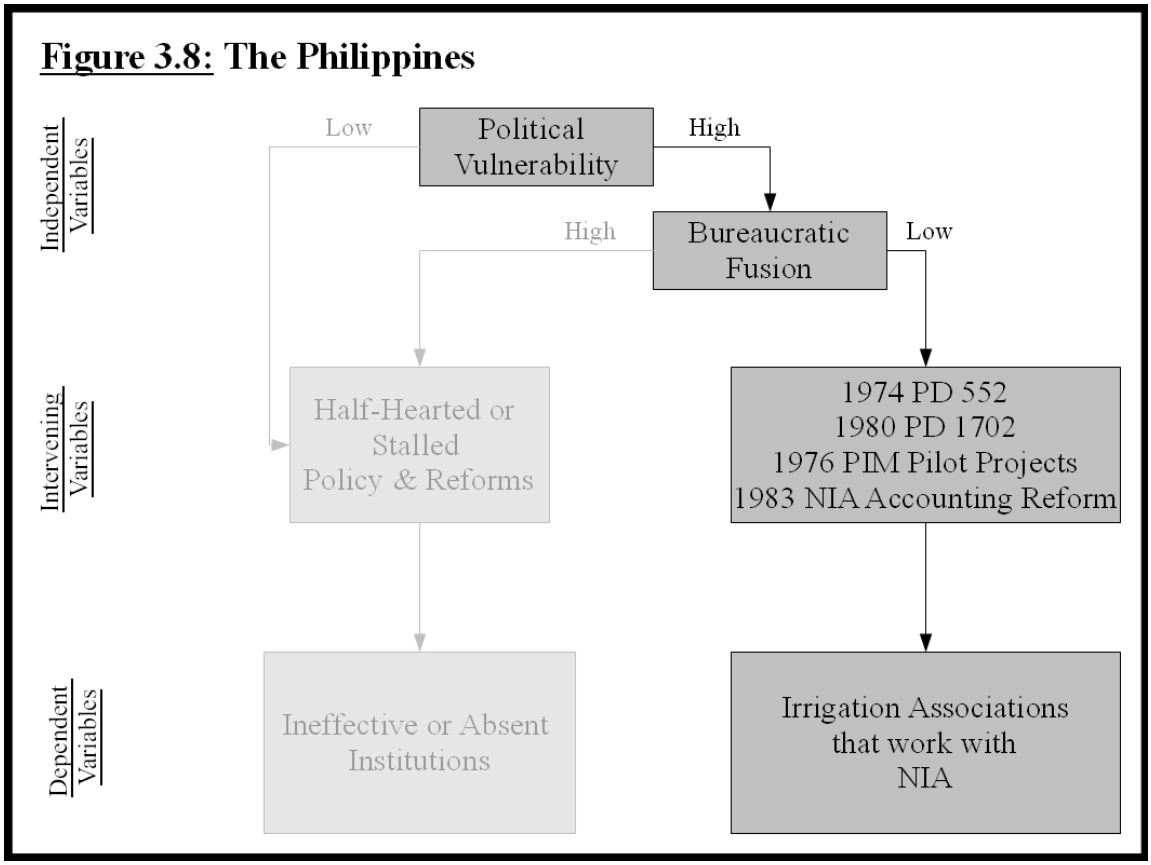
With such evaluations, the Philippines bureaucracy was far from fused with its

83 Doronila 1985; Hutchcroft and Rocamora 2003.
84 Fernandez 2004; Dayrit 2001.
85 Endriga 2001.
86 Carino 1992.

politicians. In further support of this evaluation, one scholar has referred to the bureaucracy in the Philippines as the "dominated bureaucracy" and "timid."[87]

I demonstrate these values placed my theoretical framework in Figure 3.8.

Figure 3.8: The Philippines



This, though, is not the final word on PIM in the Philippines. As noted above, the 1990s were not nearly as kind to water user participation in irrigation management.[88] The country's "venerable tradition" of irrigation reform turned into a static status quo wherein the NIA continues to focus on construction and rehabilitation and farmers have perverse incentives to allow systems to fall into disrepair so that the NIA will step in.[89] Why did

87 Carino 1989; 1992. Of course, a completely dominated bureaucracy does not always result in such positive outcomes, as evidenced by the Philippine Banking sector, Hutchcroft 1998.
88 Vermillion 2005.
89 Briscoe 2000.

the effective policy framework established during the 1970s and 1980s fail to materialize completely? Experts on PIM argued that it was due to a lack of political will.[90]

The source of political vulnerability for Marcos, food security pressures, have continued for the country, and they are expected to increase. By 2025, the demand for rice is expected to grow by over 60 percent from 2000 numbers.[91] As clear in Figure 3.7, the current agriculture conditions are inadequate to deal with the the growing demand. 1992 was the last year when the Philippines exported a small surplus of rice. Why, when facing food security pressures, did politicians not place greater emphasis on institutions which could increase irrigation efficiency?

After the government transitioned to democracy, Marcos' long time reliance on food production for legitimacy fell. Unlike Marcos, who frequently spoke of food security and trumpeted his advocacy for the issue, the governments which followed found other issues upon which to build their legitimacy. Politicians began to focus on pork-barrel projects, regional identities, as well as other issues in order to compete for office.[92] Political vulnerability was no longer based on food production and, thus, irrigation.[93] In essence, holding political office was no longer tied to monitoring the activities of the NIA as Marcos had.

This shift became evident early in the democratic transition. In 1986, the newly elected President Corazon Aquino accepted the resignations of the upper echelon of the NIA administration. In their place, she chose to appoint new top officials from the private

90 Asia Productivity Organization 1998.
91 Dayrit 2001.
92 Lande 1996. This was much like the period of time prior to Marcos' rule.
93 Water is relatively abundant in the Philippines except for a few locations, such as the area surrounding cities like Manila and Cebu.

sector, including a 39-year-old lawyer as head of the organization. All of those chosen to head the organization had little experience in irrigation and none with the NIA. In her choices, President Aquino showed little concern for ensuring the continued success of the NIA in increasing irrigation efficiency. By the end of 1986 employee grievances forced the replacement of all top officials with career NIA employees, except Alday, the 39-year old lawyer who remained head of the agency.

The momentum of the NIA's PIM programs evaporated in the late 1980s and early 1990s due to a number of shifts, including reduced transfer of responsibilities to irrigation associations.[94] By the late 1990s, the government had relaxed the pressure it placed on the NIA to collect fees and become financially autonomous.[95] Instead politicians began to focus on pork-based promises that would preclude some of the difficult tasks necessary for institution building such as monitoring the NIA.[96] By 1989, politicians had proposed House Bill No. 26572, which would abolish irrigation fees, the mechanism that had partially ensured the NIA's reliance on farmer participation. Instead of relying on fees, the NIA would rely on subsidies direct from the government.

While those initial bills were not successful, the idea of relieving farmers from the irrigation service fee continued to be popular among politicians. In fact, one presidential candidate, Joseph Estrada, promised to abolish irrigation fees as part of his pro-poor campaign. When he came to office in 1998, he did just that, although the implementation of his orders was not fully completed before his ouster from office in 2001. Nevertheless, payment of irrigation fees dropped significantly, and the NIA's revenues from water fees

94 Eleazar et al. 2005.
95 Vermillion 2005.
96 This shift bore eerie resemblance to the pork-barrel spending that characterized irrigation development in the 1930s prior to the Japanese invasion of the country. See NIA 1990.

dropped from 40% to 20% of total revenue.[97] The organization was even able to convince the government to subsidize the NIA at a level greater than the losses in irrigation fees. Thus it appears that the reduction in political vulnerability in irrigation led politicians to pay less and less attention to the institutional constraints which encouraged participatory irrigation management. This allowed the bureaucracy, with its set of negative incentives, to control irrigation policy and avoid the difficult task of promoting water user organizations.

At the same time, foreign pressure for irrigation reform has faltered. Foreign funds provided to the Philippines since 1990 have all focused on construction and rehabilitation rather than reform. They have also ignored alternative irrigation methods which might encourage greater participation.[98]

This reliance on foreign aid has created a system of perverse incentives within the NIA. About 40% of the NIA's budget relies on these loans. One World Bank memorandum states: “To a substantial degree Bank (and other donor) Funds have enabled the NIA to avoid facing the need for fundamental reform.”[99] Farmers, rather than invest in fixing the system, choose to watch their systems fall into disrepair. They can then call in the NIA to rehabilitate the system, relying on foreign donor funds.[100]

Thus, despite the progress made during the 1970s and 1980s, the reduction in political vulnerability has allowed the NIA to avoid completing the implementation of PIM policies begun in the 1980s. This environment of low political vulnerability, despite the continued low level of bureaucratic fusion, has created what Grindle and Thomas

97 Briscoe 2000.
98 Araral 2005.
99 Briscoe 2000, 2.
100Ibid. See also Araral 2005.

refer to as a "politics as usual" situation.[101] In such a state, without some sort of vulnerability, politicians fail to monitor the bureaucracy for policy implementation. In the Philippines case, they even facilitated dismantling the monitoring mechanisms, water user fees, which had been established previously. This allows perverse incentives in the interaction between the NIA and international funding agencies to determine policy implementation. Thus, ineffective institutions are able to emerge and persist, much like my theory would predict.[102]

Country Study – Indonesia

The people of the Indonesian archipelago have been engaged in irrigation for centuries. Prior to the arrival of European colonizers, local groups and villages organized and managed small-scale irrigation systems, primarily without support from the local lords. These systems often continued despite monarchic or dynastic changes.[103]

After the Dutch arrived, they built large-scale irrigation systems on Java designed to water massive sugar cane plantations. These efforts drew land, labor, and water resources away from food production, damaging or altering native organizations for water management in some areas. For the most part, though, small-scale irrigation for food crops continued generally unheeded by colonizers until famine struck central Java in 1854-1856. At that time the colonial government began developing irrigation for food crops, although under a lower level of intensity than the sugar projects. During the same era, the Colonial Department of Public Works was established to deal with irrigation

101Grindle and Thomas 1991.

102As has been noted above, the Philippines has a number of poorly performing sectors, with irrigation being only one of them. If we were to take my theory and apply it to other sectors, I suspect that we would find that a lack of political vulnerability contributes to the country's poor developmental outcomes. This, though, is a project for another time.

103FTP-UGM 2006.

issues.[104] Also at approximately the same time, the Delft Institute of Technology in the Netherlands opened a course of study into hydrological engineering dealing specifically with the topography of the Dutch East Indies. This marked the beginning of the technical turn in irrigation management in Indonesia. In 1921 a course of study in hydrological engineering for locals opened in the Bandung Polytechnic Institute.

The technical turn in irrigation began to eat away at the locally-established irrigation systems in Java. While the native system in Bali, called *subak*, was able to survive generally unhindered until the Green Revolution in the 1960s, its Javanese counterpart was replaced by the *ulu-ulu* groups that the Colonial Department of Public Works felt were more effective.[105] These organizations had to work with the colonial authority to manage water distribution between sugar cane and other crops. The main management technique was to provide water to the sugar cane during daylight hours. Only during the night were farmers allowed to water their paddy fields. This created a number of conflicts among farmers and between farmers and the Dutch authority. The shifts in cropping patterns also resulted in an increase in disease and pests that destroyed crops. Canal systems, at least those not directly related to sugar production, fell into disrepair. By 1870 the Dutch East Indies was forced to import rice to feed the native population.

In the years leading up to Indonesian independence, the Colonial Department of Public Works became more and more involved in managing water systems and building new infrastructure, but there was little transfer to local control or attention paid to local

104This history is drawn from Arif 2009.
105Lansing 2007.

needs. Thus operations and maintenance, the tasks most associated with water user organizations, were carried out primarily by the government.

After independence in 1945 until Suharto's New Order Government in 1966, the Indonesian government largely ignored irrigation development. During this time the state was generally weak and the government was more concerned about the threat of Indonesia's potential balkanization than with increasing water delivery. The country remained a major rice importer.

As Suharto came to power in 1966, one of his major concerns was food security. The issue became a point of both national pride and national security. The government saw updating and expanding irrigation as one of the keys to reaching self-sufficiency in rice production, but this concern was tied to his fear of community movements that might challenge his rule. In 1969, a presidential instruction was issued regarding *Perkumpulan Petani Pemakai Air* (literally 'groups of farmers using water' or local Water User Groups, referred to in Indonesia as P3A). The order mandated that these new organizations become responsible for tertiary canals, taking the place of the *ulu-ulu* groups that had operated previously. The *ulu-ulu* and any indigenous groups were to disband. New rules from the Ministry of the Interior were developed to govern the P3A. In essence, they further dismantled independent local organizations by introducing a heavy government hand.

The New Order bureaucratic machine expanded its tendrils into irrigation at all levels. World Bank estimates at the end of the New Order in 1999 put the size of the Indonesian civil service at 4 million, a vast difference from only 525,000 in 1970.[106] The

106World Bank. “Shape and Size of Public Employment: Administrative and Civil Service Reform in

increase translates to a number from about 4.4 civil servants per 1,000 inhabitants to 21.8 per 1,000 Indonesians in the 1990s.[107] This deployment of civil servants in all aspects of Indonesian life included the emergence of officials charged with handling water resources at every level.

The new irrigation officials promoted the expansion of technical irrigation systems often without regard to the capacity or interest of farmers. Permanent canals and water gates spread throughout Java and, to a far lesser extent, the other islands. From 1968 through 1993, approximately ten billion dollars were spent on irrigation infrastructure, with 70 percent of the funds coming from external donors.[108] By 1990 over four million hectares were irrigated.

The development of newly irrigated areas, along with greater availability of chemical fertilizers and pesticides, allowed Indonesia to take advantage of new rice varieties developed by the International Rice Research Institute in the Philippines. By 1984 the country reached self-sufficiency in rice production.

This massive expansion of technical irrigation infrastructure was under the management of the irrigation agency nestled within the Department of Public Works. Due to the growth in infrastructure, the irrigation agency was heavily dominated by engineers who were much happier developing new building projects or rehabilitating failing infrastructure than getting involved in the day-to-day issues of operations and maintenance (O&M). The budget of the agency also focused on building infrastructure

---

Indonesia." Website, Accessed on March 2, 2013. Permanent URL: http://go.worldbank.org/D1I2P870J0

107Rohdewold 1995.

108Bruns 2004.

rather than sustaining it.[109] Unfortunately, though, ignoring O&M did not make it any less necessary. Within only a few years of achieving self-sufficiency in rice, the government realized that action would be needed to care for the rapidly ailing infrastructure.

Also, despite the massive size of the bureaucracy, it was not large enough to manage the entire irrigation system. The strain combined with financial difficulties facing Indonesia during the 1980s which increased the leverage of the international donor community. At this time the World Bank and Asia Development Bank, the foremost donors in irrigation, had begun their push for participatory irrigation management reforms. Under manpower and financial shortages and policy pressure from international donors, the Indonesian government proposed the Irrigation Operation and Maintenance Policy in 1987. This act mandated that basic water user groups (P3A) be established to assist in the development and management of canal systems. It also directed that management of irrigation areas, at least on the local level, would be transferred to farmer control.

Despite the directives for irrigation management transfer (IMT), the Department of Public Works envisioned the role of farmers as limited. At that time water user groups were largely established by the irrigation agency to provide labor for projects, although there was regular assurance to the international aid community that these water user groups would be involved in operating and maintaining the system. Farmers were expected to gather for canal digging, cleaning, and construction. Water user fees operated basically as a tax paid directly to the irrigation agency, divorced from service provision,

109World Bank 1991. Construction contracts often went to companies with strong connections to Suharto and the military.

and enforcement was lax. Farmers were not expected to contribute much more than labor for the agency while it continued to focus on construction projects. Many of the groups were merely paper organizations which quickly fell into inactivity after formation.

This policy environment persisted throughout the final decade of the New Order. The irrigation agency managed water resources and continued to seek for ways to expand the irrigation network. Farmers continued in their role as consumers, although there was a fair degree of episodic mobilization for activities like cleaning canals.

Then the 1997 Asian Financial Crisis struck. As the value of the rupiah plummeted and thousands upon thousands of Indonesians fell into poverty, the political support behind the New Order disappeared. In 1998, Suharto stepped down and a transition to democratic rule began.[110] At the same time the government took part in a massive decentralization push. Political and administrative authority was reassigned to the provinces and districts, and millions of civil servants found that the local government became their new bosses.

During this period, World Bank officials and a few enterprising bureaucrats saw the opportunity to correct the inefficiencies in irrigation management. Since international donors had invested so much in irrigation in Indonesia with few of the promised results, they were anxious to see changes which would increase efficiency and promote water user organizations. The government was also aware that their treasured rice surplus had disappeared as demand grew with the population. Population growth also caused a great deal of productive land to transition from agricultural purposes. Rice importing had

110Many scholars debated the quality and stability of the democracy that emerged. Even so, with presidential elections looming in 2014, Indonesia has become the longest-running stable democratic regime currently in existence in Southeast Asia. See Siegel 1998; Hadiz 2003; Bresnan 2005.

begun again in 1996. A few officials also recognized and championed the importance of developing more efficient and less costly management of water resources through greater farmer participation. Beyond these pressures, Indonesian government ministries were struggling to pay their employees. With the fiscal failure looming, the government needed international donors' money more than ever. That money was conditional on reforms.[111]

Thus Indonesia embarked on a new series of policy changes which assigned more responsibility to farmer groups and reduced the influence of the central bureaucracies as part of the Water Sector Adjustment Loan (WATSAL) program from the World Bank. Other international donors also joined hands to support the WATSAL program, including the UN's Food and Agriculture Organization (FAO), the Japanese International Cooperation Agency (JICA), the European Union (EU), and the Asia Development Bank (ADB). In 1999 the government adopted the Irrigation Management Reform Program through a Presidential Decree[112] on Irrigation Management Transfer that was followed by Government Regulation Number 77 on Irrigation that took effect in December 2001. Officials also began the drafting process for a new water law which would replace the 1974 Water Law that placed control of irrigation management in the hands of central government ministries.

These legal changes granted legal status and authority to water user organizations to become involved in water management at the tertiary, secondary, and primary canal levels. The water user organizations were to take primary responsibility for operations and maintenance of irrigation systems. They were also granted authority to raise their

111 World Bank 2005.

112 Presidential Instruction Number 3, 1999. Reflecting external donor pressure for these reforms, within only two weeks of the presidential instruction, the loan agreement between Indonesia and the World Bank was formulated.

own funds.[113] Rather than pay irrigation fees directly to the irrigation agency as before, group leadership was allowed to collect fees and devote them to local needs.

The reforms also decentralized irrigation management by placing authority over irrigation in the hands of provincial and district governments. Fiscally, the responsibility for irrigation was also linked to WUO empowerment by providing local WUO joint authority over the *Kabupaten* (District) Irrigation Improvement Fund. The central government bureaucracy was essentially cut out of the funding chain. According to Suhardiman, these reforms were only successful due to the irrigation agency's initial ignorance of what was included in them.[114] This process was wrapped into the decentralization policies affecting almost all aspects of Indonesia's government.

These reforms, though, were bogged down in the implementation phase from 2001 through 2006. As seen in the Philippines experience, policy reform and implementation in irrigation management requires a huge number of individuals as well as intensive monitoring and enforcement.[115] Thus the process was slow.

As the process plodded forward through the early years of the twenty-first century, external circumstances were changing which diminished the pressure for reform. Indonesia's economic growth had returned to a respectable four percent by 2002, although still below numbers experienced in the 1990s.[116] This reduced the government's reliance on foreign aid, which in turn reduced the pressure for irrigation reforms.

113Asia Development Bank 2003a.

114Suhardiman 2008.

115One province-level official in the Department of Public Works complained, “We have a new law, and before we can even implement the new law, we have another new law. I am not ashamed to admit this. It is a big problem. No good at all. The rules are always changing; we can't keep up.” Interview, Department of Public Works Official, Yogyakarta, June 13, 2011.

116Numbers from World Bank World Development Indicators.

At the same time, the legislative process over a new water law became embroiled in politics as government ministries facing major reforms refused to support the legislation and came out in active opposition to the draft containing reform. The original draft legislation included numerous components empowering WUO. These components were in direct opposition to the interests of the Indonesian Irrigation Agency, which sits within the Ministry of Public Works.[117] The Ministry of Public Works[118] early in 2002 became active in the efforts to revise the draft legislation to protect its interests. It declared a moratorium on implementation of the WATSAL reforms and the ministry refused to take part in furthering the legislation for the new water law until its demands that changes in the legislation be made. It also allied with the largest political party in the legislature, the PDI-P, to guarantee its interests were protected.

Eventually the legislation was crafted to protect the irrigation agency's interests, including the removal of most policy components which would help empower WUO to operate and maintain their irrigation systems. When the 2004 Water Law was passed the World Bank and other international donors issued statements of disappointment, but their bargaining strength had waned.[119] In the end, control over canal operation returned to the irrigation agency, and foreign money was redirected to flow through the central ministries again. A 2006 Presidential Instruction followed the Water Law, elaborating rules

117This is treated in greater detail in the analysis section. For an exhaustive discussion see chapter 6 of Suhardiman 2008.

118At this time it was referred to as Ministry of Settlement and Regional Infrastructure (Kimpraswil) due to the merger between the Ministry of Public Works (PU) and the Ministry of Housing and Regional Development (Kimbangwil). I continue to use the term Ministry of Public Works to maintain consistency and reduce confusion.

119The World Bank even canceled distribution of the third trench of the WATSAL loan due to the Water Law. By 2005, though, the government of Indonesia had received a new loan program that replaced the money lost, the Water and Irrigation Sector Management Program (WISM). More details are in the analysis section.

regarding the WUO responsibilities, further eviscerating the organizations.

This was not the final blow to WUO during the decade. In 2008 top officials in the Ministry of Public Works and the Ministry of Agriculture worked together to remove authority over basic water user groups (P3A) from the irrigation agency and place it with the local agriculture agencies. Water user organizations for secondary and primary canals (GP3A and IP3A) remain under the irrigation agency's control, divorcing their activities from those of the basic groups. Central officials argued that this move was in response to the lack of manpower facing the irrigation agency and meant to encourage greater cooperation between farmer's groups and water user groups.[120] No matter the reason, the result has been that WUO have been further weakened due to the lack of interest and capacity of local agriculture officials in dealing with water user groups.[121]

Indonesia Evaluation

Historically there have been two periods wherein participatory irrigation management was considered in Indonesia. The first period occurred during the years of Suharto's New Order government shortly after the country attained self-sufficiency in rice production. Prior to that, farmer participation in irrigation management was never under serious consideration due to heavy push for infrastructure development and the lack of a participatory dialogue in both domestic and international circles. It was only in the late 1980s that the concept of PIM and irrigation management transfer found its way to Indonesia. Thus, in the analysis, I consider the years 1984 through 1998 as the first period.

120Interviews with Ministry of Public Works Officials and Ministry of Agriculture Officials, April-June, 2011.

121 Ricks and Arif 2012.

The second period came after Asia Financial Crisis in 1997 and the fall of Suharto. Due to the political upheaval and financial strains, new channels of political pressure opened up for both external funding agencies and domestic actors. This provided a new opportunity for institutional reform to take hold.

In this section I consider both of these periods. I apply my theoretical framework and identify values on both the independent and dependent variables according to the indicators presented in the previous chapter. Afterward I provide a brief summary table before moving onto my final case.

The first major policy shift toward participatory irrigation management came in the form of the 1987 Irrigation Operation and Maintenance Policy, which indicated a shift from complete government control over irrigation management to a half-hearted effort to include farmer participation. The policy, as indicated above, included transfer of local irrigation operations and maintenance to local water user associations, at least on paper. The actual responsibilities transferred were few, and actual activities of the officials tended to remain focused on construction rather than operations and maintenance.[122] Incentives within the bureaucracy did not change to encourage working with farmers, and generally only employees, not officials, were tasked with farmer interaction.[123]

An evaluation conducted by irrigation specialists stated that the process of implementing the 1987 policy may even have made the farmers more dependent on the irrigation agency rather than empower the water user associations.[124] The WUO received

122Bruns 2004.

123 The Indonesian irrigation agency is divided between civil servants and employees. Officials have decision-making authority, better salaries, pensions, and rank in the civil service. Employees come in a variety of titles, but they are not considered part of the civil service. Many work through temporary contracts.

124Vermillion et al. 2000.

legal status, but this did not come with authority to monitor and enforce organizational rules. Nor were the groups provided the formal capacity to bargain with government officials over infrastructure construction or management. In terms of a dependent variable, these policy changes resulted in a continuation of status quo institutions for participatory management. Thus, despite shifts on paper and compliance to international donor demands, there was no real policy shift.

At that time the major policy actors involved were limited. The parliament during the Suharto era did not engage in policy creation. It generally served as a rubber stamp for presidential decrees. Thus policy came from either the president through a presidential decree or through bureaucratic rules developed by the central bureaucracies. The main bureaucracies involved in irrigation policy were the Ministry of Public Works and the National Planning Board (BAPPENAS), with some oversight provided by the Ministry of Finance and the Ministry of Home Affairs. The Ministry of Agriculture was not significantly involved in irrigation policy.

At the local level governors and district officials were appointed by the central government under what was referred to as *dwifungsi*, or dual-function. This meant they were both political or bureaucratic figures as well as military officers. Thus there was little impetus and little room for departure from central government policy. The ultimate policy actor during this period was the president himself, Suharto. He, and his close supporters, were generally responsible for policy shifts. Even so, he left much of the responsibility for irrigation policy to the Ministry of Public Works and BAPPENAS.

Central ministries had strong vested interests in maintaining the status quo

regarding irrigation policy. Money from international sources, such as the World Bank and Asia Development Bank, flowed through the ministries before being distributed for projects. Suharto's New Order government was rife with graft, and central government offices were able to skim dollars off loans. They were also able to direct construction contracts to friends or relatives. Beyond graft, the ministries were also able to expand their influence through either maintaining or expanding their staffing levels. Making sure that money flowed through the central offices was key to perpetuating this influence.

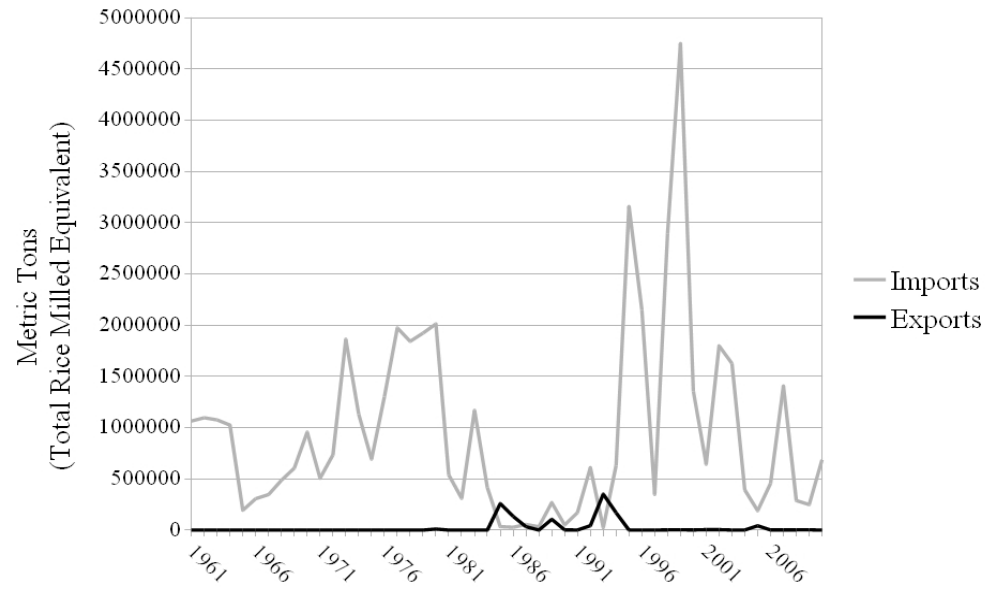
This climate fits the description of bureaucratic fusion. Major policy actors involved in irrigation were also bureaucrats who had strong self-interests in sustaining the status quo. Thus, my theory would predict maintenance of the status quo, just as we observed.

What of political vulnerability? During the 1980s, Indonesia faced a fiscal crisis due to fluctuations in oil prices. The government depended on natural resource extraction and sales to continue funding itself, but as those revenues fell, it had to rely more on loans from international sources, at least in irrigation. Soenarno, the director of the irrigation agency in the late 1980s, later argued that these fiscal pressures and the requirements of foreign loans were one of the main drivers behind the policy shift in 1987.[125] Not only did the agency need access to foreign loans, it needed a long term solution to the high cost of operations and maintenance. Local farmer participation in paying water user fees and providing labor was seen as one way to resolve the problem of dwindling agency resources. Importantly, participation was construed as a source of money and free labor, not as a source of information or input for project management. At

125Soenarno 1995.

the same time, the government had just recently achieved Suharto's stated goal of self-sufficiency in rice. Maintaining that self-sufficiency became a major policy concern. Figure 3.9 shows the rice imports and exports in Indonesia.

Figure 3.9: Indonesian Rice Imports and Exports



Source: UN Food and Agriculture Organization Statistics

With revenue falling, population expanding, and irrigation infrastructure needing more maintenance or rehabilitation, irrigation policy actors did face some vulnerability. They sought for resources which would allow them to get out from under the vulnerability while experiencing the lowest possible cost to themselves. Thus they turned to a ready source of funds, international loan agencies. The policy actors bent to the will of the World Bank and Asia Development Bank to develop a participatory irrigation management policy. Once the loans came through, and the government complied to the international agency demands, at least on paper, the political pressure lessened. Irrigation

management could move forward much as it had for the past decade, focusing on construction. O&M and participatory management became something talked about but rarely done. No incentive structures were developed for street-level bureaucrats to engage in participatory work, and the majority of the contact between the irrigation agency and farmers was conducted through employees rather than civil servants.

Thus political vulnerability prior to the 1987 policy changes was moderate, but in the presence of bureaucratic fusion and a relatively costless source of funds, the vulnerability resulted in a maintenance of the status quo.

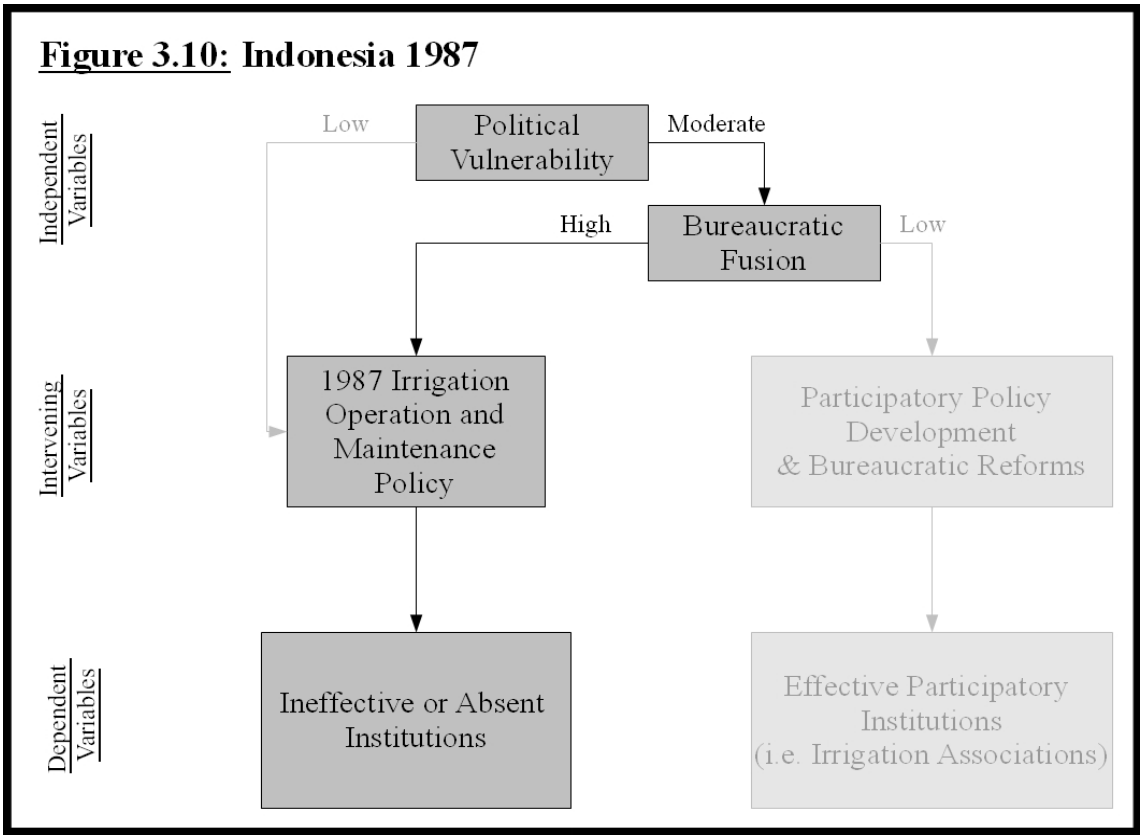


Figure 3.10 places these findings in my theoretical framework. Initial moderate political vulnerability met with bureaucratic fusion. This led policy actors to appease the international donor community with commitments to participatory irrigation reforms. As

the World Bank and Asia Development Bank requirements were met on paper, the Indonesian government was able to move forward without truly enacting reforms. Thus the institutional environment remained the same.

The second period under consideration, 1998 through 2010, began when Suharto fell and the country embarked on its transition to democracy. As mentioned above this resulted in massive reforms to the entire government, including the irrigation sector. But to what degree did these reforms reflect actual changes to the rules governing water user groups and their institutional form?

Evaluations of the water user organizations in Indonesia from 2000 through 2010 are spotty, and the introduction of the 2004 Water Law changed the direction of reforms during the implementation process. Nevertheless, I was able to identify a number of data sources which provide evaluations of the state of WUO in Indonesia during those years.

First, according to the Indonesia's Department of Public Works own evaluations, water user organizations are not generally well-developed. 2004 was the most recent year that the ministry conducted a full-scale survey of water user groups in the country. Of those reported, only 7,131 of the 47,647 water user organizations on the record books were considered to be developed. In area terms this accounted for only 320,690 hectares of the approximately four million reported.[126] In other words, only about fifteen percent of water user organizations covering only about eight percent of irrigated land met the department's criteria for functioning. Unfortunately the data collected was of poor quality with numerous provinces failing to report their numbers. The final evaluation of "developed" was also questionable, as local officials used different criteria in different

126These are the water user groups at the tertiary level (referred to as P3A in Indonesia). PU 2004.

areas to define what a developed WUO was.[127] After the data was collected, there was no real push to enhance it or obtain more accurate reports. Since 2004 there has been no further national effort to collect information on water user organizations. The lack of data serves as one indicator of the low level of commitment to the issue in the irrigation agency.

External groups and researchers have also made statements regarding the status of water user organizations throughout Indonesia. Regarding the period from 1999-2003, Suhardiman's investigation of local water user associations found that the WATSAL program's effects put more authority in the hands of farmers but, thanks to local politicking, "failed to revitalize farmers' role in system water distribution."[128] An Asia Development Bank report investigating the implementation of the 1999 reforms also found that water user group empowerment was limited, although in areas where irrigation management transfer had been implemented, the WUO and farmers were much more active in system management. Thus there was some preliminary evidence that Indonesia was on the path toward developing more effective institutions. Unfortunately IMT at that time was extremely limited and subject to government influence: "The smooth running and turnover of the [irrigation] systems is … limited by clashes of interest among the various government departments involved."[129] This evaluation was also made prior to the implementation of the 2004 Water Law.

Also, the 1999 reforms granted greater legal status to WUO. They were given the legal authority to monitor and enforce their organizational rules as well as collect and use

127Personal communication with Department of Public Works Official, September 2011. He stated that many provinces failed to fully report their data and some of the data was likely falsified.
128Suhardiman 2008, 199.
129Williams and Weale, N.D., 5.

fees from members for the repair and construction of canals. This new legal framework provided the tools necessary for effective WUO operation and maintenance of irrigation systems, and there were early signs of success in some pilot areas.[130]

The reforms in 1999 and 2001 also made minor changes to the incentives within the bureaucracy for working with farmer groups. Where previously the majority of funds had been handled by the central agency, now these funds were decentralized and often assigned directly to water user organizations. This was an attempt to direct the focus of irrigation officials toward water user groups. Unfortunately, the implementation phase was long and the policy's life was short, so few actual changes took place in the incentive structure of irrigation officials. After the 2004 Water Law, incentives for participatory work were geared toward easily-monitored activities. Both local and national offices were evaluated on their performance in establishing water user organizations, but little effort was made to establish the effectiveness of these groups. Evaluations were based on quantity rather than quality. If numerical goals were achieved, then the officials were considered successful.[131] For example, BAPPENAS, the National Body for Planning and Development, working together with the Department of Public Works and the Ministry of Agriculture set yearly goals to establish water user organizations, which they distribute in manuals to local offices. During the first installment of the World Bank-funded WISM project (from 2006-2010), the three agencies agreed on a target of 1,150 GP3A organizations in 99 districts spread through 14 provinces. BAPPENAS reported that 1,395 had been established by 2010, showing that they had achieved their goal.[132]

130Multiple interviews, District and Provincial Officials, Yogyakarta, 2011.

131Interview, former BAPPENAS official, Yogyakarta, February 22, 2011.

132The World Bank was not as impressed with these numbers. Only two of the provinces in the project were allowed to move onto the second phase of the WISM project. Interview, Provincial Irrigation

The 2004 Water Law reversed most of the gains made due to the 1999 and 2001 legal reforms. The new law and the following Presidential Instruction in 2006 basically reestablished same policy framework that existed from 1987-1998.[133] Authority over water distribution at the secondary and primary levels was returned to government hands, and those WUO which had experienced irrigation management transfer found themselves bereft of the legal authority and tools they had used to organize farmer participation.[134]

Drawing on this data, I categorize the value of my dependent variable for Indonesia from 1999-2011 as negative. The development of WUO institutions nation-wide was begun under the early reforms in 1999 and 2001, but thanks to the reversal experienced in 2004, they never materialized as promised. This same pattern of initial reform with a quick reversal also occurred in my intervening variable, policy reform. Thus we see two values on the dependent variable in Indonesia from 1999 to 2011. From 1999 through 2003, we see initial moves toward a positive outcome, but after the 2004 Water Law we see a negative value.

Moving on to the independent variables we also see a somewhat bifurcated analysis. Prior to the fall of Suharto, the bureaucracy was intricately tied to politics. Portions of the 1998 reforms were meant to diminish the influence of the bureaucracy. This included a massive shake up of the Ministry of Public Works.

In 1999, Abdurrachman Wahid's presidency made a number of moves to reduce corruption. These included wiping the bureaucratic slate. The Ministry of Public Works that housed the irrigation agency, notorious for corruption, fell on the chopping block. It

---

Official, Yogyakarta, June 13, 2011.

133Suhardiman 2008.

134Interview, Farmer Leader, Kulon Progo District, Yogyakarta, August 12, 2011.

was abolished, and the new Ministry of Settlement and Regional Development was established with Erna Witoelar at its head. She came from an NGO background rather than rising through the ranks of the bureaucracy. At the same time Directorate General of Irrigation was abolished and authority over irrigation projects was placed under the Directorate General of Rural Development. These changes allowed more NGO and international donor influence to be felt; they also guaranteed top-level bureaucratic support for the irrigation reforms which were on the table.

Former top officials in the Ministry of Public Works, although powerless to stop the formation of the new ministry, were still able to protect themselves from completely losing their positions. They were instead relegated to the new State Ministry of Public Works, a ministry with some policy influence, but no access to development funds or the irrigation sector. This promotion to oblivion was short lived.

Despite the fact that the Ministry of Public Works was no more, the Ministry of Settlement and Regional Development bore it a canny resemblance. Corruption continued to be rampant in the ministry and performance was not markedly improved over the prior era. As mentioned above, the incentive structure for street-level bureaucrats did not change a great deal. Irrigation officials were still evaluated primarily on their work in infrastructure construction and maintenance. No real monitoring mechanisms were established within the agency to encourage more collaboration with farmers.

In 2001, the presidency changed hands when the legislative coalition supporting Wahid fell apart. As Wahid left government, so did his anti-corruption campaign and his government ministers. Megawati Soekarnoputri rose to the office of the presidency and

brought in a new Minister of Settlement and Regional Development who spearheaded the reunification of the State Ministry of Public Works and the Ministry of Settlement and Regional Development. He was a former top official in the irrigation agency, and he held strong ties with the officials who had been removed from authority and put in the State Ministry of Public Works.

These top officials quickly returned to their old posts in control of irrigation. The Directorate General of Irrigation was reestablished as the Directorate General of Water Resources. The former Ministry of Public Works' official logo was also reintroduced as the logo of the new Ministry of Settlement and Regional Infrastructure, thus removing all doubt that the Ministry of Public Works was back in business in fact, if not yet in name.[135] By 2004 the name had returned as well.

With the return of the Ministry of Public Works, there came a renewal of ties with politicians. While officials in the legislature were no longer a rubber stamp for presidential orders, they still were subject to bureaucratic capture. Many were former officials who still benefited from close ties with their bureaucratic offices. Others were happy to delegate policy-making authority to those they considered specialists. In the end, the bureaucracy became a major policy actor again.

For instance, during the policy-writing process which led to the 2004 Water Law, ministry officials from the newly-reformulated Ministry of Public Works became intimately involved in the legislation process. They lobbied politicians, established alliances with political parties, and were able to ensure that the legislation that emerged

135Local officials never actually turned away from using the nickname of the agency, “PU,” which stood for *pekerjaan umum*, or Public Works.

reflected the interests of the bureaucracy.[136] The Ministry even transferred officials who had promoted participatory policies out of the agency in order to facilitate the return to the old status quo.[137]

Thus the value of bureaucratic fusion regarding the Ministry of Public Works in Indonesia shifts over this period. In the years 1999 through 2001, the efforts of Abdurrachman Wahid's presidency removed the bureaucracy's control of the policy process. The bureaucratic purge of the Ministry of Public Works indicates a low level of fusion in the immediate aftermath of the Asian Financial Crisis and the fall of Suharto. Yet the old officials were able to re-establish political alliances and return to their old posts in 2001. They were then able to develop alliances with politicians and re-establish bureaucratic dominance in the policy-making process. Thus I categorize bureaucratic fusion as briefly low from 1998-2001 and high after 2001.

This leaves the final independent variable of interest, political vulnerability. Beginning with the devaluation of the rupiah in 1997, politicians in Indonesia faced a great deal of vulnerability. Suharto stepped down and politicians entered an era of uncertainty. The transition was not immediate, and it took a few years for the dust to settle.

After the first election held on June 7, 1999, a parliament coalition chose Abdurrachman Wahid as president. The government was tenuous, though, as the president's power rested on a coalition of parliamentary voters from smaller parties. 48 parties had contested the election, with six major parties passing the electoral threshold.

136For an exhaustive treatment of this process, see Suhardiman 2008, chapter 6.
137Interview, Irrigation Researcher, Yogyakarta, March 2, 2011.

The largest of these was the PDI-P with about 33 percent of the seats. The vice-president Megawati Soekarnoputri, also elected by the parliament, represented the PDI-P in the legislature.

The government and experts expressed concerns that during this time Indonesia would experience a process of balkanization, or disintegration into a number of smaller countries based on ethnic rivalries.[138] These concerns seemed well-founded as Timor Leste held a referendum in 1999 and attained formal independence in 2002. Also the Gerekan Aceh Merdeka (GAM) movement struggled for an Acehnese state; calls were also made for Papua to establish itself independent of Indonesia. These concerns spread throughout the government.[139] Wahid's government knew it needed to reduce the rampant corruption in the government and improve service provision throughout the archipelago in order to prevent, or at least diminish, calls for independence.

Added to these strains was the continued problem of fiscal difficulties. Indonesia needed foreign money quickly, but money from international and foreign donors came with strings attached.[140] Without making even further reforms, the government couldn't access the loans it needed to continue functioning and pay its employees.[141] The World Bank and the Asia Development Bank, who were the main sources of funding for irrigation, saw this as an opportunity to press for greater reform of the irrigation sector. Thus they tied the release of funding for irrigation infrastructure to reforms, including

---

138Kingsbury and Aveling 2002.

139Indonesian leaders feared the chance that portions of Indonesia might rally for independence throughout the early 2000s. Personal communication with Indonesian Diplomat, June 2010.

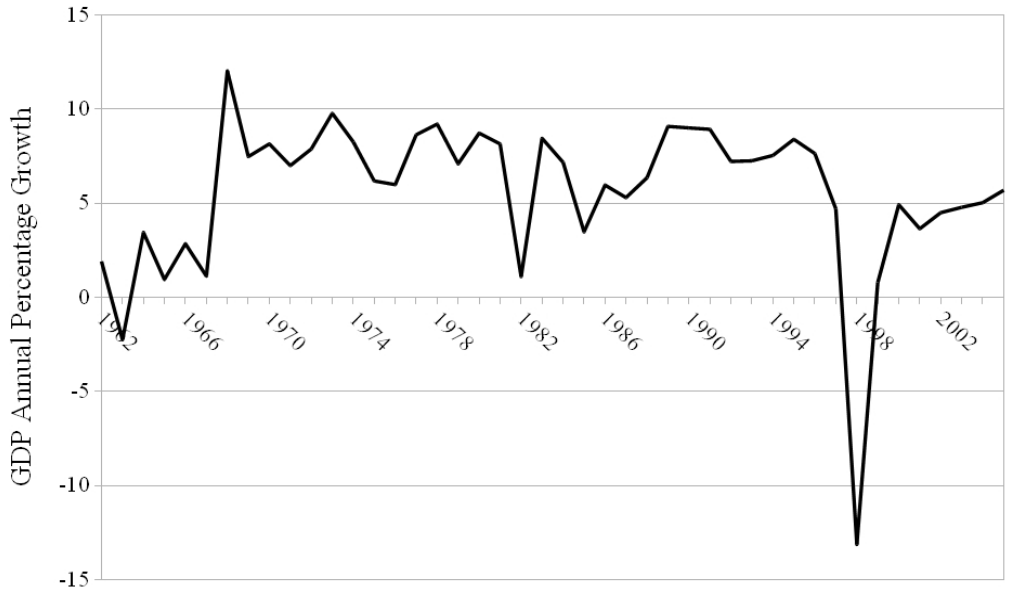
140The Jakarta Post. "Government to Rely on WB, ADB to Cover Budget Deficit." *The Jakarta Post.* January 9, 1999.

141Moestafa, Berni K. "World Bank Criteria for More Loans Tough: Economists." *The Jakarta Post.* October 7, 2002.

reforms for a greater degree of irrigation management transfer.

These pressures translated into a high degree of political vulnerability in irrigation felt by policy makers during the early years of the transition from authoritarian rule. Unfortunately for the irrigation reforms, the vulnerability was short-lived.

Figure 3.11: Indonesian Economic Growth



Source: World Bank World Development Indicators

By 2002, the Indonesian economy, although not at pre-1998 growth levels, had experienced a recovery, as demonstrated in Figure 3.11. This reduced the influence of the World Bank and Asia Development Bank in promoting reforms in irrigation management, especially reforms that would place management in the hands of farmers. In 2003, with only half of the $300 million WATSAL loan dispersed, Indonesian ministers and

politicians publicly declared that the remaining funds were not necessary.[142] By mid-2004, Ministry of Agriculture officials claimed that the agriculture sector had completely recovered from the financial crisis.[143] Politicians in the legislature paid less and less attention to the legal conditions necessary for water user groups to be involved in water management and more attention to what the Ministry of Public Works wanted in the legislation.

Two factions within the legislature competed over draft legislation for a new water law. The largest faction, headed by now-President Megawati Sukarnoputri's PDI-P party, argued that farmers were incapable of managing irrigation. Thus they, allied with the Ministry of Public Works, fought to re-establish central government control over irrigation resources. Smaller parties, spearheaded by GOLKAR and supported by the Ministry of National Development Planning (BAPPENAS), argued that the reforms were necessary.[144] In the end, the government largely ignored input from farmers, protesters, and the World Bank in crafting the legislation. Ministry officials reported that public input was minimal, with only three solicited comments from the public being registered after the bill was published for public review in *Kompas,* the most widely-read newspaper in Indonesia. Instead priority was given to suggestions from the Ministry of Public Works, especially in reference to government control over irrigation management.[145]

---

142 Kurniawan, Moch. "Official Plays Down World Bank Threat to Stop Water Aid." *The Jakarta Post.* October 20, 2003.

143 This was disputed by agriculture experts outside the government. Hakim, Zakki P. and Johannes Simbolon. "Government Claims Farming Sector Fully Recovered." *The Jakarta Post.* August 16, 2004.

144 Sri Saraswati, Muninggar. "Govt, House Told to Unite over Water Bill." *The Jakarta Post.* October 16, 2003.

145 Sri Saraswati, Muninggar. "House Completes Water Bill Deliberation in Days." *The Jakarta Post.* December 8, 2003. Suherdjoko and Sri Saraswati, Muninggar. "House to Stop Approval of Water Bill." *The Jakarta Post.* February 19, 2004. See also Suhardiman 2008, chapter 6.

The World Bank, true to its threats, canceled the final payment of $150 million for the WATSAL program loan. The government was easily able to ignore this. Within only a few months they had re-established communication with the World Bank to develop a new loan program, the Water and Irrigation Sector Management Program (WISM). The WISM loan program was originally designed as a three-phase adjustable loan spanning from 2004 through 2014.[146] Negotiations with the newly-elected Susilo Bambang Yudhoyono administration delayed the loan and changed it to a two-phase adjustable loan scheduled from 2006 through 2016.[147]

By the time that the WISM program began to spread throughout the archipelago, any political vulnerability in irrigation had disappeared. Despite the continued concern over regaining self-sufficiency in rice,[148] officials and politicians in the central government were safely insulated from both farmer input[149] and from pressures exerted by international donors[150] to provide greater opportunities for water user groups to become involved. Instead the Ministry of Public Works continued to focus on the construction and rehabilitation of irrigation infrastructure rather than operations and maintenance, generally the responsibility of water user groups.[151] What provisions of the

146World Bank. 2005.

147At the end of the first phase of the program in 2011, only two of the 33 Indonesian provinces, Yogyakarta Special Administrative Region and Nusa Tenggara Barat, met the necessary conditions to receive the second phase of the loan. Interview, Ministry of Public Works Official, Yogyakarta, June 13, 2011.

148Abdullah, Rizka. "Long Way to Achieve Self-Sufficiency in Rice Production." *The Jakarta Post.* October 16, 2002.

149Despite holding public hearings, the Ministry of Public Works and the legislature had basically ignored farmer input during the drafting of the 2004 Water Law (Suhardiman 2008, chapter 6). This pattern continued in the following years.

150Another piece of evidence comes from the failure of the majority of Indonesia to abide by the requirements of the WISM program loan. Only two provinces attained the threshold necessary to receive the second installment of the loan. Interview, Ministry of Public Works Official, June 13, 2011.

151The Jakarta Post. "Ministry focuses on Irrigation, Rural Roads." *The Jakarta Post*. March 16, 2005. The Jakarta Post. "Ministry Seeks Extra Money for Infrastructure." *The Jakarta Post.* June 2, 2005.

law do include farmer participation are poorly implemented and have yet to receive adequate attention from the central ministry.[152] Such a focus causes a number of problems in maintenance, as the government funding provided for maintenance of irrigation systems is inadequate with up to 85 percent of the funds being earmarked for employee salaries and administration.[153]

Reflecting this data, I value political vulnerability on irrigation issues as low after 2002. Without the pressure of the financial crisis, external donors lost their ability of influence the policy process. Farmers, in general, were never able to organize enough to place pressure on politicians and officials, at least at the national level. Also, despite repeated seasonal water shortages,[154] rising food prices,[155] increasing urban demands on water,[156] and problems with irrigation system maintenance, politicians have paid little attention to the water sector beyond accepting the advice and policy suggestions of the Ministry of Public Works for continued focus on infrastructure building and rehabilitation. As of 2011, no central government politician has faced the threat of losing their position due to action on irrigation policy since 2002.

The then-vice president Jusuf Kalla went so far as to promote more dam building

---

152 Interviews with local ministry officials and researchers, January-September 2011. See also Emilia, Stevie. "Implementation Lacks Guidelines." *The Jakarta Post.* June 23, 2010.

153 Abdulla, Rizka. "Long Way to Achieve Self-Sufficiency in Rice Production." *The Jakarta Post.* October 16, 2002.

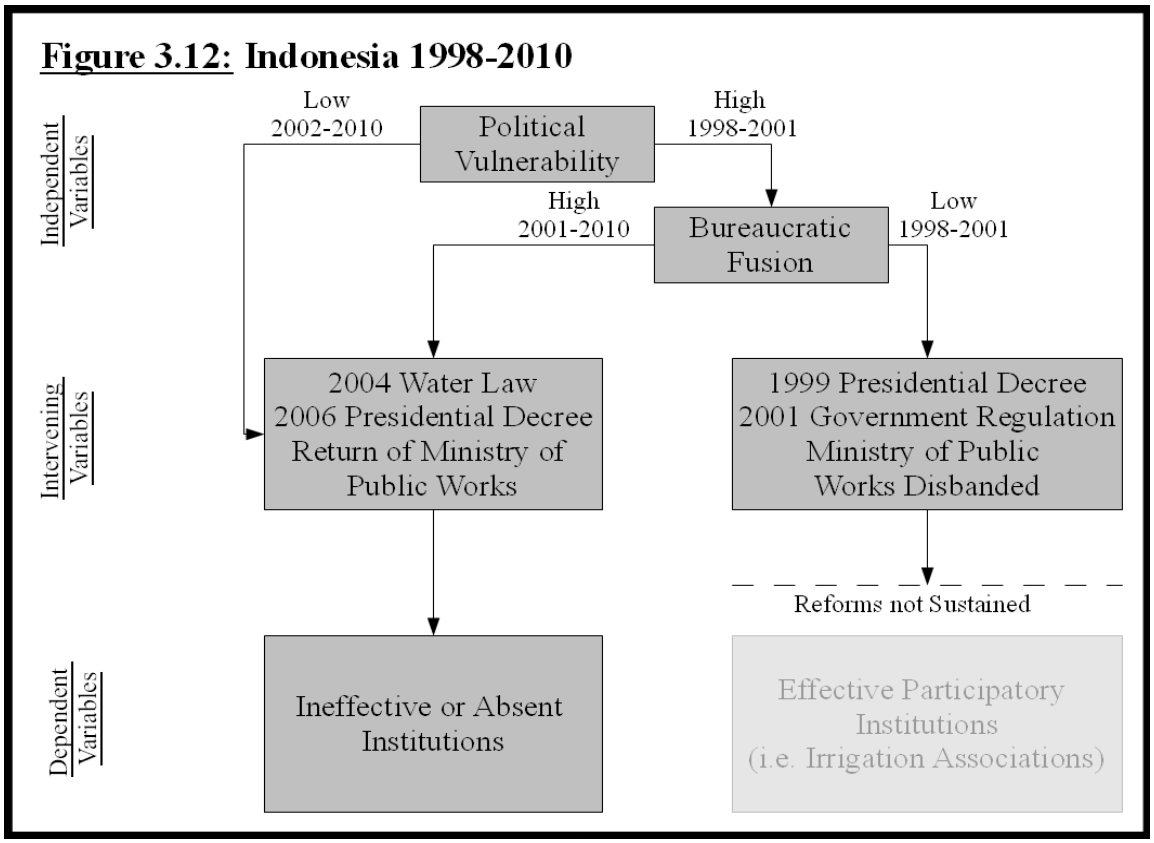
154 The Jakarta Post. "Official Issues Rice Production Warning." *The Jakarta Post.* February 12, 2008. Simamora, Adianto P. "Drought Severly Hits Rice Paddies." *The Jakarta Post.* July 24, 2009. Tri Suwarni, Yuli. "Hectares of Rice Fields in West Java Dry Out." *The Jakarta Post.* September 9, 2011. Saragih, Bagas BT. "Seven Reservoirs Drying, 20 on Alert: Agency." *The Jakarta Post.* September 18, 2011.

155 Adamrah, Mustaqim. "Food Prices 'to Remain High in Next Four Years.'" *The Jakarta Post.* September 26, 2008.

156 The Jakarta Post. "Water Demand to Increase by 44% in Next Four Years." *The Jakarta Post.* October 11, 2011.

as a answer to these issues after a 2007 visit to the Three Gorges Dam project in China.[157] Such a focus ignores a multitude of environmental and financial issues with continued infrastructural development while farmer involvement is ignored.

Figure 3.12 shows these values placed within my theoretical framework. Combining the two periods into one table (Table 3.2) provides a quick look over the evidence presented above.



The Indonesian experience demonstrates the role of an irrigation agency that controls the policy-making process. This fusion led to blocked policy reform in 1987 and a 2004 reversal of reforms accomplished during the brief respite from bureaucratic

157Suparno, Riyadi. "Kalla Urges More Dams after Visit to Three Gorges." *The Jakarta Post.* June 11, 2007. Interestingly, Indonesia has courted loans from China and the Middle East to support its dam-building projects rather than rely on the World Bank or the Asia Development Bank, presumably due to lighter requirements regarding farmer input.

fusion. We also see that, despite food security concerns, political vulnerability for irrigation in Indonesia has come from international donor pressure. While such pressure was able to encourage PIM development after the Asian Financial Crisis, it was unsustainable. Donor pressure was also ineffective in encouraging institutional development in the late 1980s.

Table 3.2: Variable Measures for Indonesia

	IV: Political Vulnerability	IV: Bureaucratic Fusion	Intervening Variable: Policy Reform	DV: National Participatory Institutions
1984-1998	Moderate	High	Initiated, but hamstrung by Bureaucracy	No
1999-2011	High (1998-2002)	Low (1998-2000)	Extensive	Initiated but Incomplete
	Low (2002-2011)	High (2001-2011)	Reversed	No

Country Study – Thailand

Prior to the 20th century, the most complex water user groups that managed irrigation systems in Thailand were found in the Northern portion of the country. These collective action organizations were supported by the local kings and lords who ruled in the area, and their organizational rules were granted legal authority.[158] Other areas had communities that experienced episodic mobilization for irrigation purposes, but generally the water resources in the countryside were sufficient for the subsistence farming that characterized peasant life.[159]

Irrigation, as an issue for state involvement, only became visible in the early 1900s. Thailand, unlike the other locations treated in this analysis, never experienced

158Vanpen 2006.
159Shivakoti 2003.

colonization. Despite being heavily influenced by Western powers, the Kingdom of Siam was able to maintain its sovereignty largely through the efforts and effective state-building moves of King Chulalongkorn who ruled from 1868 until his death in 1910.[160] Among the actions necessary to protect his country from creeping imperial interests was the development of a bureaucratic system, loosely based on European systems.

One such bureaucracy to emerge during this period was what was then known in Thailand as the Canal Department. Large-scale irrigation projects had begun under the management of a private investment company, the Siam Lands, Canals, and Irrigation Company, in the Rangsit area north of Bangkok in 1888. The "Company" (*Borisat*), as it was known, dug a number of canals in order to develop the land and make it suitable for agricultural purposes so that the company could sell it at a profit. The effort was not entirely successful, leaving many plots without adequate access to water.

Recognizing the need for better canal management, the palace hired a Dutch national, Homan van der Heide, to advise the government on canal design, construction, and maintenance. It was under Van der Heide's influence that the Canal Department was established in 1902. The agency was originally charged to manage the canals (*khlong*) which ran through the capital as well as oversee drainage and establishing locks to prevent brackish water from flowing upstream from the Gulf of Thailand and damaging crops.[161]

At the time, irrigation needs were far from the main concern of the Canal Department. Instead, the canals were primarily used as a means of transportation. Fitting

160For histories see Wyatt 2003; Pasuk and Baker 2005.
161See Brummelhuis 2005.

with this orientation, in 1910, the government renamed the department, and the new Highway Department was placed under the control of the Public Works Ministry. It was then charged with paving a number of the canals to facilitate road construction.

A few years later, through, irrigation needs moved to the fore-front due to droughts followed by floods in 1914. The Canal Department was reconstituted in the Ministry of Agriculture and charged with managing irrigation needs throughout the kingdom. In 1927 the Canal Department was renamed The Royal Irrigation Department which finally aligned its Thai name (*Krom Chonprathan*) with its English title.[162]

The Royal Irrigation Department (RID) proceeded through the next decades focusing on infrastructure development and central control of irrigation systems. Following the fall of the absolute monarchy in 1932, the Thai government was generally dominated by military elites, and the Ministry of Agriculture and Cooperatives, which housed the RID was no exception. In the 30 years from 1932 until 1962, a military official held the office of Minister of Agriculture and Cooperatives for approximately 22 years, almost three-quarters of the time. The Ministry was considered an especially lucrative post, with the RID department among its crown jewels. Approximately 60 percent of the Ministry's budget was allocated to the RID for construction and maintenance of irrigation infrastructure. Through an almost institutionalized system of graft, the department heads and government ministers benefited individually and collectively from infrastructure development projects.

The government's interest in rice production, and thus irrigation, was driven

---

162To foreigners the department had always been called the Royal Irrigation Department. See *The Nation*, "Royal Irrigation Department: Flowing New Life into the Barren Farmland." June 13, 1979.

largely by the rice premium, which lasted until 1985. The government held a monopoly on rice exports and levied taxes on rice in this manner, which maintained a low domestic price while generating revenue for urban development. The expansion of the land frontier and expansion of cultivated land under irrigation was the quickest and easiest way to develop more revenue.[163] The area under cultivation for rice increased from approximately 6.1 million hectares in 1961 to almost 9.9 million hectares in 2000.[164] With an abundance of land to be brought under cultivation, there was little concern for increasing efficiency, and Thai rice yields improved much more slowly than their neighbors despite the total amount of rice produced far outpacing all countries in the region.

Geopolitical events also strengthened the military's role in agriculture. As the Vietnam War progressed nearby, the military saw rural development as the key to preventing the rise of Communist sympathizers in the populace. Expansion of agriculture, especially irrigation, in the dry, heavily populated Northeastern Plateau became a regular chorus. The military believed that spreading irrigation infrastructure throughout the region could help win the “hearts and minds” of the people and prevent creeping Communism.

It was during one of these pushes for irrigation expansion that participatory irrigation management emerged. A regional irrigation office in Northeastern Thailand proposed that farmers gather together and form water user organizations to assist in operating and maintaining the irrigation infrastructure that had been built. The first

163Ammar 1995.
164 Data from FAOSTAT of the United Nations.

groups formed sometime in the mid-1960s in Northeastern Thailand.[165] By 1968 they were being introduced to the central plains.

Despite this push, the RID had little interest in promoting a fully participatory partnership with farmers, as they viewed farmers incapable of providing the necessary inputs. A statement written by a RID engineer in 1968 reflects this belief:[166]

> The burden of responsibility for canal operation and maintenance rests at present on the RID and an irrigation assessment is difficult in the light of the rice premium. The farmers, without any effective organization, do not have any sense of responsibility for canal operation and maintenance. The present period of time may be looked upon as a transition period during which farmers will be organized with government technical help.

The RID saw the new associations as a promising solution to the issue of organizing farmers to provide the labor necessary for irrigation projects, but the groups were a top-down initiative. Farmers were rarely consulted regarding irrigation decisions, and despite the claim that farmers were allowed to choose their own group leadership, irrigation engineers often stepped in and made the choice for them.

These first organizations established in the country were called Water User Associations (WUA).[167] The WUA envisioned by the RID had extensive responsibilities for distributing fertilizer, credit, and other farm inputs. This was paired with the assignment to operate and maintain some of the irrigation infrastructure at the local level.

165Different sources list creation dates differently. The earliest argue that water user associations were established as early as 1963, but others state 1967. If the groups were formed before 1967 they would not have held legal status as the 1967 Civil and Commercial Law established the guidelines for a water user group being organized under Thai law. See Wachiraporn 2010; Duncan 1976.

166Charin 1968, 247.

167 In Thai, *Samakhom Phu Chai Nam Chonprathan.*

Within a decade, though, the RID reconsidered its commitment to expand the number of WUA around the country. In 1979 the department deferred the creation of any new groups due to what they argued was the lack of appropriate farmer leadership and administration.[168]

Also during the late 1970s, the RID had changed its approach to working with farmers. The promise of large-scale irrigation projects in regions outside of the central plains had largely remained unfulfilled due to problems of topography coupled with poor operations and maintenance. The expansion of irrigated agriculture wasn't as effective as had been hoped. A new emphasis on small-scale irrigation projects was promulgated in the Fourth Development Plan in 1977. This shift also saw a shift in money to the small-scale projects. In the next two decades, approximately 200,000 million baht was spent on small-scale water resource development projects.[169]

During the 1980s, then, these small-scale projects dominated the scene, but they were largely developed without participatory methods. This happened despite the adoption of participatory rhetoric in both the Fifth (1981-1986) and Sixth (1987-1992) National Development Plans. Farmers were not involved in the design, operation, or management of the systems. Instead, the RID cultivated its role as the main provider of irrigation water and services, while farmers were relegated to the position of silent service recipients.

Participatory management reared its head again at the end of the decade as pressure from international agencies increased. At the same time, democratization was

168 RID 2010.
169 At about 20 baht to the dollar, this translated into approximately 10 billion US Dollars. TDRI 2002.

taking a stronger hold and the rural populace became a fertile resource for votes. Political leadership again promised to "green the Isaan." In other words, they sought to irrigate the northeast which held over a third of the country's population but little of its wealth.

At this time the RID sought to scale down its participatory efforts. Rather than Water User Associations, it focused on basic Water User Groups (WUG), which would include farmers in the on-farm portion of irrigation, or the point where irrigation water was turned out of the canals and into the farmers' fields. These basic groups were very limited in scope, they covered only about 1.6 square kilometers (395 acres) of ground at the most. Despite their small scale, they suffered from the same problems that plagued the earlier attempts at developing WUO. The WUG were merely the outcome of government efforts that did not effectively involve farmer participation.[170] The top-down approach failed to actually develop institutions that fostered a working relationship between farmers and irrigation agency officials.[171]

This approach lasted throughout the 1990s as Thailand's economy continued to boom. Then the Asian Financial Crisis arrived. On July 2, 1997 the Thai government floated the Thai baht, which led to a massive currency devaluation.

The economic shocks took their toll on the political system, providing an opportunity for political reformers to push forward a number of ideas which had been under consideration for years but had been unable to gain enough of a following to implement. This included a new constitution, which had been in the drafting stage since the early 1990s.

170TDRI 2002.
171Hoynck and Rieser 2002.

Beyond making major changes in the political institutions of the country, the new document also called for participatory management of natural resources, including water. Section 79 declared that the government was to encourage public participation in natural resource management while Section 84 of the document reads:[172]

> The State shall organise the appropriate system of the holding and use of land, provide sufficient water resources for farmers and protect the interests of farmers in the production and marketing of agricultural products to achieve maximum benefits, and promote the assembling of farmers with a view to laying down agricultural plans and protecting their mutual interests.

This approach was a vast departure from the state-managed orientation of the past.

The financial crisis also precipitated a major agricultural sector loan from the Asian Development Bank which mandated a number of bureaucratic reforms, including the expansion of participatory irrigation management in the irrigation department. The Thai government officially signed the loan agreement in 1999 and began implementing a series of reforms necessary for the disbursement of the loan. These included some pilot efforts at participatory irrigation management, including the establishment of Joint Management Committees for water management in 2001 and the creation of the Department of Water Resources in the Ministry of Natural Resources and the Environment in 2002.

The initial tranche of $50 million was disbursed in early 2002, but shortly thereafter, the Thai government canceled the loan program with $150 million left

172Section 84, 1997 Constitution of the Kingdom of Thailand.

undispersed. The government claimed that it was trying to minimize its external debt.[173]

Participatory irrigation policy, though, did not disappear with the ADB loan. Instead the Royal Irrigation Department continued to pay at least lip service to the concept, if not real attention. In 2004 the agency issued its Strategic Plan calling for more participatory management. The 2007 Constitution, which came into being due to its predecessor being abrogated during a coup in 2006, retained the participatory clauses found in the 1997 Constitution. Section 85 even states that the government is responsible for:[174]

> Preparing systematic management plan for water and other natural resources for the common interests of the nation, and encouraging the public to participate in the preservation, conservation and exploitation of natural resources and biological diversity appropriately.

Also, in June 2008 the RID promoted the department section of Operations and Maintenance to become the new Office of Public Participation Promotion, charged with ensuring that farmer organizations would continue to play a major role in the irrigation system. One agency publication stated that the establishment of this office demonstrated that the RID considered participation of the people to be the "heart" of their work.[175]

As of 2012, the Office of Public Participation Promotion (OPPP) had engaged in a number of activities to encourage more farmer participation in irrigation. Its main focus has been on the Integrated Water User Groups (IWUG), which are a conglomeration of the WUG and, ideally, have responsibility for operations and maintenance of secondary

---

173Abonyi 2005.
174Section 85, subsection 4. 2007 Constitution of the Kingdom of Thailand.
175RID 2011a.

canals. The OPPP also seeks to employ a number of farmer "volunteers" who function as intermediaries for farmer groups and the irrigation agency.

According to officials in the office, their hope is to move the RID from complete control over irrigation to an advisory position where farmer groups operate and maintain irrigation on their own. Currently the RID has established a number of policies to that effect but these policies are implemented unevenly and with little real change toward PIM on the ground.

Thailand Analysis

Before analyzing policy shifts in Thailand's irrigation, it is helpful to identify the major players in water management in Thailand and discuss their incentives. First, unless a major crisis forces politicians to take notice of water issues, a complicated network of bureaucratic agencies bear responsibility for most decisions regarding water management. Water policy is shared between as many as 38 different departments in at least nine ministries, as demonstrated in table 3.3. Of these, the most important policy actor in the irrigation sector is the Royal Irrigation Department. Other government agencies, including the Electricity Generating Authority (EGAT), National Energy Administration (NEA), the Metropolitan Water Administration, the Department of Water Resources, and the military, are also involved in determining irrigation management policy. In the central plains, water for irrigation is often considered residual after the needs for energy production are filled, determined by EGAT and NEA, as well as the provision of enough water to guarantee saline ocean water does not flow up river or into canals in the Bangkok area.[176]

176Christensen and Areeya 1994.

Table 3.3: Thai Government Institutions Involved in Water Management	
Ministry	**Department(s)**
Ministry of Agriculture and Cooperatives	Office of the Permanent Secretary Royal Irrigation Department Department of Agricultural Extension Department of Agriculture Department of Land Development Department of Cooperatives Promotion Department of Fisheries Department of Livestock Agricultural Land Reform Office Royal Rain-making Research and Development Institute
Ministry of the Interior	Department of Public Works Department of Local Administration Department of Town and Country Planning Department of Public Welfare Department of Community Development Office of Accelerated Rural Development Metropolitan Waterworks Authority Provincial Waterworks Authority
Ministry of Public Health	Department of Health
Office of the Prime Minister	National Economic and Social Development Board Office of the National Water Resources Committee Electricity Generating Authority of Thailand
Ministry of Industry	Department of Industrial Works Industrial Estate Authority of Thailand
Ministry of Communications	Department of Harbor Meteorological Department
Ministry of Science, Technology, and Environment	Department of Energy Development and Promotion Office of the National Environmental Board National Research Council
Ministry of Defense	Hydrolographic Department, Royal Thai Navy National Security Command Headquarters
Ministry of Natural Resources and Environment	Department of Mineral Resources Department of Marine and Coastal Resources Department of Water Resources Department of Groundwater Resources Royal Forestry Department Office of the Natural Resources and Environmental Policy and Planning Department of Pollution Control
Source: Chaiyuth 1999. Adapted by author to reflect changes since 1999. Although I list 38 departments in total, I have found no recent 'official' count. The Department of Water Resources Website states that at least 32 government departments are currently involved in water management. Accessed April 4, 2013. http://www.dwr.go.th/about/about-1-0-2.html.	

Politicians, the second set of policy actors in the irrigation sector, periodically become involved in irrigation management policy, but their efforts have rarely resulted in new legislation. As of writing, the legal framework is seriously out-dated. Laws that determine today's irrigation include the 1939 People's Irrigation Act, 1942 State Irrigation Act, 1962 Dykes and Ditches Act, and 1974 Agriculture Land Consolidation Act.[177] In the early 1990s, politicians made an attempt to develop a new water law, but the legislation fell prey to political deadlock. More recently, extensive flooding of Bangkok and the central plains that brought the Thai economy to a screeching halt in 2011 encouraged politicians to revisit the idea of a new water law, but experts have expressed little faith that this will result in actual legislation.[178]

Rather than shaping legislation, politicians have focused on locally-specified projects, such as lining canals with concrete or building infrastructure. Members of parliament are often approached by their constituents and asked to exert influence on the irrigation agency to obtain funding for projects in their home towns. Powerful politicians also compete to control the Ministry of Agriculture and Cooperatives and the Royal Irrigation Department to access the resources housed in the ministry.[179] These factors

177 The 1974 Agriculture Land Consolidation Act has very little to do with irrigation beyond approving the collection of irrigation service fees.

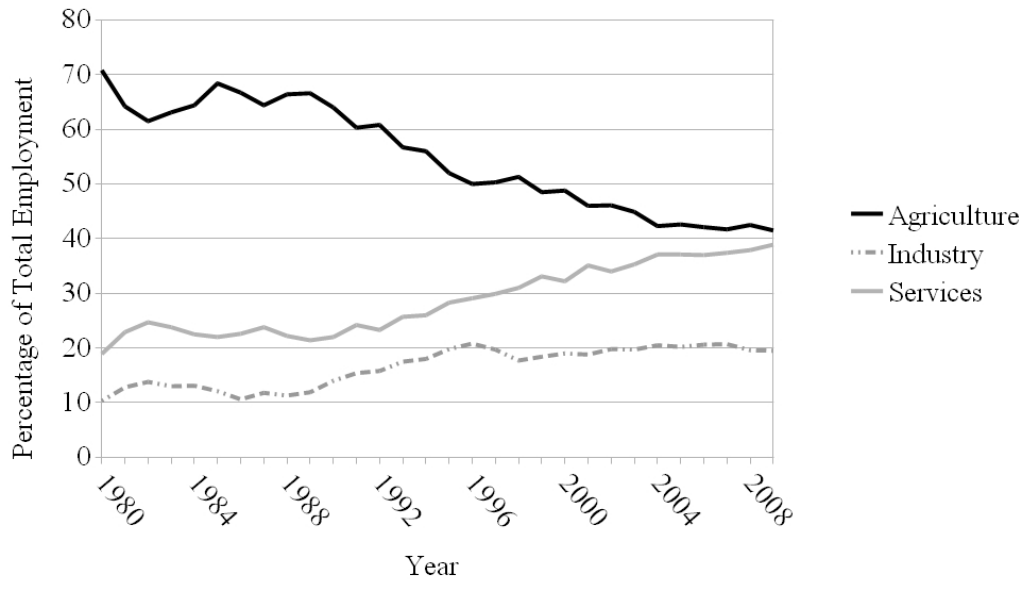
178Interview, Water Policy Researcher, Bangkok, Feb 3, 2012. The researcher remarked that the biggest obstacle to a new water law is opposition from various ministries and departments in the bureaucracy.

179Government ministries and departments in Thailand are graded according to their desirability for politicians to control. The Ministry of Agriculture and Cooperatives was a historically A-grade ministry, although it has recently fallen to B-grade status. The Royal Irrigation Department has also been a perennial A-grade department. In fact, its budget, size, and influence is larger than many ministries. Banharn Silpa-Archa, a former prime minister and former Minister of Agriculture and Cooperatives and a prominent politician, has heavily influenced the Agricultural Ministry, and thus the irrigation department, over most of the past three decades.
One interviewee described Banharn's influence, “During the dry season, I have heard politicians in Suphanburi (Banharn's home province) stand up and announce to the people that they need not worry about water. They'll get it when they need it. You can travel south along the river and see many areas dry. Trees brown and dying. Then you cross into Suphanburi, and you'll see how lovely it is. Green everywhere.” Interview, Researcher, Kasetsart University, Bangkok, February 8, 2012. See also

have led to an emphasis on infrastructure projects rather than policy changes.

The importance of these projects for electoral purposes is due to the demographics of Thailand. Throughout history, the majority of Thailand's people have been farmers. Even as late at the mid-1990s, well over half of the Thai labor force was involved in agriculture. Still, as of 2009, the agricultural sector employs more people than either industry or services with over 41 percent of the workforce. See figure 3.13. This is despite the fact that agriculture only makes up about 12 percent of the nation's GDP.[180] This disparity means that there are a large number of relatively poor farmers in the Thai population.

Figure 3.13 Thailand Employment by Sector



Source: World Bank World Development Indicators

Nishizaki 2011.

180 2011 number from World Bank World Development Indicators.

This dynamic has guided much of the dialogue regarding irrigation. Politicians, military leaders, and bureaucrats all see irrigation as one of the possible solutions to poverty among the rural poor, especially in the dry Northeast called the Isaan.[181] This irrigation pressure does not generally come from the people who use the water. Projects and promises flow from politicians and bureaucrats to the regions concerned, often regardless of the local peoples' needs or desires.

Reflecting the source of the policy, the creation and implementation of participatory irrigation management policy in Thailand has often been half-hearted at best. In this section, I evaluate the three variables of interest: political vulnerability, bureaucratic fusion, and the existence of effective water user organizations on a national level. I begin by evaluating Thailand's value on the dependent variable before looking at bureaucratic fusion and, finally, political vulnerability.

The first policies which could be considered PIM emerged from within the Royal Irrigation Department in 1963. Officials in the Isaan (Northeast) found that they needed some sort of farmer organization to encourage participation in irrigation development and management. These officials initiated Water User Association (WUA) organizations. These groups were first informally organized, then legalized. The initial group was established at a small reservoir in Udon Thani province in 1963. It was granted legal status in 1968 with others soon following.[182]

The WUA were charged with educating farmers about water, incorporating user participation in canal management and maintenance, minimizing conflicts, and providing

181 Of course a number of other reasons have also been cited for advancing irrigation. Sacha 2001; Molle et al. 2009.

182RID 2010.

a source of credit for farm equipment and fertilizer. An important component of these groups was the "common irrigator," an elected position which was meant to act as something of a water master, or coordinator of irrigation activities. In theory farmers would choose the common irrigator from among their ranks; in practice irrigation engineers intervened in the selection process as they felt farmers chose poorly.

These WUA were developed in a number of areas in the Northeast and the Central plains, but even by RID measures, they were never very successful. Within a few years, the irrigation agency decided to discontinue the practice of promoting the organizations. The RID found them too large to actually coordinate farmer behavior and develop communication between the agency and farmers.[183] From the farmer perspective, the organizations provided little in the way of goods or services. Instead, the common irrigator was seen as a tool of the RID who only said "no" to farmer requests. Because of this, farmers refused to pay their water fees to support him. The RID was left subsidizing his salary; an agreeable arrangement as it took less time and effort than setting up a functioning group.[184]

The 1974 Land Consolidation Act allowed for the legalization of water user fees, but there was no formal connection between fees and service provision. Farmers saw them as intrusive, and their relationship with the RID did not improve. By the mid-1970s, the RID turned away from the WUA organizations, and by 1979 the agency deferred establishment of any new groups.[185] The agency instead had turned toward smaller groups called *chaek* in the early 1970s. Unfortunately the results were similarly unsuccessful.[186]

183Molle, Nittya, and Saovakon 2002.
184Duncan 1976.
185Wachiraporn 2010.
186Duncan 1976.

In the 1980s, policy shifted toward basic water user groups, but the organizations were not given legal rights to water, nor were they given the authority to monitor and enforce organization rules. One independent report argued that the water user groups are "not indigenous effort but are merely outcome of government initiation and intervention. The staff of WUG also lack management skills that has led to inefficient management."[187]

The next major policy shifts came as Thailand reeled from the effects of the Asian Financial Crisis in the late 1990s, but again no effort was made to create legal rules which would give WUO the capacity to independently operate and maintain canal systems or formal authority to monitor and enforce rules within their own groups. The Royal Irrigation Department, despite an increased rhetoric of participation, made few actual changes to its administrative structure to encourage water user involvement in irrigation management.[188] Water remains the purview, and property, of the state; freely available to all, but without legal rights assigned to any.[189] This extended to infrastructure, with water users feeling that "[irrigation infrastructure] belongs to the government and users are therefore not enthusiastic in the up-keep of the projects."[190]

A few enterprising officials in the RID have tried to push participatory policies; they were successful in convincing top officials to establish the Office of Public Participation Promotion within the agency in 2008. The office, though, is often considered an afterthought, with its budget for participation promotion subject to seizure in the pursuit of infrastructure projects. Despite the office's existence for the past three

187TDRI 2002.
188Abonyi 2005.
189See Mingsarn et. al. 2001. Especially Chapter 20.
190UN 2006. Pp 31.

years, it has yet to receive official sanction from the government.[191]

Thus, in evaluating the policy framework, the Thai government has not engaged in institution-building necessary to encourage WUO. This is reflected in outsider evaluations of water user organizations, which have not been positive. One group of researchers cheekily implied that WUA in Thailand were dead with their paper subheading: "A Post-Mortem Analysis of Water User Groups in Thailand and the Prospect for Reincarnation."[192] Being more diplomatic, the UN argued that the effectiveness of water user groups was "not yet empirical."[193] The report went on to encourage more promotion of the organizations. The Asia Development Bank, when evaluating efforts to increase PIM under the auspices of the ASPL loan program (2001-2003), stated that farmer participation was "fragile and will require urgent follow-up."[194] Other researchers have also found that water user organizations were generally weak, with farmers choosing to engage in informal activity rather than take part in the organizations promoted by the state.[195]

Due to these two factors, a lack of policy framework for PIM and outsider evaluations of the weakness of WUO in Thailand, I place Thailand in the negative category on the dependent variable. The country does not have effective institutions for PIM. We should thus expect to find a high degree of bureaucratic fusion or a low degree of political vulnerability or a combination of the two.

In terms of bureaucratic fusion, Thailand has a long history of bureaucratic

191Interview, Head of the Office of Participation Promotion, Bangkok, March 13, 2012. The office was also assigned to become a complaint call center and handle public relations for the RID.
192Molle, Nittaya, and Savakon 2002.
193UN 2006, 134.
194ADB 2003b, 12.
195Hoynck and Rieser 2002.

dominance over politics. Beginning shortly after the overthrow of the absolute monarchy in 1932, the military began a long history of involvement in political rule. Military leaders developed links with elites in the bureaucracy that guaranteed military and bureaucratic dominance over the political system.[196] This role has continued, evidencing itself most recently in the 2006 coup.

During the 1960s, Riggs referred to Thailand as the "Bureaucratic Polity" although more recently experts have argued that it might be better characterized as a "Military Polity."[197] This influence was also felt in agriculture. As the RID made its first forays into PIM (1960-1973), over half the time, the head of its controlling authority, the Minister of Agriculture[198] was a military official. The other half of the time, the officials in charge of the ministry came from either the royal family or a bureaucratic appointment. [199] Prior to 1990, the year control over the Ministry of Agriculture and Cooperatives permanently moved out of military hands, the agency had close bonds with the most powerful actors in the Thai government. This translated into the linking of political interests with those of the RID; military officials used the agency to assign construction contracts to family and friends. The agency's affiliation with the military prevented any fear of close monitoring.

The RID has also historically faced little threat from bureaucratic purges, or even oversight. In fact, the agency is considered among the most powerful in the country. At its

196Chai-Anan 1997.

197Riggs 1966. Author interview with Bidhya Bowornwathana, expert on Thai bureaucracy. Bangkok, February 13, 2012.

198 The Ministry of Agriculture became the Ministry of Agriculture and Cooperatives in 1973.

199 Of the 59 Ministers of Agriculture and Cooperatives from 1932 until 2012, 16 of them were military officers. They held the post for 26.5 total years, with the most recent being Lieutenant Colonel Sanan Kajornprasart whose term ended in August, 1990.

largest, the RID had over 50,000 employees. In the post-Asian Financial Crisis era those numbers have moderated, but, as of 2009, the agency still commands over 30,000 civil servants and employees.[200] It also has a massive budget. From 1997 through 2002, in spite of the Asian Financial Crisis, the agency spent more than 30,000 million baht per year on the national irrigation systems.[201] In 2011, its budget was over 40 billion baht, which makes the department actually larger than a number of ministries.[202] Government departments in Thailand are unofficially ranked as A, B, or C grade according to their access to resources. The most valuable departments are important for politicians to preserve due to the fact that they are generally independent in their allocation of resources. The Royal Irrigation Department, with its control over contracts for infrastructure and its large body of employees, is considered one of the coveted A-grade departments.[203]

Within the ministerial portfolio, the department has no real fear of coming under scrutiny for its activities. Christensen and Ammar argue:[204]

> the concept behind Thailand's civil code is that the bureaucracy is to regulate individuals in society. This feature immunizes the bureaucracy from lawsuits against its arbitrary exercise of power, thereby giving officials considerable discretion to determine who wins and loses in the allocation of resources which are regulated by the state... Worse still, such discretionary power fosters an

200 2009 Annual Report, Royal Irrigation Department.
201 Tassanee 2005.
202 This made the department's budget larger than that of many ministries, such as the Ministry of Natural Resources (approsimately 23 billion baht), the Ministry of Labor (approximately 28 billion baht), and the Ministry of Justice (approximately 17 billion baht). See Bureau of the Budget 2011.
203 Bidhya 2001.
204 Christensen and Ammar 1993, 17.

attitude of dependency towards the bureaucracy among the citizenry, particularly in rural areas.

While recent changes and the establishment of the Administrative Court in 1999 have begun to increase monitoring over the bureaucracy, they have been slow to take hold.[205]

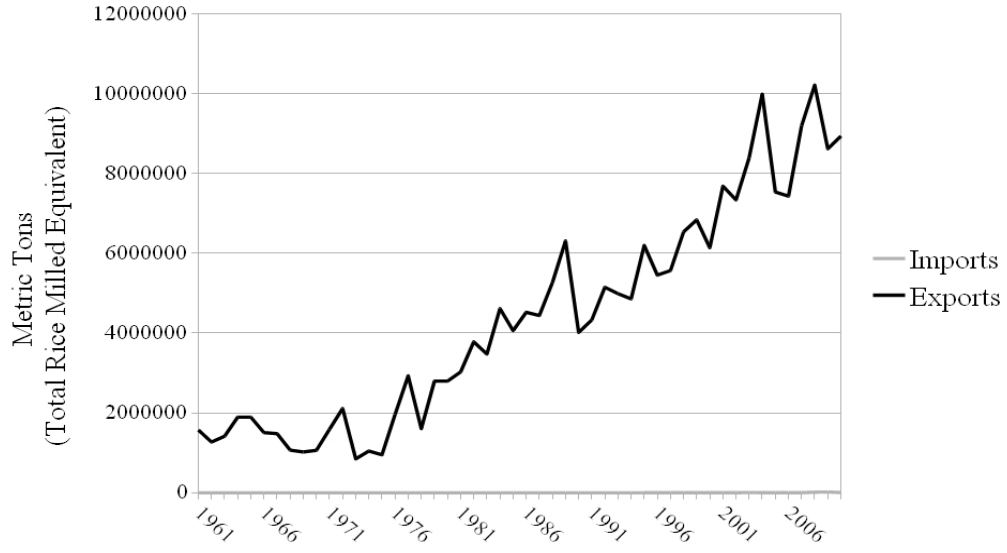
Because of these factors, I judge the level of bureaucratic fusion to be high in Thailand. This evaluation is supported by Bidhya's evaluation that the bureaucracy, at least until 1992, dominated politicians.[206] Since that time, top level bureaucrats have continued to play political roles. First as appointed senators from 1992 until 1997. Later they have become more inventive, including the practice of retiring bureaucrats to apply for posts as judges in the administrative courts.[207] The country is no longer a "Bureaucratic Polity," but the influence of the bureaucracy on politics remained strong throughout the time considered in my analysis.

Political vulnerability in irrigation has never really been high in Thailand. A vast land frontier with a relatively small population guaranteed that food was readily available. Water supplies, at least in the central plains, which have dominated Thai political life, have always been relatively abundant. Surplus rice production was one of the main drivers of the Thai economy, and the country maintains its status as the world's foremost exporter of rice.[208] Thus food security concerns have always been low as seen in Figure 3.14.

---

205 Bidhya 2011.
206 Bidhya 2005.
207 Bidhya 2010.
208 In late 2012 it lost this post to Vietnam and India, partly due to government rice pledging schemes that caused the government to stockpile stores of rice rather than sell them for a loss on the open market.

Figure 3.14: Thailand Rice Imports and Exports



Source: UN Food and Agriculture Organization Statistics

Despite this, politicians have often pointed to irrigation as an opportunity to reduce rural poverty. This, though, did not reflect vulnerability in irrigation. Rather it was an effort to reduce rural dissatisfaction with an ever increasing gap between the urban haves and the rural have nots. The efforts of the Thai state have been impressive, with poverty rates dropping dramatically from 96 percent of rural households in 1960 to about 10 percent in 2007. The Thai farmer is now relatively well-off when compared to peasants in other countries. One expert has gone so far as to declare them "middle-class" peasants.[209]

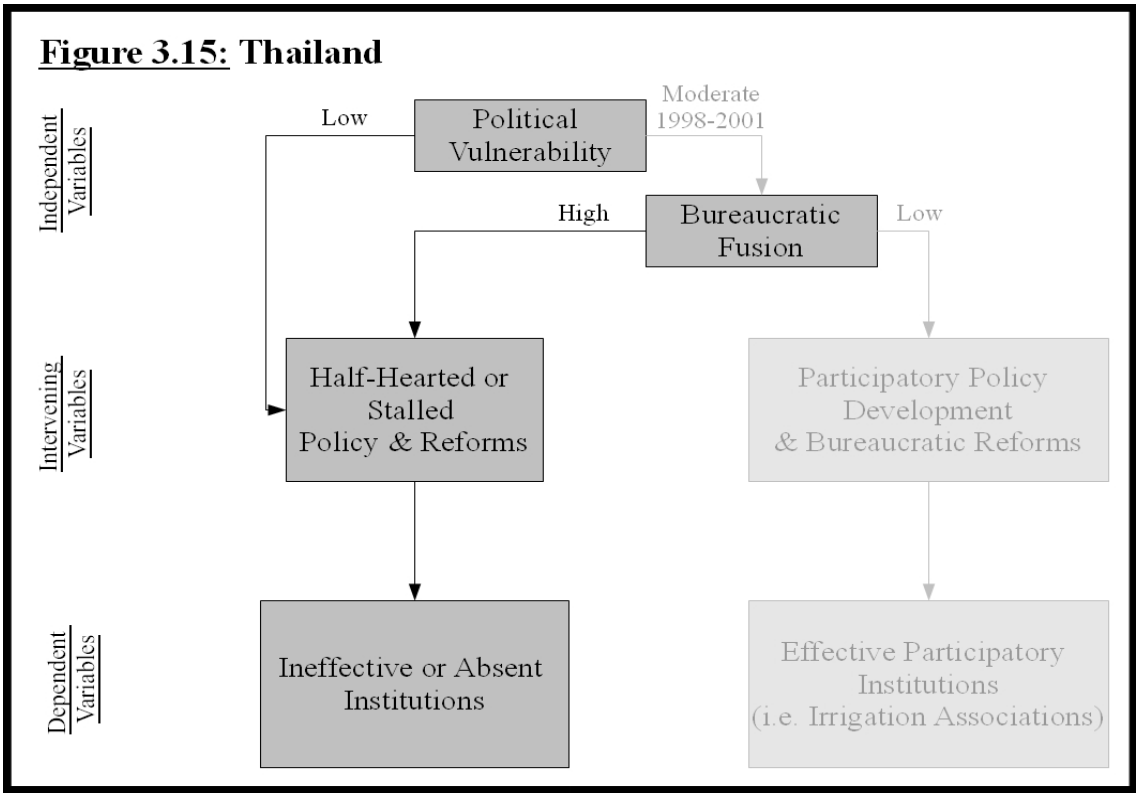
At only one point have politicians felt pressure to develop a greater emphasis on PIM. Following the Asian Financial Crisis, the agricultural agency relied on a loan from

209 Walker 2012.

the Asia Development Bank, which mandated new policies promoting farmer participation in irrigation management. The implementing agency, though did not face real reforms. Instead the government's efforts required minimal commitment and were reversible.[210] This pressure never actually threatened the tenure of political leaders.

I thus place Thailand in the low category in political vulnerability. With the combination of high bureaucratic fusion and low political vulnerability, the case fits well within the predictions of my theory, as shown in Figure 3.15.

Figure 3.15: Thailand



Thailand demonstrates how low political vulnerability in irrigation issues combined with a high degree of bureaucratic fusion prevents policy reforms. Despite some international pressure, the lack of true vulnerability has allowed the state to avoid engaging in reforms to make irrigation more efficient. The Royal Irrigation Department,

210 Abonyi 2005.

up until the implementation of the 1997 Constitution, was able to comfortably control the policy process in irrigation, avoiding most reforms which might hinder it. Since that time, the agency has faced greater constraints, but it remains firmly in charge of irrigation.

Conclusions

The four cases presented above provide support for the causal story developed in my theory. The emergence of PIM institutions depended on favorable political conditions, which included political vulnerability in policy arenas related to irrigation. This cause alone, though, was not sufficient to compel adoption of the institutional framework necessary for strong farmer-agency coordinating bodies. Politicians had to also be free from bureaucratic fusion with the irrigation agency.

In both Taiwan and the Philippines, water user organizations were cultivated by their respective irrigation agencies due to the policy framework and institutional reforms brought on through politicians' response to pressure. In contrast, the irrigation agency in Indonesia has exercised its policy influence to in the first place avoid reforms in 1987 and in the second rescind those which were enacted in the early 2000s. This occurred despite politician's feelings of insecurity due to a lack of food security and pressure from international agencies. Finally, Thailand has avoided reforms which might threaten its historical role as a construction-oriented agency. Instead, on the rare occasion politicians seriously consider irrigation policy, political leaders have developed half-hearted policy attempts which have created a number of paper organizations, but no real nation-level implementation of water user organizations. These findings provide no challenge to the hypotheses laid out in Chapter Two. This is demonstrated in Table 3.4 below.

Table 3.4: Country Comparisons

	Political Vulnerability	Bureaucratic Fusion	Effective Participatory Institutions
Taiwan	High (Food Security; Mainland Threat)	Low	Yes
The Philippines	High (Food Security; Financial Crisis)	Low	Yes
Indonesia	Episodic (episodic Food security; Financial Crisis)	High	No (Attempt made in 1999-2002)
Thailand	Low	High	No

Of course, these cases are not the last word on my theory. There is a fair amount of variation between the level of success experienced by each of the countries. Taiwan is much more effective than the Philippines in PIM, and the Taiwanese Irrigation Associations exhibit a greater degree of farmer participation. Both countries have also experienced significant policy changes as their political vulnerability to irrigation issues has waned. The Philippines' NIA after the early 1990s could no longer be considered a success at encouraging the development of institutions for PIM promotion. Thailand and Indonesia also experience variation, even though both have very low levels of participation. Using binary variables limits the ability of my analysis to capture this variation. An ordinal scale would likely provide a greater description of the dependent variable.

Even so, as a preliminary test of the concepts of political vulnerability and bureaucratic fusion, these cases are useful. They provide a causal stories for the source of

institutions created to address a specific development task largely in line with my theoretical predictions. Political vulnerability and bureaucratic fusion may provide additional leverage in explaining the source of such difficult subjects as agriculture extension, education, and business associations.

My theory also addresses a major lacunae in Ostrom's[211] solution to Hardin's[212] tragedy of the commons. Ostrom has argued that human groups are able to develop the institutions necessary to manage scarce resources, at least in small-to-middle sized communities. Yet her analysis does not address where the institutional framework surrounding those communities comes from.[213] As the state is involved in the management of most common pool resources, the theory presented here provides one possible source of the state frameworks which increasingly reach into community management of limited resources.

Finally, in studying these cases, we see that when a policy framework emerges to encourage street-level bureaucrats to work with farmers, water user organizations can be developed fairly uniformly nation-wide. This occurred with the 17 Irrigation Associations in Taiwan,[214] and it was underway in the Philippines, at least until the late 1980s.[215] In contrast, in states that do not develop a comprehensive policy framework of incentives for officials to collaborate with farmers, we observe a greater degree of variation in implementation on the ground. For example, Thailand's water user organizations are

211 Ostrom 1990; 1992.
212 Hardin 1968.
213 See Mansbridge 2010.
214 Lam 1996.
215 Lauraya and Sala 1995. This success, as noted, has been reduced significantly since the 1990s and has led to greater variation in water user organization performance. See Araral 2009.

generally quite weak.[216] Some scholars have even implied that they are dead.[217] Despite this, local Operations and Maintenance offices of the Royal Irrigation Department have taken home international awards based on their work with farmer groups to improve management of local systems.[218] I now turn to explaining possible causes of this variation.

The next two chapters take political vulnerability and bureaucratic fusion and apply them to the subnational level in both Indonesia and Thailand. Following these chapters, I will revisit the results of my cross national comparisons in the concluding chapter. At that time I will also discuss some of the other questions brought up in these comparisons, such as the interesting role of regime type in institution-building.

216 ADB 2003b.

217 Molle, Nittaya, and Savakon 2002.

218 United Nations Public Service awards have been granted to both the Krasiew Operations and Maintenance Office and the Mae Yom Operations and Maintenance Office in 2011 and 2012, respectively.

Chapter 4

Sub-national Variation in Indonesia

Background of Local Water Governance in Indonesia

As discussed in Chapter 3, the Indonesian government's first attempts at developing water user organizations began in the late 1980s and early 1990s.[1] In 1987, facing pressure from international donors as well as falling revenue from the oil sector, the government's Irrigation Operation and Management Policy directed that water user organizations bear more responsibility in system development and management.[2] At that time water user groups were largely established by the irrigation agency to provide labor for projects, although there was regular assurance to the international aid community that these water user groups would be involved in operating and maintaining irrigation systems. Farmers were expected to gather for canal digging, cleaning, and construction. They were not expected to contribute much more than labor for the agency while it continued to focus on construction projects. Many of the groups were merely paper organizations which quickly fell into inactivity a short time after formation.

At that time the Irrigation Agency, which was a part of the Ministry of Public Works, was in charge of promoting and managing these groups. The Ministry of Agriculture had their own farmer groups (*kelompok petani*, literally group of farmers), which they used for agricultural extension, fertilizer distribution, and crop promotion.

1 Native irrigation groups existed previously throughout Java and Bali. The Dutch colonial authority had destroyed many of them; Suharto's New Order government continued dismantling those in Java during its tenure until the 1980s. See chapter 3 for a more detailed discussion.

2 See Bruns 2004.

Administration of the groups was kept separate, despite the fact that the same farmer leader often served as the head of both organizations, a practice known by the farmers as "wearing two shirts." Local agriculture extension officers avoided getting involved in water issues, while local irrigation agents stayed out of issues reserved for the agriculture agency. Agents often even refrained from talking with each other.

Three levels of water user organizations were created. At the most local level are water user groups, or in Indonesian *perkumpulan petani pemakai air* or P3A.[3] These groups focus on water distribution at a tertiary canal, or most local level. Membership rolls range from a few to a few hundred farmers, depending on canal length, population density, and the area watered. A group of P3A can combine to become an Integrated Water User Group, *gabungan P3A* or GP3A. This level is organized at the secondary canal level and generally includes thousands of farmers. A group of GP3A can join together to become a Major[4] Water User Group, *induk P3A* or IP3A. This type of group functions at the primary canal level, but they are quite rare.[5] A graphic representation of this arrangement showing canals and areas under the jurisdiction of P3A and GP3A groups is provided in Figure 3.2 in chapter 3.[6] The IP3A organization would manage the entire area encompassed by the figure.

As Suharto fell in 1998 and the government embarked on a massive series of

3 Different areas in Indonesia have different names for these groups. In East Java they are called HIPPA, in West Java Mitra Cai, in Sumatera KP2A. I use P3A as it is the official government designation and was known in research areas.

4 *Induk* is most directly translated as mother or parent, but it can also be interpreted as main, chief, or major.

5 PU 2006.

6 This graphic is merely to provide an idea of how the administrative units match up with different canal levels for those unfamiliar with irrigation. It does not represent any real location, nor does it illustrate drainage canals, which are also a part of canal systems.

decentralization reforms placing most administration at the district level, authority over irrigation management also shifted. Control over bureaucracies, once the exclusive purview of central agencies, was shifted to the districts and provinces, which fragmented the previously unitary agencies. Implementation of laws and rules could now progress at different speeds and levels depending on the local context.

The national-level history is considered in greater detail in the previous chapter on national politics. In summary, the government turned water management over to farmer groups through Presidential Instruction number 3 in 1999. This legislation empowered Integrated Water User Groups (GP3A) to manage and maintain canals at the secondary level. It also gave them legal authority to enforce sanctions on farmers and water groups which refused to abide by water distribution rules. Operation, management, and infrastructure responsibilities for tertiary canals were distributed to the P3A units. While many groups around the country were not initially prepared for the new responsibility, some were able to engage in the work.

As the new policy was being implemented, though, forces in Jakarta were working to return control of irrigation systems nation-wide back to the central government ministries. The result was the 2004 National Water Law (UU No. 7 2004). This new law, and the successive Presidential Instructions in the ensuing years, returned control over irrigation management again in the hands of the bureaucracy, reversing many of the participatory efforts enacted from 2000 through 2006. This created the administrative and political environment wherein my field research occurred.

Currently administration over irrigation systems is divided between three

government levels in Indonesia. At the most local level, irrigation areas less than 1,000 hectares (approximately 2,470 acres) are the responsibility of district level governments. Those ranging from 1,000 to 3,000 (2,470 to 7,413 acres) hectares and those which cross district boundaries are assigned to the provincial government. Irrigation areas over 3,000 hectares and those which cross provincial boundaries are the responsibility of the central government.[7] This means that the government level responsible for construction, maintenance, and management depends on the size of the irrigated area. Even so, in practice the district-level civil servants are involved in working with the water user groups, even when those groups are assigned to the central government. District officials, though, are only accountable to the district government.

Also affecting the current water user climate is a new law (Presidential Instruction Number 38, 2007), which transfers responsibility over the P3A unit to the Ministry of Agriculture. The GP3A and IP3A organizations remain jurisdiction of the Irrigation Agency. At the time of my fieldwork, this law had barely entered the implementation stage, as the local agriculture agents had little knowledge of irrigation and they did not want to take responsibility for the P3A units. Irrigation agents, although no longer charged with the P3A, were often reluctant to abandon years of work. They also needed the P3A to function so that the GP3A could continue to serve as a water management coordinating body. Even so, they were no longer paid to work with the P3A, so the organizations are garnering less attention than before.

The administrative fragmentation has created a number of challenges and a great

7 In comparison, the average farm size in the US according to the 2007 Census of Agriculture from the Department of Agriculture was 418 acres or about 169 hectares.

deal of confusion for both private citizens and street-level bureaucrats. Even so, it provides an exemplary opportunity to compare policy implementation within the national boundaries, and my research plan was designed to take advantage of these circumstances. Against this backdrop I entered Indonesia and began my case selection. My research took place largely at the district level in two provinces: the Yogyakarta Special Administrative Region (DIY) and in East Java. In DIY, my research focused on comparing a series of case studies to irrigation groups in three districts: Bantul, Sleman, and Kulon Progo.[8]

Selection of Comparative Cases

Recalling the research design presented in Chapter Two, I was interested in comparing districts in their policy support or implementation regarding these water user organizations. Unfortunately standardized evaluations of water user groups in Indonesia do not exist. While the government requests that the irrigation agency carry out such evaluations each year as part of the annual water user group contest, local agency officials have neither the time, will, nor resources to evaluate each unit.[9] With a small district containing hundreds of P3A groups, measures of each unit are often limited to local official's individual judgment of how well the unit works or doesn't work. This means units which have close relationships with the bureaucracy are generally considered more effective than those without, regardless of their role in water distribution.

Despite the fact that there are far fewer GP3A in each district, officials still do not

8 Indonesia's administrative structure refers to these as *kabupaten*. Many Indonesian sources translate this administrative unit as a regency, while others use district. I prefer the appellation district as local officials are elected rather than appointed, as the term regent might suggest. Regency also calls to mind the era of Dutch colonial appointments.

9 A lack of standardized evaluations of water user groups can be taken as a clear indicator of the importance given this policy issue by the Indonesian government. Governments count what they feel is significant. See Scott 1998.

carry out regular standardized evaluations of each unit. Instead they provide evaluations, again, based on agency officials' relationship with the group and subjective judgments.[10]

International funding agencies such as the World Bank and Japan International Cooperation Agency (JICA), have largely relied on these evaluations of the institutional strength as well as field visits. To my knowledge, no one data set exists objectively evaluating all the water user groups in the areas I conducted research.

Thus case selection involved obtaining suggestions from the irrigation agency combined with input from local researchers.[11] I requested suggestions for both functioning and non-functioning groups. I then visited the suggested groups, talking with local leaders about their own evaluation of their group's effectiveness. I also asked some primary questions designed to measure both the capacity of the leadership and the effectiveness of the group. Based on agency official evaluations, farmer leader evaluations, and the responses to those questions, I chose four GP3A units to study and three P3A units to study in DIY. Despite the general aversion current in political science to choosing cases based on the dependent variable, I began with outcomes in order to trace the "causes of effects."[12] In other words, I was interested in explaining observed outcomes rather than the effect of a number of variables on an outcome. Table 4.1 provides my evaluation criteria used to determine the level of success of a group.

---

10 The most recent nation-wide evaluation of water user associations was made in 2004, but irrigation officials in Jakarta hesitate to use this information as they don't believe it reflects reality on the ground. They also complained that collection efforts were difficult, and many districts and provinces either failed to report information or provided only partial information. In private conversations, the officials also admitted that much of the data was probably falsified by local officials.

11 For a deeper treatment of my case selection methods, see Chapter Two.

12 Mahoney and Goertz 2006.

Table 4.1 Indonesian Water User Group Evaluation Criteria

	Successful	Less Successful
Irrigation Agency Evaluation	Agency categorizes group as developed (*maju)*	Agency categorizes group as underdeveloped (*belum* OR *sedang)*
Local Researcher Evaluation	Local researcher subjectively says the group is successful.	Local researcher subjectively says the group is unsuccessful.
Water User Group Funding	At least 70% of water users have paid fees to the group in the past 2-3 years. The group may also obtain funding from local governments (village, district).	Water user fees are not paid. Group is unable to appeal to local government for funding. Money comes from irrigation agency.
Conflict Management	The group is able to diffuse conflicts among water users over water.	Conflicts are common and must be referred to the irrigation agency or local government.
Water Distribution	Carried out by farmer volunteers.	Managed by irrigation agents or local government.
Effective Leadership	Leaders knew the approximate number of farmers in their group, the amount of area their group had authority over, and basic facts regarding the formation of the group.	Leaders were unable to provide basic information about their group.

Along with this measure of my dependent variable, I also chose cases according to a number of control variables. I chose groups of comparable size, climate, topography, water availability, and cropping patterns within the same district to hold these variables constant. As far as I was able I held these constant across districts as well.[13]

Two GP3A were chosen from Bantul district, another two were chosen from Kulon Progo. One successful group was chosen from each district to be paired with one relatively less successful group. I also visited P3A units in both districts. The three P3A units were all from Sleman district. Two were successful, one was not. I also visited

13 I faced constraints regarding the reality that water user group size was determined by canal type and length, which I could not always control for.

GP3A organizations in Sleman.

Originally I had planned to only focus on one layer of water user organizations, the GP3A. This was due to the fact that in conducting research on a GP3A, I was easily able to access information on P3A. The opposite was not always true. GP3A were also larger organizations, most of them with thousands of members. The coordination involved is much more dependent on the institutions in place rather than being explained away by social capital or small transaction costs. Finally, the number of P3A was almost overwhelming. Over 900 exist in the three districts I focused on, many of these groups of only a few members. In contrast, only about 70 GP3A units exist in the same area. The difficulty in identifying appropriate case studies made the GP3A a more logical choice.

As I sought to identify case studies in Sleman, though, I met an interesting phenomenon. The GP3A in the district were almost uniformly less successful despite the irrigation agency's efforts to paint a few of them as more effective, but the P3A were among some of the most successful in the country. The geography of Sleman, on the slopes of Mount Merapi and its more recent efforts in developing GP3A, combined with its proximity to the provincial capital had rendered large scale irrigation groups (GP3A) less effective. Instead, the irrigation agency had focused its efforts on working with P3A. Some of these organizations had recently become very active and effective, winning national awards for their work. Because of this, I chose two groups next to each other high on the slopes of Merapi. One successful, one not. I chose a third group, which exhibited a pattern of success at the south end of the district on the flood plain, allowing me to control for crop type, topography, and climate within the same administrative

region. See table 4.2 for the major characteristics of each of these groups as determined during case selection.

Table 4.2 Case Study Characteristics

	District	Topography	Size	Crop Pattern	Water Availability	Farmer Occupation	Level of Success
GP3A Satuhu	Bantul	Flood Plain	2,853 farmers 419 Ha 11 P3A units	Rice/ Palawijo*	Scarce during third season	Farming combined with outside work	High
GP3A BW	Bantul	Flood Plain	2,235 farmers 602 Ha 15 P3A units	Rice/ Palawijo*	Scarce during third season	Farming combined with outside work	Low
GP3A Pengasih Barat	Kulon Progo	Flood Plain	6,992 farmers 1,323 Ha 21 P3A units	Rice/ Palawijo*	Scarce during third season	Farming combined with outside work	High
GP3A Pekik Jamal	Kulon Progo	Flood Plain	6,300 farmers 1,032 Ha 15 P3A units	Rice/ Palawijo*	Scarce during third season	Farming combined with outside work	Medium
P3A Sido Mulyo	Sleman	Mountain side	603 farmers 90 Ha	Salak Fruit	Abundant	Farming	High
P3A SR	Sleman	Mountain side	86 farmers 23 Ha	Salak Fruit	Abundant	Farming combined with outside work	Low
P3A Madu Warih	Sleman	Flood Plain	386 farmers 88 Ha	Rice/ Palawijo*	Scarce during third season	Farming combined with outside work	High

* Palawijo can be any number of off season crops, depending on current prices and farmer preference (peppers, melons, cassava, soybeans, etc)

I used these evaluations to facilitate comparing the process of water user organization development and promotion across districts. As is demonstrated by the case studies below, the comparisons across districts were much more drastic than those within districts. A less successful group in one district can actually exhibit a greater degree of cohesiveness and farmer-agency cooperation than a successful organization found in a neighboring district. This is due to the fact that responsibility for administration (*de facto*) sits at the district level, thus the irrigation and agriculture agencies within a single district tend to treat all the water user organizations in the district with a similar level of care, provided resources are sufficient.

Along with these case studies carried out in DIY, I conducted field visits to water user organizations located in East Java. These were known by the name HIPPA (*himpunan petani pemakai air*), but they were administered by the government in the same manner as the P3A in DIY. Because of distance and limited time in the area, I was unable to conduct equivalent case studies in East Java. Even so, I was able to conduct a number of field visits and interviews with officials and farmers. Thus I use the information garnered from the province as supplementary to the analysis conducted in DIY and as a check on whether the effects of political vulnerability and bureaucratic fusion is the same in other provinces.

Variable Measures

My dependent variable measures are indicated above. They were the first measures I took of my cases, as I used the dependent variable score to identify cases.

Once I identified cases, I sought to identify the institutional structures which

determined whether or not the case was a success. I also set out tracing how those cases had developed into the organizations that they are today. I was paying special attention to both political vulnerability and bureaucratic fusion as indicated in Figure 4.1, a replication from my theory chapters.

Figure 4.1: Theoretical Expectations

	Little to Moderate Political Vulnerability	**High Political Vulnerability**
Low Fusion	1. No Change - Status Quo or Vague Policy, Status Quo Institutions	2. Success - National Institutional Reforms
High Fusion		3. Reform Foiled - Status Quo Institutions

In my cases, though, I soon found that measures of local bureaucratic fusion, or the degree to which the bureaucracy controls policy at the local level, were basically the same in all my DIY cases. These included answers to the following questions:

1) Are local politicians elected or appointed?
2) Do local politicians depend on bureaucratic approval for projects?
3) Is the bureaucratic salary paid by local governments or by the central government?
4) Do local bureaucrats feel as though they are directed by local politicians?

Answers to these questions indicated that in DIY, street-level bureaucrats in the irrigation and agriculture offices were under the control of district political figures. Local politicians were elected through open, competitive elections in which a number of candidates competed. As bureaucratic salaries were controlled by the district head's office

(*Kantor Bupati*), street-level public servants were generally quick to pay attention to the district head's policy positions. Their influence in the local political process was limited to submitting advice in regards to local laws and policy implementation. They had no control over politicians.

This neutralized the effect of bureaucratic fusion in my local-level analysis in DIY. This artifact of the Indonesian decentralization scheme placed all my cases into the "Low Fusion" categories (Box 1 and Box 2 on Figure 4.1). Thus political vulnerability became the main explanatory variable I was investigating.

I identified political vulnerability through a series of measures:

1) Electoral competition at the local level.
2) Resource limits, especially in regard to revenue and number of bureaucrats available.
3) The existence of indigenous farmer organizations or connections to pressure government.
4) The length of time a politician or official had been a resident of the community.
5) Statements by politicians regarding irrigation or agriculture in reference to their office.

I found data on these issues through interviews with local officials and farmers. I also checked reports, bureaucratic records, and local newspapers for indicators that an official might feel vulnerability on irrigation issues, especially regarding the water user groups.

At the same time I also sought to identify any variables which may have not been initially included in my analysis. As noted in Chapter 2, many scholars have attributed

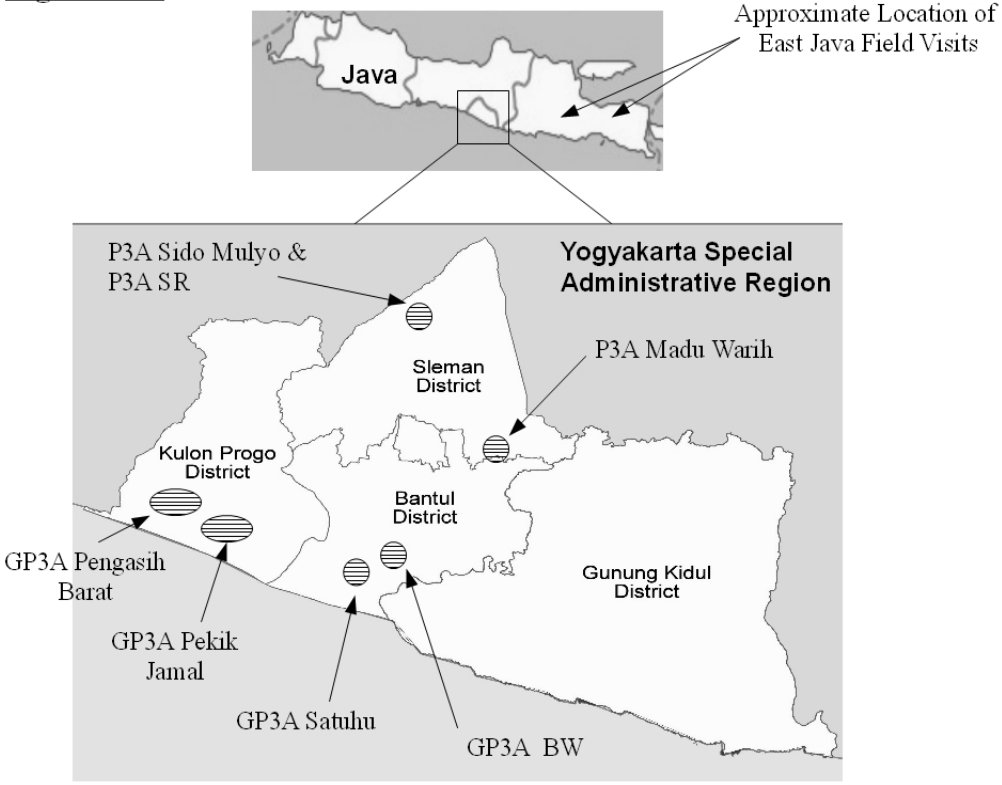
institutional reform to the role of a certain individual, such a bureaucratic leader.[14] Thus my research reflected special attention to the role of specific individuals among these groups. This included not just asking about the role of a specific individual, but also trying to determine the structural or institutional constraints which affected how the individual acted.

Because my cases were paired according to district administration, my discussion of the cases will link them in that manner. I begin with cases in Bantul district, south of Yogyakarta city. I then discuss cases in Kulon Progo district, to the west of Bantul. Third I discuss the cases in Sleman, directly to the north of Yogyakarta city. I then provide an analysis of my findings in DIY. Finally I compare my findings in Yogyakarta to observations made in East Java province.

A map showing the approximate location of my case study locations is provided in Figure 4.2.

14 Korten & Siy 1989; Ostrom 1992.

Figure 4.2: Research Locations



Bantul Cases

Bantul district is directly south of Yogyakarta City. The district covers approximately 506 square kilometers, the majority of which are lowland plains. Most farmers in the region rely on gravity-fed irrigation canals which draw from a number of rivers running through the area, the most prominent including Progo and Opak.

The population of Bantul is growing rapidly, with most growth being concentrated in the urban areas. As of 2010 over 910,500 people call the district home, an increase of approximately 100,000 since 2000, and that number continues to increase. More farm land is being converted for housing and urban use. In 2009 alone, over 50 hectares (123

acres) were converted from agricultural land to urban use.[15] The share of agriculture in the economy is also shrinking. It dropped to less than 24 percent of the district economy in 2010.

Despite the waning influence of agriculture in the area, Bantul remains an important rice producer. The central government continues to encourage the district to focus on rice production, especially as the current government's policies include returning to self-sufficiency in rice. The provincial government has also expressed concerns as the rural population, especially farmers, trails economic growth in the urban sector.[16]

Bantul is home to 35 GP3A units and 313 P3A, but irrigation officials classify only a few of them as successful. Thus my case selection strategy focused initially on those few units the government officials considered successful. Even among these groups I found a great deal of variation. Eventually, I chose cases from within the short list of those the civil servants proposed.

Bantul Case: Satuhu

Bantul boasts itself as home to one of the most successful water user organizations in Indonesia. Despite suffering heavy damage in the 2006 Bantul earthquake, the Satuhu GP3A represented the DIY province in the nation-wide water user organization contest that year. Locals argue that if it weren't for the earthquake, they would have placed first in the contest.

Since that time the organization has been widely touted as an example for water user groups around the country. Local researchers refer to the head of the group as a

15 BAPPEDA 2011. Local researchers assert that this is not a correct estimate. Rather it is just the land which was officially reported to the district office as having been converted to urban use. The actual land area removed from agricultural production should be much, much higher.

16 Yogyakarta 2005.

"celebrity," as he has been invited to travel to locations throughout the archipelago to talk to farmers about strengthening their water user groups. Farmers and government officials have also visited from other islands to observe the group. International visitors from Afghanistan, Thailand, and Japan have also made the trek to see the organization.

The farmers in this area, though, were not always this successful at water management. In the 1990s the area was plagued by constant problems as farmers took water out-of-turn. Water shortages were common, as were conflicts. Smaller constituent units, the P3A, had been established by the government through programs begun in the 1980s, but they did not coordinate with each other. Nor did they punish defections. During the later 1990s, conflicts became more severe as the water groups at the head of the canal continued to take more water than was allowed, leaving those at the tail-end without enough for their crops. One of the local irrigation officials who had worked in Bantul since the 1980s explained that this amounted to water stealing or *mencuri air*.[17] In order to prevent it, up to 40 or 50 farmers from a downstream area would work together to constantly monitor the stream of water as it flowed down the canal. Such efforts were becoming increasingly unfeasible.

After one particular conflict, leaders of the P3A in the area decided to appeal to the government for advice. Under direction from the irrigation agency, the 11 P3A units which shared the same secondary canal established a GP3A on March 18, 1998. Originally its name was Sido Mulyo to reflect the name of one of the villages in the area.

The group combined the management of over 18 tertiary canals across three villages and two sub-districts into a single organization. Initially, though, it was not very

17 Interview, Irrigation Official, Bantul District, Yogyakarta, March 8, 2011.

effective. Despite all the farmers in the area being listed as “members,” their membership existed only on paper. The P3A had been established through top-down government commands. As one local official said, “the government said what should happen [in P3A], and the people did it.”[18] This left many farmers confused as to what water user groups were and what benefit it provided them to be involved.

During the early years of the Satuhu organization only about 30 percent of the farmers in the area were willing to pay the minimal water fees required from membership. Rules established to resolve water conflicts were quickly put to the test as farmer conflicts occurred again in 1999. The organization's leadership reacted. Formal sanctions were imposed against violators, which resulted in better compliance but ill-will within the group. The organization learned from the experience.

Since 2000, the GP3A has used informal conflict resolution to negate the need for formal sanctions. Instead the organization focused on asking the offending parties to apologize and repair the damage done to canals rather than limiting access to water or monetary sanctions. Even with this learning going on, local officials and even farmers didn't consider the early years of the organization to be very effective.

A turning point apparently occurred in 2002 when the initial head of the organization decided to step down. At that point the vice-head of the organization was elected to fill the vacant post. Since the reorganization, the group has progressively increased its activities and its effectiveness in water management. By 2004, 100 percent of farmers in the organization were considered active in paying their water fees and being involved in association meetings at the local levels. Local officials and farmers were

18 Interview, Irrigation Official, Bantul District, Yogyakarta, March 8, 2011.

excited to promote the group for the nation-wide water user group contest in 2006.

Just as the organization was preparing to compete in the contest, though, a 6.2 magnitude earthquake struck just outside of the district capital Bantul on May 26. Over 5,500 people died with many homes collapsing; those structures that remained were heavily damaged, including homes in the Satuhu area. The organization's office, located in one of the villages next to group leader's home, was completely destroyed. The earthquake also cracked the cement-lined canals throughout the irrigation system. The organization lost members, infrastructure, and homes. It could not recover rapidly enough to make a decent showing in the July competition, which remains a sore spot for the members of the organization. Rules prevent them from re-entering the contest for quite some time after an initial run.

The damage from the earthquake also prompted the local government to declare a land tax holiday for farmers in the area from 2006 through 2008. At this point the GP3A also revoked water user fees as farmer incomes fell drastically and reconstruction costs mounted. Rebuilding infrastructure would rely completely on assistance from outside.

Despite this major setback, the organization continued to improve. When the World Bank's Water Resources and Irrigation Sector Management (WISM) program entered Bantul district in 2007, it came first to the Satuhu organization. The group was chosen because of its previous level of success working together with the irrigation agency and its prior ability to operate and function independently. From there the WISM program spread to the other GP3A organizations in the district.

Currently, the organization continues to function at a comparatively high level.

While water user fee collection has not yet returned to its pre-2006 levels, the organization is making headway. Fee payment has returned to relatively high levels, from zero collections after the earthquake until 2008 to over 70 percent of farmers paying their fees in full in 2010. Water management and distribution functions well, with the organization operating and maintaining the secondary canal with relatively little input from the irrigation agency. The organization head related, "despite the fact *Dinas* (irrigation agency) doesn't give us an operating budget, we can take care of the canals with our own funds."[19] Thanks to the water management efforts as well as promotion of water-saving techniques by the group coupled with the agriculture agency, all farmers in the organization are able to plant rice twice a year as they desire. The third planting season is limited to *palawijo*, or off season crops.

Beyond canal operation and maintenance, the organization has also begun to promote other economic activities for its membership. The organization office hosts seedling cultivation for peppers. It also has organized community mushroom farming with a mushroom shed built at the group's office. The farmer's wives are active participants in these small-scale economic activities.

The water user group has also served as a platform for farmers to collectively negotiate farming contracts with the Unilever company. Over the past few years, they have contracted to grow at least 15 hectares of black soybeans for the company for use in producing *kecap* or sweet soy sauce popular in Indonesia. Unilever has left the contract open for expansion of soybean production, but the agriculture agency is pushing farmers toward rice production through fertilizer and seed subsidies. Despite this, the relationship

19 Interview, Farmer Leader, Bantul District, Yogyakarta. February 17, 2011.

between Satuhu and Unilever is strong. The organization has also obtained a contract for milk production, which benefits its membership.

Bantul Cases: BW[20]

Despite it being the location of one of the most successful water user groups in the country, Bantul is also home to many, many less successful groups. Of thirty-five GP3A in the district only a few mirror Satuhu. Even those which are promoted as successes by the irrigation association have major shortcomings. A short distance to the north from Satuhu is the area managed by the GP3A BW. It is one of two water user organizations that sharing a canal system.

Much like with Satuhu, the component P3A were established by the irrigation agency during the 1980s and 1990s. By the end of the 1990s, the agency decided it was time to establish a GP3A in the area to coordinate the smaller water user groups. On August 6, 1999, the organization was officially established with its basic rules (*aturan dasar / aturan dasar rumah tangga*) written according to the irrigation agency's advice and leadership.

This combined 15 P3A covering about 14 kilometers of canals. The canals stretch through eight different villages and cross boundaries between three sub-districts. Coordination between water users in this area is vital as the length of the canals creates numerous opportunities for water thievery and management failures.

When the group was founded, the leadership was chosen from the leaders of the P3A organizations. Despite regular elections every five years, the leadership has not

20 I have changed the name of this group to BW to preserve its anonymity and protect its members from embarrassment.

changed since 1999. One leader stated during an interview that the it was the exact same organization as when it was founded. The same farmer leaders who were chosen twelve years ago remain in the same positions. They complain that no one wants to replace them, as the young people don't see any benefit from service. The complaints also are focused at the irrigation agency, as farmer leaders feel as though the agency should be compensating them for their service.[21] Irrigation officials, in contrast, argue that the organization, in order to be independent, needs to rely less on the agency.

In 2002, the government sent a community organizer (*pendamping masyarakat*) to teach the water user organizations in the area to become more independent. Community organizers, paid by the Regional Body for Planning and Development (BAPPEDA), focused on teaching the organization leaders how to develop and conduct meetings as well as engage in activities related to the institution, such as leadership training. The community organizers continued to work in the communities for four years, finishing their contracts in 2006.

As in Satuhu, the 2006 Bantul earthquake had a strong effect. Approximately 700 meters of canals were destroyed, as well as many homes in the area. The GP3A has taken a strong role in the recovery effort, overseeing reconstruction efforts funded by the central government.

In 2010, the district irrigation agency sent another community organizer to help the GP3A become stronger.[22] The most recent organizer assigned to the group said that most of his work has focused on helping the organization write proposals for construction

21 Interview, Farmer Leader, Bantul District, Yogyakarta, April 27, 2011.
22 Personal Communication, Community Organizer, Bantul District, Yogyakarta, April 27, 2011.

and repair work. He also sought to encourage increased activity among the leadership.

Based on recommendations from community organizers, in 2011 the BW group was promoted by the irrigation and agriculture agencies to the provincial contest for water user organizations.[23] Despite the efforts by the group and the government to have it be recognized as a success, the organization suffers from some major flaws that prevent it being considered a complete success. During frank discussions with farmers, they readily acknowledged that the organization did not function as well as presented. One leader said when evaluating the rules of the group, "we have rules, but they don't function (*jalan*)."[24] He also stated that the organization operates only about 50 percent of the time.

Instead the group's success in the government's eyes more likely comes from the background of group leadership. Most of the groups' leaders are retired bureaucrats. One is a retired army officer. Others are retired civil servants from the local government. This background provides them with experience navigating the bureaucracy. It also means they are more educated than the average farmer. These benefits afford them with the tools necessary to apply for benefits available through the bureaucracy. They are able to access a small amount of monetary support from village governments, but most of their funding comes from district government and the irrigation agency.

These benefits, though, are generally limited to construction and maintenance. Managing and operating the system is still problematic. One female farmer at the downstream end of the canal complained, "during the dry season we have to have 50 people watching the whole length of the canal all the time; otherwise others take all the

23 Agency officials were supposed to use standard evaluations of all GP3A in the district to decide which ones to promote for the contest. They did not.

24 Interview, Farmer Leader, Bantul District, Yogyakarta, April 27, 2011.

canal water and none reaches our village."[25] The downstream groups pay approximately 1.5 million rupiah (about $175) extra in bribes each year to guarantee their water access. Also water schedules for the area are relatively static, they have remained basically the same since 1977. This is in stark contrast to the Satuhu group where water schedules are constantly being adjusted according to current conditions.

The group has also been slow to promote other economic activities for farmers.

Bantul Cases: Analysis

Looking at these two organizations, a number of institutional difference stand out which seem to have provided opportunities for success for the Satuhu while BW still struggles with the basics of operations and management. These institutional innovations include a greater degree of transparency in the Satuhu organization. Their books are well-kept and available for agency and farmer perusal. Meetings are well-advertised as are water user rights. At each water diversion point, water user rights and responsibilities are posted. The water plan is not generally posted as it changes too frequently according to needs for continual re-posting, but farmers are kept well-informed of the dates and times that they are able to access water.

Second, the Satuhu organization has a system for monitoring and sanctioning farmers who have violated the rules. While the most extreme sanctions, such as cutting off water supply or imposing monetary fines, are rarely implemented, the water leaders do engage directly in conflict management. Their approach is to use private shaming and the threat of public shame to encourage farmers to abide by the water rules. The Satuhu organization also has an organization-owned hand tractor available to members who have

25 Personal Communication, Villager, Bantul District, Yogyakarta, April 18, 2011.

paid their fees. Refusing farmers access to the hand-tractor and other GP3A activities serves as a strong sanction against defectors. In contrast, the BW organization is troubled with regular water thievery. Sanctions exist, but they are not imposed.

A third innovation which encourages farmer participation is the organization's moves to encourage further economic activities for farmers. Inclusion in contracts for milk or soybean production require active membership. As does participation in mushroom farming and seedling development. This provides a concrete and clear signal to farmers that the organization does provide a material benefit for membership. Such club goods are missing in the BW organization.

A fourth institutional link is that between the organization and the village governments. Satuhu's relationship with two of the three village governments is exceptional. The village officials are members of the organization, and they frequently attend meetings of the group. They have received training from the irrigation agency on the benefits of P3A and GP3A. The head of the GP3A also regularly visits village leaders and reminds them of the importance of supporting the group. They assist in organizing community participation in canal maintenance (*gotong royong* or *kerja bakti*). They also provide some financial support for GP3A meetings. While BW is able to encourage some minor financial contributions from villages in its area to the tune of 100,000 rupiah per month (about $11.75), the organization doesn't experience nearly as much support. The personal relationship between the organization and the villages is not strong. Instead the organization relies on the irrigation agency.

So where do these innovations come from?

Satuhu's turn toward effectiveness occurred during a leadership shift, which put Pak L at the head of the organization. Since that time, he has exhibited a great deal of interest in promoting the group and making sure that it was effective. The irrigation agency, due to lack of manpower and social ties, left Pak L to direct his group as he desired. He used social pressure and personal connections with village leaders to provide more support to his group. After this support was acquired, he used it to develop the social structure of the group through supporting routine meetings and activities that provide visible benefit to farmers. Construction projects, although important, are secondary to operations and management for the GP3A.

This contrasts to the leadership in BW, which has used past experience in the bureaucracy to turn to the government agencies rather than the villages. While they do extract a small amount of support from villages, they are not as concerned with their relationship to village governments. Rather they focus on applications to the irrigation agency for infrastructure development. They have established goals to line the entire length of their canals with cement through government grants.

With bureaucratic fusion being low in Bantul district, as discussed in the introduction above, my theoretical explanation of this variation relied on political vulnerability. If my theory were correct, I would expect to see political vulnerability and government encouragement having occurred in Satuhu's case prior to the organization's advancement, while I would expect it to be missing in BW's case. There is some evidence that village government leaders are more vulnerable in Satuhu's area than in BW's. They are elected officials tightly embedded in the communities they live in. Village leaders are

very aware of Satuhu's needs and assist in its development and promotion. They face social pressure from farmers to contribute to the organization.

But temporally, the sequencing is problematic. It seems as though the Satuhu organization became active prior to the politicians feeling any pressure to improve irrigation. Or if they did feel vulnerability on irrigation, this did not translate into promoting the water user group until after Pak L became the leader and started strengthening the group to pressure them. During an interview, a local bureaucrat argued that the villages in Satuhu support the group because the group was already functioning.[26]

Thus in this case, it seems that the effect of political vulnerability at the village level was miniscule.[27] Instead evidence points to the role of the GP3A leadership as the main driver of success. Thus one individual volunteer, Pak L, who focused on the organization was able to promote its effectiveness in water management in collaboration with the irrigation agency. In contrast, individual leaders in BW turned their attention to extracting resources from the irrigation agency.

While such individual approaches may explain success in one group, translating them into institution-building is difficult. Instead the organization's functionality is dependent on that individual's continued capacity, interest, and willingness to sacrifice for the organization. To provide a brief counter example, during field research in 2009, I

---

26 Interview, Irrigation Official, Bantul District, Yogyakarta, March 8, 2011.

27 To make this more clear, it is important to pay attention to the timing of village leaders' activities with the GP3A. During the early years of the GP3A's existence (1998-2003), village leaders were not very involved with the organization. It was only after leadership changed in 2003 that the GP3A became effective. Shortly thereafter the local villages began to support the group. Once the group was well established, village leaders realized it was important to support the organization. Political parties have even approached the group seeking its support, although the group, as of 2011, had decided to remain neutral in regard to party affiliation.
Interview, Farmer Leader, Bantul District, Yogyakarta, February 17, 2011; Interview, Farmer Leader, Bantul District, Yogyakarta, March 8, 2011.

came across what local researchers claimed was a promising farmer's forum for irrigation management in Yogyakarta. The local government seemed to support it, as well as researchers from local universities. It, though, like the Satuhu group, was dependent on the leadership of one farmer.

In 2011 when I returned to the area and tried to contact the group again I found that it had become completely inactive. Shortly after my 2009 fieldwork, the head of the organization contracted lung cancer and passed away. Within less than a year the entire institution had fallen into inactivity and obscurity.

Already Pak L is in his seventies. Although he is not alone in the GP3A leadership, none of the other leaders appear ready to take the reigns if he were no longer able to perform. A reliance on exceptional individuals for organizational success is problematic.

What about political vulnerability felt at the district level?

Of the 35 GP3A found in Bantul, only a few are considered active or successful. Irrigation and agriculture agency officials are not engaged in systematic training programs for water user groups. Thus, district-wide, we do not observe much institutional innovation. If my theory is correct, this would mean that the Bantul government should feel little political vulnerability in irrigation issues.

The Bantul district government does face a number of pressures. The irrigation agency suffers from severe labor shortages compared to previous experience. Officials repeatedly complained that their on-the-ground staff was severely limited because of hiring restrictions imposed by the district. As older officials retire they are not replaced

despite the rapidly growing number of retirees. Yet the labor shortage has not translated into a reliance on water user groups to pick up the slack. This contrasts with other districts, as will be demonstrated below.

Politically, the district holds contested elections, although the fact that the district head remained unchanged from 1999 until 2010 when his wife replaced him in office raises some suspicion about the actual competitiveness of the elections.[28] In the elections, though, irrigation was not an issue, as water resources are generally sufficient during most of the year. 2010, the most recent election cycle, was also an especially wet year, allowing farmers to plant a third crop of rice rather than revert to dry season crops.

Economically, agriculture is the largest sector in the local economy, amounting to almost one-quarter of the district's production. Even so, agriculture is losing ground to the communication sector, commerce, and services. Also, irrigation does not figure in the district government's policy statements on agriculture promotion.[29] Instead the local government is focused on poverty alleviation through subsidizing seed and fertilizer to farmers. It is also trying to push for economic development outside of agriculture as it promotes the areas which border the provincial capital.

Thus it seems that despite the fact that the irrigation agency suffers from manpower shortages, the district government does not suffer from political vulnerability in irrigation. Because of this, little attention has been paid to PIM promotion in the irrigation agency. Most decisions about irrigation governance are made within the agency with little to no input from farmers, from where to focus on infrastructure construction to

28 District heads are limited to two terms.
29 BAPPEDA 2011.

water distribution decisions. While there is some policy space for farmer groups to act if they chose to do so, as the case of Satuhu shows, the irrigation agency does not actively promote such action. What success is experienced occurs due to localized individual efforts. This appears to be in line with my theoretical predictions.

Kulon Progo Cases

The Kulon Progo district is located to the southwest of Yogyakarta city. It is approximately 586 square kilometers in area, and encompasses a variety of terrain. In the north, the district is mountainous and relatively dry. In the south are the lowland plains, which is where a majority of the rice production takes place. Most farming relies on gravity-fed irrigation systems.

Approximately 375,000 people live in the district, with agriculture being the biggest employer. Over 46 percent of the population is full-time employed in agriculture, [30] although that number is an underestimate as many employees in other sectors also maintain small farms. Civil servants and farmer leaders estimated the number at closer to 80 percent of the population being involved in agricultural activities.

Water user organizations in Kulon Progo benefit from a history of activity and effectiveness uncommon to other districts. Much like in Bantul, the P3A were originally established according to central government programs in a top-down manner. At the time the government was focused on maintaining the massive infrastructure it built during the push to attain self-sufficiency in rice. After the goal was attained in 1984, government officials realized that the infrastructure needed to be operated and maintained, which they were not prepared for. That pressure, combined with the influence of international

30 Kulon Progo 2010.

investors, led to the 1987 Irrigation Operation and Management Policy, as mentioned above. By 1995 the majority of the 240 P3A in Kulon Progo had been established in line with the policy.

In the 1990s, the government also implemented an initiative called *Program Pembaruan Kebijakan Irigasi* (Renew Irrigation Policy Program). Kulon Progo was chosen as one of the main sites for implementation. The irrigation agency was charged with finding ways to work with farmers. Then Presidential Instruction number 3, 1999 was enacted. This ordered irrigation be turned over to farmers.

Facing both a decreasing pool of manpower and pressure from the district government to be responsive to farmers, the irrigation agency took this opportunity to encourage the creation of GP3A units throughout Kulon Progo. Initially 13 units were created, although two were eventually merged together. I focused my research on two of these organization, both found in the Kalibawang Irrigation Area, bordering the ocean.

Case selection in Kulon Progo followed suggestions and my own evaluations. In stark contrast to the other two districts studied in Yogyakarta, finding a less successful group was more difficult than anticipated.[31] While the other districts have a plethora of poorly functioning organizations, Kulon Progo has a history of active water user organizations. Even so, after meeting with almost all of the GP3A heads, I was able to select two cases for research capturing the variation in the district.

Kulon Progo Cases: Pengasih Barat

One of the groups created after Presidential Instruction 3, 1999 was the Pengasih

31 It is important to note here that none of these groups are completely independent. When I judge them as successful, I use the criteria found in Figure 4.1. This does not mean that the groups are flawless, nor does it mean that they could function completely independently of the irrigation agency.

Barat GP3A, which shared its canal system with the Pengasih Timur GP3A.[32] The organization includes 21 P3A spread over 19 different villages and over 1,000 hectares. The organization is the final downstream unit to access water from canals before they dump their contents into the Indian Ocean.

The misfortunes of size and geography, though, have not prevented Pengasih Barat from becoming an effective and efficient body for water management.[33] Farmer leaders report that over 95 percent of the 6,000 plus farmer members are active in paying their water user fees and contributing labor to *gotong royong*, or voluntary service to clean the canals. Water coordination is efficient and rules for monitoring for water thievery and clear and well-understood. The organization is also active in promoting the System of Rice Intensification (SRI) and the use of organic fertilizers, which decreases water demand while improving yield.

The group is also well-recognized nationally, and in 2009 it placed second in the nation-wide water user association contest.

Beginning in the early 2000s, the group was legally assigned responsibilities over management of canals. Those legal rights included the ability to limit access to water for farmer groups which failed to pay their fees or stole water. The organization, though, chose to avoid this type of confrontational enforcement.

Instead, the farmer leaders worked in close contact with the irrigation agency to develop a series of rules and leadership measures which gave the organization legitimacy in the eyes of farmers and ensured its authority over water distribution. One of the local

32 *Barat* means west, while *timur* means east.

33 Some would argue that a downstream location is actually conducive to a functioning water user group. In contrast, increasing the size of the group diminishes its effectiveness.

bureaucrats was credited with most of these innovations, which he developed from working in the field for years.

For Pengasih Barat these included a blanket rule that farmers were not allowed to access the canals after dark. In the hours after dark until about about 5:00 am, only farmer leaders and irrigation officials were allowed to travel the canal banks. Thus farmers, if they needed assistance after dark, would contact the closest farmer leader. Also, if they saw anyone on the canals after dark, they would report it to the farmer leadership. This sharply reduced the amount of water thievery along the length of the canals. It also made farmer's lives easier, as they were no longer required to spend the night minding their canals in fear of losing access to water. It helped, as one farmer said, turn water from a "hot issue" to a "cool issue."[34]

Other rules which emerged from this interplay between irrigation officials and farmers included a requirement that leadership for the organization include farmers from both upstream and downstream. The method of collecting water user fees was developed by the irrigation official in consultation with farmers. They found that collecting water fees in the field was more effective than collecting them from farmers homes. The collector, the head of an irrigation block or *ketua blok,* is allowed to keep 30 percent of the fee as payment for collection before turning it over to the organization. Initially this was capped at 10 percent, but through trial and error, the officials and farmer leaders found that increasing this allowance provided for better fee collection.

Also, the organizations were encouraged to work closely with village governments through irrigation forums, which also serve as a platform for the

34 Interview, Farmer Leader, Kulon Progo District, Yogyakarta, June 7, 2011.

organization to request funding when necessary.

Leaders in the water user organizations also received training on how better to deal with bureaucracy. They learned their legal rights and responsibilities, as well as what kinds of opportunities are available when working with the government. One leader explained it to me with a football[35] analogy: "We don't wait for the ball to come to us. We have to go to the ball."[36] He then explained that as the laws have changed and the responsibility for the P3A moved to the Agriculture Department in 2008-2009, the P3A within Pengasih Barat have quickly applied for help available through the agency. In 2010, they were the recipients of three grants from the Agriculture Department.

These institutional developments allowed the water user organization to become very effective in the years between 2001 and 2006. In 2006, though, the new national water law was implemented, removing responsibility over secondary and primary canals from the hands of the water user organization. Also, their legal rights and responsibilities for enforcement of the association rules were taken from them. Thus, if a water user was found to be taking more water than he or she was allowed, the organization no longer had power to fine that user or diminish their access to water.

Fortunately for Pengasih Barat, the new rules and enforcement mechanisms they relied on were not affected. As they have initially eschewed using formal punishments, the organization's water management capacity has remained remarkably unchanged. The farmer leaders do complain that their organization now is only able to legally play a consultative role, but the GP3A has been able to continue its close relationship with

35 Soccer in the United States.
36 Interview, Farmer Leader, Kulon Progo District, Yogyakarta, June 7, 2011.

irrigation officials and manage water resources.

Also in 2006, the organization was included in the World Bank-funded WISM project, which included training for farmer leadership in institution-building. The conditional loan from the World Bank continued funding training and farmer projects until 2010. At that point, each of the provinces taking part in WISM were re-evaluated and judged according to their ability to take part in WISM II, which continues funding the training and projects until 2014. The Kulon Progo district cleared the bar for inclusion in the second level project, but at the time of my last interview in the area (September, 2011) the funding from WISM II has yet to be distributed from the central government. Despite the failure of the money to find its way to the farmer group, it has continued to function.

Another change occurred in 2008 as the head of the Pengasih Barat GP3A was chosen by the irrigation agency to receive a paid position as a consultant for all the water user organizations in the district. This required that he resign his post as water user group leader, which potentially could have been disastrous for the organization. Instead, though, the GP3A has continued to function with a relatively high degree of effectiveness. In fact, it went on the following year to place second in the national water user association contest. The group continues to manage water distribution, collect water user fees, conduct regular meetings, and coordinate farmer cooperation.

After receiving their award in the 2009 national water user group contest, the group leadership decided to re-invest in the group. They purchased a hand tractor which can be rented by members of the association. The money from tractor rental is then used

to support water user group activities. This provides two boons to the group. First is a monetary benefit. The second is to create a club good, wherein the tractor is only available to active members of the organization.[37]

Pengasih Barat's success is well-regarded by outsiders as well. The organization has been studied in a few local master's theses as well as outside researchers, and a number of farmer groups from other areas in Indonesia have visited to see how it functions. The group benefits from both formal and informal institutions that were created through close partnership with the irrigation agency.

Kulon Progo Cases: Pekik Jamal

In stark contrast to conditions in the Bantul district, finding a less successful GP3A in Kulon Progo was more difficult than anticipated. Among Bantul's 35 GP3A units, only two or three could be considered successful according to the criteria laid out above. Kulon Progo's 10 GP3A units would almost all fit in the effective category. At least they all did until recently.

When I asked irrigation officials to point me toward a GP3A which was lacking in the categories, they told me that the group which most clearly failed in two major categories (water fee collection and resolving conflicts) was Pekik Jamal. They then expressed displeasure at the central government's policies which they argued were to blame for the group's recent poor performance. Prior to the implementation of the 2004 Water Law and its ensuing legislation, they considered the organization very effective.

Following the pattern of all the GP3A in Kulong Progo, the organization was

37 For most members, though, this is more of an imagined club good than a real one. If the tractor were employed every day for a year, it could not be used by the vast majority of the 6,000-plus organization members. Even so, knowing that it is a good that is available allows the farmers to envision a benefit from membership in the group.

established in 1999 under direction from the district government and some instructions from the irrigation agency. The head of the organization was emphatic to point out that the group was not established by the irrigation agency. Once the leaders of the local P3A learned from irrigation officials that they could organize to coordinate water distribution and canal operation and management, they applied directly to the district head (*Bupati*) for approval and funds. Together they realized the benefit of coordinating crop plans across the entire canal system so that all farmers would have sufficient access to water. During its initial years the group was not particularly influential, but following the full implementation of Presidential Instruction 3 of 1999 the organization became active in managing and distributing water.

The group brought together 15 P3A from nine different villages across 15 kilometers of canals drawing their water from the Sera River. Also included are five P4A (*Perkumpulan Petani Pengelola Pompa Air* – Group of Farmers Managing a Water Pump). The P4A use canal-fed wells to pump water to their members. These farmers are in areas near the ocean where gravity-fed irrigation provides insufficient water pressure for water to reach fields. The GP3A helps them with coordinating access to water from the canals and with pump maintenance.

In 2001, as the GP3A became active, it worked closely with the irrigation agency, taking a number suggestions, much like the leadership in Pengasih Barat had done. Water user fee collection became widespread, and the group rapidly took responsibility for canal operation, management, and maintenance. Money from water user fees was applied to canal repairs as well as supporting the organization's regular activities.

The organization had regular meetings every *Kamis Wage*, which occurs every 35 days on the Javanese calendar. They also had yearly meetings, and leadership were readily available to work with farmers and respond to concerns. Leaders also felt comfortable requesting irregular contributions from farmers for unexpected events or extra repair costs.

The water user organization leadership relied on the legal authority which the 1999 Presidential Instruction had given them. When a farmer group refused to contribute their water fees or labor for activities, the GP3A would shut its water off or levy a fine against it. These punishments were also used for water stealing. This contrasts to Pengasih Barat's efforts to avoid this kind of confrontational enforcement.

From the years of 2001 through 2006, the organization became almost entirely independent from government control and funding. Consultation continued with the irrigation agency, but the group no longer relied on infusions of money from the government agency. Water user fees were sufficient to pay costs for meetings, most minor canal and pump repairs, and small honorariums for leadership. Leaders coordinated crop plans and water distribution schedules between the P3A units and were able to act as a go-between for farmers with the irrigation and agriculture agencies.

The group also served as a minor lobbying organization for farmer interests at the district level. The district head's (*bupati*) home was within the boundaries of the organization, and leadership in the group were well acquainted with him. They were able to, through both formal and informal meetings, pressure him to recognize the importance of GP3A organizations. In response, the district head spoke to the agriculture agency and

irrigation agency on behalf of the farmers. He mandated that they pay better attention to the farmers and their organizations.

Unfortunately, though, forces in Jakarta were churning plans to remove legal authority from farmer organizations and return them to government agencies. When the 2004 Water Law was implemented in Presidential Instruction Number 20 in 2006, Pekik Jamal lost its legal authority to punish farmer groups who defected.

Farmer and P3A defection happened almost immediately. The new water fee collection rules left the GP3A at the mercy of the P3A units and their willingness to share water fees with the organization. In the years following 2006, P3A units diminished their remittances to the GP3A. While payments did not completely halt, they have dropped to half or less of their previous amounts. The GP3A also lost its capacity to manage conflict between units and reduce water thievery as it no longer had legal authority to enforce association rules and guidelines. Instead it has had to rely on irrigation agency officials to mediate issues. Recently problems have become common between fish farmers and rice farmers competing to access water from canals; the GP3A has been unable to force the two sides to talk.

During an interview, the head of Pekik Jamal speculated that the organization's fall from grace was due to its initial independence from the government.[38] By relying only on funding from the water user fees rather than continuing to focus on finding government assistance, they were unprepared for those funds to disappear once legal authority for water management and enforcement was removed from the group. The loss of funding is a symptom of the institutions that the organization relied on. Rather than

38 Interview, Farmer Leader, Kulon Progo, Yogyakarta, August 12, 2011.

developing informal institutions and close links with village governments, the organization relied on formal methods of sanctioning such as levying fines against groups and farmers who violated organization rules. These fines carried the threat of legal force. When the legal status of the GP3A changed, the group was unprepared to adapt.

Association leadership was forced to fall back on its informal contacts with the district head. The head of Pekik Jamal, backed by the other GP3A in Kulon Progo appealed to the district government for help. They presented their case before the district head and the district legislature. As the head of Pekik Jamal was also the vote canvasser for the district head in his area, he was able to pressure the government for support. The GP3A leaders argued that without government support, their organizations would quickly become ineffective. Through lobbying the district government, they were able to secure 5 million rupiah (approximately 500 USD) per year to support their organizations. Each GP3A has received the subsidy for the past three years. The money is ear-marked for institution-building; thus it is to be used in paying for regular meetings, honorariums for leaders, and training for leadership.

While the support is important for all the GP3A, it is merely supplementary to the money garnered from water user fees. This still leaves Pekik Jamal short on cash. The group has reduced its regular meetings to once every two months rather than every month.

Also, the P3A within the unit openly question its utility now. It has been unable to effectively solve conflicts occurring between fish farmers and rice farmers. These conflicts often involve village governments which tend to side with fish farmers who

wield a disproportionate amount of economic power in the conflict.

The GP3A has lost a significant amount of influence and effectiveness since the 2004 Water Law was implemented. Despite continued close contact with the irrigation agency, the water user organization has been unable to recover from the loss of its sanctioning power. Its relationship with the villages within its jurisdiction are not sufficient to convince them to provide extra funding for the organization, nor is its relationship with the farmers yielding resources needed for the group to continue.

Kulon Progo Cases: Analysis

In a sharp departure from Bantul where our story began with two poorly functioning groups one of which eventually became effective through the leadership of its head officer, Kulon Progo presents two cases where the water user organizations could be considered effective during the mid-2000s, but due to changes in the central government's policies, one became less effective. Early efforts at building GP3A by the irrigation and agriculture officials seemed bound for success. It was only after a massive institutional shift from the central government that a few of the GP3A have lost their institutional capacity for managing and operating water distribution.

So where did these initial institutional structures come from? According to my theoretical predictions, I expected to find political vulnerability in irrigation issues as the impetus behind these institutional innovations.

The close relationship and institutional development between the irrigation agency officials and the farmers has grown over the past few decades thanks to a number of pressures. First, the irrigation and agriculture departments in Kulon Progo were facing

major resource shortages. According to officials in the Agriculture Department, their organization has only about 50 percent of the manpower needed to accomplish the tasks they are assigned.[39] Thus they see a need to rely heavily on voluntary contributions by farmers. Beginning in the late 1990s, the irrigation agency began to suffer from labor shortages. During the late 1980s and early 1990s, the district office had over 200 employees, the majority of which were devoted to the field. On average, for every 1,500 meters of canal, the agency had one *juru air* or water master, the most local-level civil servant in the agency. Today the number of employees in the district office has dropped to 25, with only 3 civil servants assigned the task of promoting and developing the irrigation groups. Only five water masters remain for the entire district.[40] This massive resource shortage has forced the irrigation agency and the district government to accept that they need to depend more closely on farmers.

Yet a similar shortage happened in Bantul, but it did not result in a turn toward developing water user groups. What was different? One of the major differences was the district government's attention in Kulon Progo was more focused on farmers. District elections are competitive affairs, and Kulon Progo's largest economic base is farmers. Over 80 percent of the population in the district is engaged in farming in one way or another. Each district head hopeful and each district legislator realizes that it is in their interest to focus on farmers. During my research period, I was fortunate enough to observe an election for a new district head. Each of the three candidates during their campaigns had paid special focus to farmer issues. The candidate who won had even

39 Interview, Agriculture Official, Kulon Progo, Yogyakarta, May 31, 2011.
40 Interview, Retired Irrigation Official, Kulon Progo, Yogyakarta, August 4, 2011.

visited some of the GP3A offices, due to the fact that their leadership also served as vote canvassers. According to farmers, similar events had occurred during prior elections.

Third, the previous district head and district legislatures have close personal ties to some GP3A leadership. They were from the same village. The district head's wife was in the same *arisan,*or rotating credit society, group with a GP3A chief's wife. This close relationship allowed for two important things to happen. First, the district chief knew what a GP3A was. He was informed as to their function and their utility. Second, farmer leaders were able to place personal and social pressure on the district chief to make sure he paid attention to their plight. At one point early during his tenure, the district chief gathered street-level bureaucrats from the irrigation and agriculture agencies together and lectured them on listening to farmers and working closely with them. During this meeting he also told them of his close relationship farmer leaders. As the district government controls the salaries of these local bureaucrats, his words reportedly had a strong effect on their willingness to work with farmers.

One final source of pressure for local bureaucrats to focus on farmer organizations came from within the irrigation agency itself. Pak A, a long-term civil servant was fiercely dedicated to promoting farmer welfare. His efforts to gear the agency toward farmer service combined with pressure from politicians to develop a strong relationship between farmer groups and the irrigation agency. Institutions he developed, including regular meetings every 15 days with GP3A heads and irrigation officials and methods for collecting water user fees, serve to sustain the close relationship between the bureaucrats and civil society despite his retirement in 2008.

Thus the GP3A organizations were built for effectiveness in Kulon Progo. Unfortunately for some, the institutional structure in which they functioned changed. While some of the organizations' institutions for cooperation have survived, others have scrambled to find new ways to continue their institutional strength. Those which survived were in units that had cultivated a closer relationship with village governments and had diversified their sources of funding and support.

It does appear that at the district level, the government experienced a high degree of political vulnerability regarding irrigation. Politicians were forced due to competitive elections in a farmer-dominated area to pay attention to farmer issues. Also, personal relationships and history in the area fed into politician's vulnerability on irrigation issues. The labor shortage in the irrigation agency contributed as well. These findings provide support for my theory.

Sleman Cases

Sleman district is located directly of Yogyakarta city and extends to both the east and the west surrounding the urban area. Its 574 square kilometers stretch from the lowlands around the city to the top of Mount Merapi. The area immediately north of the city is largely urbanized, with little distinction between the city and the district management. It is also the home to Gajah Mada University and Yogyakarta State University along with 27 other institutions of higher education. Because of the heavy university presence, as well as urban sprawl, much of Sleman district has moved away from its reliance on agriculture. According to 2006 numbers from the district government, the commerce sector[41] is the largest employer. Agriculture comes in third, behind public

41 The category is actually labeled, “Perdagangan besar, eceran, rumah makan dan hotel” or “Large

service, with about 19 percent of the labor force.

As mentioned above, my initial efforts in Sleman district to identify variation in the 24 GP3A units were not fruitful.[42] What variation did exist was limited. GP3A groups there range from existing only on paper to semi-effective, akin to the activities observed in BW, if not slightly less successful. Instead, as I was conducting early evaluations in consultation with the provincial agriculture and irrigation agencies, I observed that every winner of the provincial P3A contest since the mid-2000s came from Sleman. Most of these groups then went on to place well in the national contest. Yet I also knew from field visits that many of the P3A in the area were completely non-functioning. Thus I shifted my focus in Sleman to the P3A level to explain this phenomenon.

As mentioned above, this shift in unit size led me to chose three cases to study. Two were high on the slopes of Mount Merapi. One successful; one existing only on paper. They shared similar topography, climate, and cropping patterns. But these three variables were vastly different from the other cases I was studying. In order expand the explanatory power of my analysis, I sought out one more successful case at the southern end of the district where these factors were more reflective of the other groups I was studying. Thus I employ both a most similar and most different design in Sleman to evaluate the district's effectiveness in encouraging water user associations.

Sleman Cases: Sido Mulyo

Bangun Kerto village sits high on the slopes of Mount Merapi north of

---

commerce, retail, restaurants, and hotels." The category contains 22 percent of the labor force. Public services entail 21 percent. Numbers calculated from data obtained from BAPPEDA office, Sleman District.

42 Most of these GP3A are fairly young in comparison to those found in other districts. Only five were in existence by 2002. Eight have been created in the past three years.

Yogyakarta city. Its location discourages rice planting due to soil type and quality. In place of rice, farmers in the area developed a system of cultivating Salak Pondoh, or sweet snake fruit, which has become quite lucrative. Since their switch to snake fruit as a cash crop in the 1980s , the farmers of the area have enjoyed economic success relative to their earlier efforts with rice and vegetable production. The crop requires much less water than rice production and most vegetables, placing less strain on water resources. Their location also affords them abundant access to water.

In 1996 and 1997, the irrigation officials in the area began to promote water user groups to manage the tertiary canals. The farmers which drew their water from the canal originating from the Sempu II Dam on the Krasak River were organized into the Sido Mulyo water user group in August of 1998. The over 600 farmers who draw water from the canal are automatically considered members of the water user group. Although the organization was a top-down government creation, farmer leaders say that the farmers of the area wanted the group as well in order to make water sharing more fair.

Initially, though, the organization was merely supplementary to the work of the irrigation agency, if it functioned at all. Farmers claim that the organization was ignored by the irrigation officials for eight years. Rather than having the organization take charge for operations and maintenance, irrigation agency officials generally took care of the canal and water distribution. What activities did happen in the water user organization were initiated and funded largely by the irrigation agency.

In the mid-2000s, though, the irrigation agency's approach changed. The agency was charged with implementing the 2004 Water Law, which included working with water

user groups to operate and maintain canals, especially at the tertiary level.[43] At the same time, the irrigation agency began to suffer from a shortage in manpower, much like the experience in Bantul and Kulon Progo. Officials were retiring, while government budget shortages precluded hiring new ones. By 2010 over half of the irrigation officials in the district were nearing retirement. Less than a third were under the age of 40. In Sido Mulyo's irrigation area, the work of five officials was being done by three.[44]

The district official in charge of water user group promotion realized that the effects of the agency's severe labor shortage would not be overcome without farmer help. He had previously worked with farmer group promotion in a neighboring province, and he felt like a similar approach would work in Sleman.

He developed a series of training programs to upgrade the effectiveness of the water user groups in the area. Not all groups, though, were included in the program due to resource shortages. Of the 446 P3A in Sleman, the agency only had the resources to train nine per year. The district government relied on local bureaucrats to choose the groups that would receive training. The *pengamat*, or local irrigation official for the village, proposed that the Sido Mulyo group be included in the training program.

Starting in 2006, district officials implemented the training program in Sido Mulyo. The program includes four components implemented over the space of one year, complemented by follow-up visits. The first component included teaching farmers about

43 The 2004 Water Law's effects on P3A were very different from on the GP3A. While the GP3A had previously been charged with managing secondary canals, they were now stripped of this power. The P3A, though, were still charged with responsibility over tertiary canals.

44 These three officials are in charge of 32 dams and 147 water gates covering over 1069 hectares (2,641 acres). There are also 600 dams which are assigned to villages to manage, although the officials often are involved in their management as well. Interview, Irrigation Official, Sleman, Yogyakarta, June 9, 2011.

their legal rights and responsibilities regarding access to water. Second, the irrigation agency turns to training about operation and management of current infrastructure, which includes developing water distribution schedules and giving the farmer leadership the keys necessary to open and close headgates (see Figure 4.3 for an illustration of a water headgate and key). Third, farmers are instructed on infrastructure building and maintenance wherein they learn about how to fix and construct tertiary canals. Finally the officials return for monitoring and evaluation over a series of later visits.

Figure 4.3: Water Headgate and Key

By the end of 2006, the Sido Mulyo group was functioning independently enough to be nominated for the 2007 district water user group contest. They placed second that year, but they learned from the experience. In 2008 they placed first in the district and then went on to the national competition where they were successful in garnering a

national prize for their group.[45]

Since that time the group has continued to manage itself well with minimal inputs from the irrigation agency. They have constructed a number of small local canals which crisscross Salak groves without major assistance from the irrigation agency. According to local leaders, about 70 percent of all irrigation costs (operation, maintenance, construction, renovation) in the area are covered through farmer-paid water user fees. Regular meetings occur ever 35 days, and the organization is able to efficiently deal with the rare water conflicts between farmers. Also, both researchers and farmers assure me that no water stealing occurs in the groups.[46]

While some water user organizations that received special training from government officials have quit functioning shortly after the government concentration finished, such has not been the case in Sido Mulyo. Five years since their training, the water user group continues to function at a high level. Farmer leaders claim that their ability to build canals using water user fees has been vital to showing farmers how useful the organization is. As of 2010, 100 percent of farmers in the group paid their yearly water fees with almost 80 percent of the fees being used for infrastructure construction and maintenance. Farmer leaders argue that the key to maintaining the group has been encouraging recognition in individual farmers that the P3A provides them individual benefits. In other words, farmers know that they individually need the group, expressed in the phrase, "*kebutuhan saya* (my needs)."[47]

Beyond irrigation, the organization has also moved into the promotion of

45 Unfortunately the prize, a hand tractor, is useless in salak cultivation.
46 Interview, Researcher, Sleman, Yogyakarta, May 25, 2011. Interview Farmer Leader, Sleman, Yogyakarta, May 25, 2011.
47 Interview, Farmer Leader, Sleman, Yogyakarta, June 14, 2011.

economic activities. The group coordinated with local government officials to arrange for the export of Salak Fruit to China and Malaysia.

It seems that the irrigation agency's training program was a successful in developing an effective water user group. This training program emerged out of a resource shortage[48] combined with an innovative bureaucrat.

The success of Sido Mulyo could be argued to arise from a number of variables. Perhaps the cultivation of Salak or the prior introduction of Salak in the 1980s and 1990s provided for a stock of social capital that has helped the group. Or perhaps the village culture is more conducive to water user group formation. A few pieces of data may help to dispel these explanations. First, if the village culture or social capital were to blame, why did we not see the effects of it prior to 2006? Second, in the *pengamat,* or local irrigation district, there are over 20 P3A. They experience the same climate, village culture, and crop patterns. Of those, the three which have received irrigation agency training are considered effective. The remaining groups are not. The next case study was drawn from among those groups.

Sleman Cases: SR[49]

A short distance to the south of Bangun Kerto village and the Sido Mulyo group is a sub-village which houses the SR water user group. Farmers in this group, like their neighbors to the north, rely on Salak production rather than rice.

Compared to their neighbors, though, they were early-comers to water user group

48 Here it is important to note that this is a resource shortage rather than full-on political vulnerability. As of writing, I have little evidence that district politicians felt political vulnerability in irrigation issues. Instead, the vulnerability was felt by the district and local bureaucrats as they struggled to deal with resource shortage.

49 I have changed the name of this group to SR to preserve its anonymity and protect its members from embarrassment.

policies. Beginning in 1986, the community, under invitation from the government, established a water user group. They did so in order to gain greater access to government resources. According to the sub-district chief, the farmers only joined the group in order to fulfill government regulations for monetary distribution, i.e. if the village wanted money for an irrigation infrastructure project, they needed to have a water user group.[50]

Since that time, though, the P3A has not been in a continually-active state. Instead, the farmers rely on the sub-village government to manage water issues, including establishing water sharing between the water user group and others along the same canal. The only time that the water user group has been invoked has been when the local government wanted to access money for infrastructure development. At that time, they produced an application with the water user group's name attached.

According to local government leaders, none of the 86 members of the group can be considered active. None of them pay water user fees nor are meetings held for the group. The group also does not have *ulu-ulu,* locals who are in charge of managing and distributing water.

During interviews in the group, I found that farmers felt no pressure to join the group as water is abundantly available from both canals and natural springs. Taking water out of turn is common, and farmers don't abide by a regular water schedule for the group. They do share water with one other group downstream, which requires water three days a week. During the other four days farmers tend to take as much water as they would like. Some leave their headgates open with little regard for water management. Local leaders said that if there were problems with water management, they were taken care of during

50 Interview, Farmer Leader, Sleman District, Yogyakarta, June 24, 2011.

village meetings rather than referred to the water user group. As far as funding was concerned, the group relies completely on government funding to accomplish any irrigation tasks.

Upon further questioning, it was found that local leaders had little understanding of laws relating to water use and responsibility. They were also at a loss to explain the process by which they could apply for and receive more government funding if and when necessary. Their entire perception of irrigation management was completely reliant on government officials. Over the years they had become accustomed to relying on the irrigation agency, and they had little understanding of the role of a P3A in water management.

Despite the manpower shortages in the area, the irrigation agency had yet to pressure this group to become more active. This may be due to the abundance of water in the area and lack of pressure to become more efficient.

The organization serves as a strong counter example to the experience of Sido Mulyo. Despite sharing many of the same characteristics as its neighbor, the organization does not function. Without the irrigation agency attention and training, P3A organizations are likely to be ineffective.

Sleman Cases: Madu Warih

In order to show, though, that the activities of the irrigation agency are truly effective in promoting an effective water user group, I chose another successful group. This one, though, exhibits very different contextual variables than Sido Mulyo.

To the east and south of the other two locations, on the lowland plain in the

Prambanan area of Sleman is another water user group called Madu Warih. Unlike the previous two groups, farmers in Madu Warih rely on rice as their main crop. The low-lying land here is some of the southernmost in the Sleman district. As such, their water resources are much more strained because of both crop type and downstream position.

In 1993, villagers in the area established the water user group under a great deal of direction from the irrigation agency. According to local leadership, the farmers were motivated by water shortages and conflicts between farmers. They had hoped that the group would assist in increasing farmer income.

Until 2006 the group functioned reasonably well at organizing water distribution and farmer participation in cleaning canals, but it remained dependent on monetary assistance and guidance from the irrigation department. This was especially true in regards to infrastructure construction and canal renovation, but the dependence on government assistance also reached to efforts to organize farmers (*gotong royong*) to clean mud from canals or cut weeds from canal banks.

Beginning in about 2005, though, the group began to receive regular visits from the Irrigation Agency. Soon thereafter they received the same training as the Sido Mulyo organization. They then began participating in the district water user group contest, placing 4th in 2008, 2nd in 2009, and 1st in 2010. Each of these contests has been accompanied by additional training from the irrigation agency. Through the process, farmer leaders claim their group has become much more effective.

Farmer leaders now organize *gotong royong,* or community participation for canal cleaning and maintenance, without help from the irrigation agency. Water user fee

collections have increased every year since the training, reaching 70% in 2008, 80% in 2009, and 100% by 2010. The increase in water fee payment has allowed the group to become largely independent of funding from the irrigation agency in regards to operations and management. Leadership boasts of full activity among members, and they hold regular meetings.

One of the innovations that village leaders have used to ensure farmer participation in the group comes through controlling the agriculture agency's subsidized fertilizer distribution. The organization secretary is also the head of the local farmer group (*kelompok petani*). As such he was able to arrange with the agriculture agency to distribute the government-subsidized fertilizer. He requires, though, that farmers be an active member of the P3A before they can access the subsidized fertilizer. While this approach is somewhat authoritarian, it has served to create clear benefit for active members of the P3A.

Other benefits the organization has arranged for its members include contracts for seed corn production and an organic fertilizer home industry. The group is also active in writing grant proposals for funds from the village government. Finally, the water user group argues that its efforts have contributed to the increase in wet rice production in the area, which has increased from 9.46 ton/hectare in 2007 to 10.28 ton/hectare in 2010. This is partially due to the groups participation in promoting what is called System of Rice Intensification (SRI), a technology for increasing rice yield while decreasing water demand originally developed in Madagascar.

In 2011, the group also won the provincial water user group competition. It went

on the represent Yogyakarta Special Administrative Region at the national competition. At the time of my last visit, it was ranked fourth in the nation (field visits remained to determine the final placing).

Sleman Cases: Analysis

Of the three districts considered above, Sleman is a late comer to participatory irrigation management. It was the last of the districts in the province to participate in the WISM project, and most of its GP3A organizations are recent creations. The demographic distribution of the district also tends to encourage political leaders to focus on more urban issues and the promotion of tourism and the education sector for economic development.

Even so, the district is home to what appears to be an effective water user group training program. In each of the past 4 years, a P3A group which has gone through the irrigation agency's training program has won the provincial water user group contest and placed well in the national level. Of the 446 P3A in Sleman, only those which have been through the training program are considered independent of the irrigation agency.

What explains the emergence of this program? If my theory were correct, political vulnerability felt at the district level should be behind the irrigation agency's move to train water user groups.

Sleman politicians, though, do not experience a major degree of political vulnerability in irrigation issues. The district's upstream position guarantees it better access to water resources, and frequent annual complaints from its downstream neighbors have failed to pressure the district toward more efficient water management. In contrast,

recent years have seen the district becoming slightly less efficient with water as fish farming has become more common.

Also, the contribution of agriculture to Sleman's economy is ranked fourth behind other sectors. In 2006 it dropped below 14.5 percent, placing it behind manufacturing, hotels and restaurants, and services.[51] The district government's policies tend to focus more on the education sector and encouraging investment. The current *Bupati,* or district head, comes from an educational background and does not list agriculture as one of his priorities for his term (2010-2015).[52] Nor have civil servants mentioned pressure from the district government for agriculture development.

Thus political vulnerability does not seem to be the main driver behind local successes. Instead, it seems that the vulnerability which encouraged the irrigation agency to develop and implement the training program came from the labor shortage they face. Of the 192 civil servants in the district irrigation agency, 98 of them will be retiring with the next five years. Only 36 are under 40 years old. With current budget problems, the agency will be unable to replace the manpower lost through retirement.[53] This will leave the agency scrambling to continue providing services at a commensurate level; it will also place an increasing burden on those who remain.

---

51 BAPPEDA 2005.

52 "Profil Bupati dan Wakil Bupati Sleman Periode 2010-2015," Sleman District Government Website. Accessed September 15, 2011 from http://www.slemankab.go.id/806/profil-bupati-dan-wakil-bupati-sleman-periode-2010-2015.slm

53 Indonesia's civil service was under a hiring freeze from 2011-2013, although limits on hiring in the irrigation agency have been in place for years. Of the 491 districts, over 120 are struggling to pay their civil servant salaries due, in part, to an abundance of political appointments to the bureaucracy combined with declining revenue. This has led to a greater reliance on contract-based workers rather than civil servants. For more information on the hiring freeze, see Pasandaran, Camelia, Markus Junianto Sihaloho, and Ulma Haryanto. "Hiring of Indonesia's Civil Servants to be Kept in Check." *The Jakarta Globe.* August 25, 2011. See also The Jakarta Post. "Indonesia Lifts Moratorium on Hiring Civil Servants." *The Jakarta Globe*. January 21, 2013.

The irrigation agency has only a few options in order to continue in their mission. Bureaucrats must work longer hours or they need to rely more heavily on farmer contributions. Pak A who had worked on farmer empowerment projects in a neighboring province before moving to Yogyakarta, decided that the best option was to make sure that P3A groups could operate and manage their own tertiary canal systems. He envisioned the outcome of the training as independent P3A who took responsibility for their irrigation infrastructure and distribution. They would only rely on the irrigation agency in the case of major canal damage.

Unfortunately Presidential Instruction 38 of 2008 was recently implemented, which moved responsibility over the P3A organizations to the agriculture agency in the Ministry of Agriculture. Responsibility for canals and GP3A remains with the irrigation agency. Due to this shift, the irrigation agency, a division of the Ministry of Public Works, is no longer promoting the P3A program. Instead, in 2011, Pak A's training program is being re-fitted to focus on GP3A. The district agriculture agency, now unwillingly assuming responsibility for the water user groups, has no specialization in irrigation. Despite their spoken commitment to continue Pak A's programs, they have yet to do so. Almost three years after the decree, the agriculture agency has barely begun the process of collecting information about the P3A from irrigation officials. With a relative abundance of manpower, the agriculture agency is unlikely to feel the pressure to work with P3A beyond what is mandated by the World Bank loans that fund 80 percent of their work with irrigation.[54]

54 World Bank requires that the agriculture agency promotes the empowerment of five water user groups per year. This duty is assigned to the extension officers spread throughout the 86 villages. There are 46 permanent agriculture extension officers in Sleman, with another 40 working under yearly contracts.

Beyond the irrigation agency's attention to the P3A, there also appears to be some evidence that having the water user organization involved in crop promotion improves its performance. In Sido Mulyo, the P3A is intensively involved in *Salak* cultivation and marketing, including arranging overseas contracts for *Salak* export to China and Malaysia. In Madu Warih the P3A is involved in fertilizer distribution as well as promoting rice improvement technologies. These endeavors organized, at least in part, through the water user group increase its value in the eyes of farmers and improve their willingness to take part in the group. Thus providing an economic benefit appears linked to organization success, although these benefits do not seem to be a causal factor in organization formation. Instead they are important to sustainability of group cohesion.[55]

In conclusion it seems that resource shortages in the bureaucracy combined with the prior experiences of Pak A were the impetus behind the innovations in water user group development found in Sleman. There is also some evidence that water user group involvement in endeavors to achieve economic growth also encourages group cohesion.

Analysis of DIY Cases

The seven cases presented here provide some slightly unexpected results in reference to the hypothesis that political vulnerability may lead to the creation and development of effective institutions for irrigation management. Although there is some support for my theory at the district level, there is also evidence that the individual effect of a farmer leader or a bureaucrat can have strong influence.

At the most local level, i.e. the GP3A or P3A, it appears that political vulnerability was not the main driver behind institutional success. Here it appears that

55 Similarly, the Satuhu GP3A in Bantul district also is involved in economic promotion.

individual characteristics of water user group leaders have an amplified effect. The example of Satuhu shows that despite poor support from agency officials, the farmer leadership was able to encourage links between village leaders and the group. Pak L was also able to encourage development of formal and informal institutions for his water user group to function well. In contrast, the leaders of the BW group did not focus on institutions which could increase the effectiveness of their group. When I compared these findings with the Kulon Progo and Sleman cases, it also seemed that individual farmer leaders had a strong effect, but their effect was also shaped by the informal and formal institutional milieu surrounding the group. For instance, in Pengasih Barat, the farmer leader from 2004-2008 was very effective and energetic in his service in the group. He had lived overseas working for a few years before returning home to become a farmer, and his experiences gave him a greater capacity for organizational management. Yet, when he stepped down as head of the group, the organization continued to function without his primary leadership. The institutional rules of the organization seem developed enough to not rely on his personal touch. This contrasts to the Van Der Wijck Farmer Forum, which was promoted in 2009 by local government and Gajah Mada University as a successful farmer-based water management organization. Yet when the head of that organization contracted lung cancer and passed away, the group fell apart. By 2011 it existed only on paper. Thus the role of an energetic farmer leader does not necessarily develop an institution.

Still, though, I cannot discount the effect of an enterprising individual in developing an organization for water resource management. Such also seems the case in

Sleman, where I do not see evidence of political vulnerability on politicians, but I do find resource shortages in the irrigation agency. This is similar to Bantul. Yet in contrast to Bantul, these resource shortages led an enterprising bureaucrat to develop a program of P3A empowerment. The program has resulted in a graduate of the program winning the provincial water user group contest each of the past four years. These groups have become generally effective in managing water resources and promoting the economic interests of their members. This program emerged from an individual bureaucrat's response to resource shortages.

As for political vulnerability, scaling my research up to my unit of analysis at the district level, it appears that political vulnerability truly had an effect in Kulon Progo. Among the three districts considered above, politicians in Kulon Progo alone can be considered to have experienced political vulnerability. They then pressured and supported irrigation agency officials in working closely with farmers to develop institutions for economic development. This resulted in a disproportionate number of the GP3A in the area becoming effective, especially during the years 2001 through 2006, before the central government withdrew authority for water management from the groups. According to interviews and data I have gathered, all the GP3A in Kulon Progo would be considered relatively successful along the criteria in Table 4.1.[56] This contrasts to both Bantul and Sleman where neither experienced political vulnerability. Neither experiences much success either in GP3A institutions. Of the 35 in Bantul only a few can be considered effective, and of the 24 in Sleman none function at the level experienced in

56 This does not necessarily imply that they were successful at guaranteeing more water for members of the group. Nor does it imply that distribution was egalitarian. The groups experienced internal politics and certain sub-sets of members were more privileged than others. Still, though, using the criteria set out above, the groups were successful especially in comparison with other water user groups.

Kulon Progo.

It appears that the vulnerability of political leaders in Kulon Progo on irrigation issues, experienced through competitive elections where promoting agriculture is a major issue, informal pressure from social networks, and labor shortages in the irrigation agency, has resulted in institutional development. In contrast, the lack of pressure felt in irrigation issues has led Bantul's irrigation agency to place low priority on creating institutions for effective water user groups. In Sleman that lack of pressure was only overcome by the presence of one innovative bureaucrat, but its effect was extremely limited.[57]

This evidence for the role of political vulnerability has broader implications, provided that it is generalizable. These findings also have implications for our theoretical and practical understanding of what conditions encourage the developmental institutions to emerge on the ground.

First, resource shortages are important, but they are not enough. Neither are central government mandates for participatory management. Bureaucrats in all three locations experienced resource shortages. They were also legally charged with developing participatory institutions, especially in the years from 1999-2006. Despite this pressure, only bureaucrats in one of the three districts studied engaged in institutional development. In the remaining two districts local officials carried out programs from the central government, but these programs failed to result in a close interactive relationship between farmer leaders and bureaucrats. They also failed inculcate a commitment in farmer's minds to the water user group. This led to frustration on both sides, as district

57 The program only reached nine P3A per year, out of 446. It did not reach any GP3A until after 2011.

civil servants complained that farmers were unwilling and unable to engage in participatory irrigation management. Farmers complained that they were not truly being included in a participatory process. One farmer leader comically criticized the government's repeated training programs, "The longer we are trained, the stupider we get (*makin lama makin bodoh*)."[58]

This demonstrates that local bureaucrat incentives, at least in Sleman and Bantul, were not geared toward synergistic relationships with farmers. They, instead, focused on implementing rather dirigiste programs from the central government. Thus mere resource shortages coupled with policy mandates do not innovation make.

Second, from these cases we learn that resource shortages, with proper direction from local politicians can have positive benefits. Bureaucrats in Kulon Progo engaged effectively with the farmer organizations prior to 2006. This was in large part due to a long relationship that the irrigation agency had working with farmers, but it was also developed in response to pressure the district-level politicians felt in agriculture issues. These local politicians knew that their agriculture-based constituencies were concerned about irrigation. The district head also knew, thanks to personal and political ties with water user group leaders, that he needed to pay attention to the water user groups. Because of this, the district head has placed extra pressure and encouragement on local civil servants to work with farmers. He, and the local legislature, have also provided extra monetary support for the GP3A organizations, as well as provided forums for farmer complaints.

Political vulnerability in agriculture translated into pressure on irrigation and

58 Interview, Farmer Leader, Bantul District, Yogyakarta, April 27, 2011.

agriculture agency officials. This, in turn, led to closer, synergistic relationships with farmers.

Third, we see that one well-meaning bureaucrat can promote effective programs. In Sleman, the irrigation agency's efforts to train P3A groups was effective in producing independent, well-functioning groups. Unfortunately the effect was limited to nine groups per year. Why did this complementary relationship between farmers and irrigation officials not spread throughout the entire agency, though? Also, why did it not spread into the agricultural department? I argue that the missing link was political vulnerability. District politicians did not place any extra pressure on any of the three agencies who share responsibilities for irrigation (Agriculture, Public Works – Irrigation, and BAPPEDA). Instead, the efforts of one innovative bureaucrat were somewhat limited. Now that Pak A has been promoted and the P3A organizations have been moved to the agriculture agency, local researchers have little hope that the training program will be continued or even that it will successfully transfer to the GP3A level. Without political vulnerability placing pressure on all the agencies involved, the program could only have limited success.

Finally, we see something unanticipated by my theory. Group involvement in economic endeavors, such as crop promotion, coordinated bargaining with an outside company, or fertilizer distribution, contributes to a group's ability to remain active. These selective benefits offered group members have little to do with irrigation management, but they do create clear incentives for farmers to remain linked to the group and abide by group rules.

In conclusion, evidence from DIY provides support for the argument that political vulnerability can change the incentives of state actors so that they will engage in costly institution-building. This evidence needs collaboration, though. In order to demonstrate the generalizable nature of my theory, I also conducted research in East Java. In the next chapter, I also develop a test of my theoretical expectations in Thailand.

An Alternate Look: East Java

Research visits in East Java included sitting in a number of bureaucratic meetings held at the provincial and district level as well as some field visits, primarily in the Lumajang and Jember districts. Data gathered during these visits indicated that the development of water user associations in East Java is not as advanced as that experienced in DIY. When the province was up for renewal of the World Bank's Water and Irrigation Systems Management program in 2010, it did not attain the requirements for eligibility due to poor implementation of loan requirements, including promotion of water user organizations. Thus the province has turned to other funding organizations, including the Japan International Cooperation Agency (JICA).

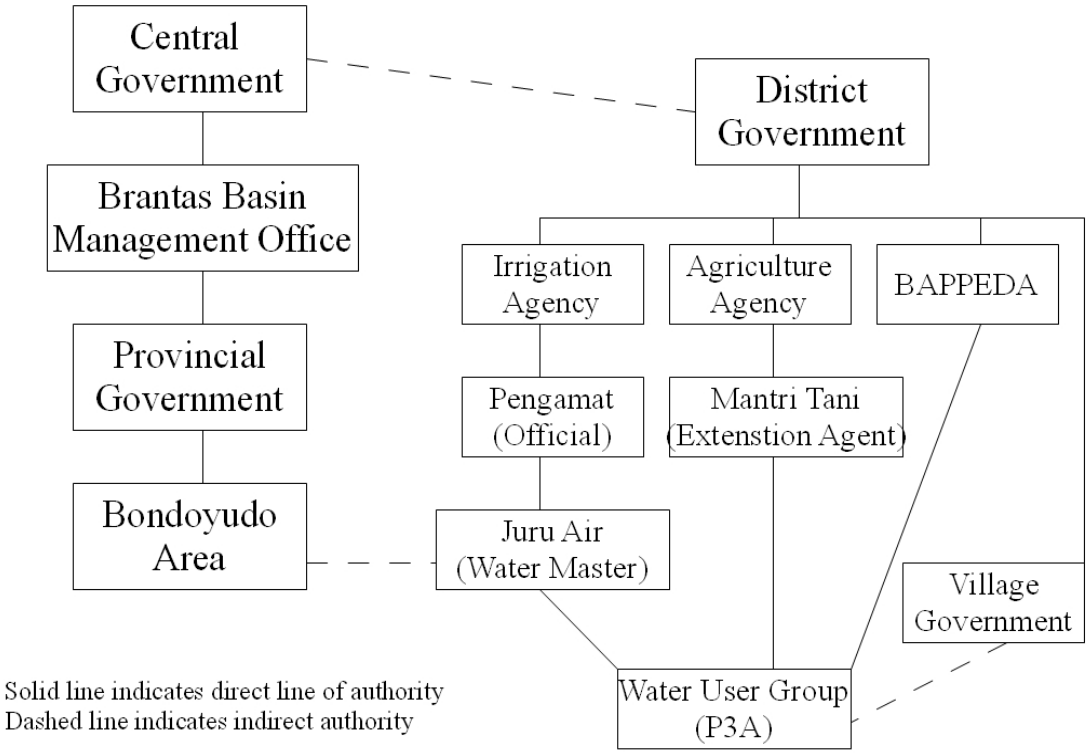
At the district level, irrigation officials have very few incentives to effectively implement policy. Most pressure for implementing participatory policies comes from the central and provincial governments, through the *Balai Besar Irigasi Wilayah Brantas* (BBIWB) which is a branch of the Department of Public Works at the provincial level in charge of irrigation management in the Brantas river basin. The officials charged with implementing these policies, though, are located at the district level. The BBWIS has no direct authority over them to punish those who refuse to accomplish tasks assigned them.

Nor does it have the authority to reward them if they do perform. Street-level bureaucrats receive pay from district coffers and their sights are generally set on the district head's policies. This governance structure is outlined in figure 4.4.[59]

Thus, as street-level bureaucrats are encouraged through meetings by central and provincial government leaders, they have little incentive to pay attention or implement these programs. During a meeting seeking to implement more effective data gathering measures by strengthening and working with water user associations with a number of *juru air* or water masters, the officials complained that going to the field was difficult and not worth it. One official stated that if he were to report actual numbers and data from the field his superiors would not be happy, which would just make his job more difficult. Instead he suggested that they just report the numbers that the agency desired. Another summarized the reluctance of irrigation officials to implement the program by saying, "If this program is implemented, I will have to do more work!" ("*Kalau ini jalan, tugasku naik!"*).

59 A similar governance structure exists throughout Indonesia thanks to the decentralization laws put in place in the late 1990s. Most resources and bureaucratic salaries are administered at the district level.

Figure 4.4: Governance of WUO in Lumajang & Jember Districts, East Java



The results of such an approach were observed in another meeting where the head of the BBWS complained that in a recent reporting meeting in Jakarta the data he presented was incompatible with data reported by the agriculture agency for the same area.

In the field farmers complained that they were ignored by government officials. When asked about his relationship with agricultural extension officers, one farmer responded, "I have heard of them but never seen one."[60] The water user associations generally exist only on paper or do not include farmers. In one area, the P3A was headed by a school teacher from a neighboring village who, according to farmers, had never

60 Personal Communication, Farmer, Bondoyudo Irrigation Area, East Java, March 26, 2011.

actually come to the canal. Other problems found in the P3A I visited included collusive relationships between irrigation officials and farmer leaders, conflicts between upstream and downstream farmers, water thievery, and rapidly deteriorating infrastructure. While these problems are fairly old, dealing with them through water user associations is fairly new, as in 2004 both districts had only a few water user associations. Data from the Department of Public Works indicates that Lumajang had only four P3A and Jember fared slightly better with 68 in existence, although none were considered "developed."[61]

In both districts, there has been little incentive to work with and promote water user associations. District governments have failed to pressure local bureaucrats to get involved or promote irrigation groups. Most pressure comes from the province or central government, which fails to encourage bureaucracy involvement with farmers, as the local officials do not see these mandates as part of their job.

Unfortunately I was unable to conduct enough research at the district level to establish what efforts, if any, district officials have been involved in to promote water user organizations.

Thus East Java provides some supplementary information that the problem of political vulnerability, at least in the current Indonesian administrative structure, must be felt at the district level. Officials at the provincial level and those paid by the central government experienced some pressure to increase the effectiveness of water user associations. Threats of losing resources from the World Bank and other international agencies focus on this level, and through meetings and interviews with these officials, I observed that the pressure had an effect on them. They were heavily engaged in trying to

61 Compared with Bantul and Kulon Progo which had 301 and 221, respectively. See PU 2004.

find ways to promote water user organizations through cooperation with universities and researchers. These efforts, though, were unlikely to have any affect as long as the pressure was experienced at the wrong level.

Vulnerability or pressure placed on provincial or central level bureaucrats will have little effect on the degree of success experienced by water user associations. Pressure must be matched to the appropriate administrative level, which, in Indonesia, is the district. Due to the decentralization reforms started in 1999, most administration of irrigation is conducted through district governments, yet international donor projects are funneled through central and provincial governments. When officials at these levels approach street-level bureaucrats, they have little authority to encourage or demand that irrigation officials engage in greater participatory work unless district governments cooperate.

Thus the contribution of East Java to my current analysis is that a general feeling of vulnerability is not enough to implement PIM policy. It must be matched with the administrative level in charge of implementing the policy.

Conclusion

The Indonesian cases presented here provided an opportunity to test whether or not local political vulnerability, in the absence of a national policy framework for PIM, could encourage the development of effective water user organizations. Due to decentralization in 1999, the Indonesian irrigation agencies are firmly under the policy purview of the district-level government, which allowed me to conduct comparisons in the absence of bureaucratic fusion. The cases seemed to indicate that in Kulon Progo,

where political vulnerability in irrigation is felt strongest through the mechanism of district elections, this has translated into the development of collaborative efforts between the local irrigation agency and farmers resulting in successful WUO. Even the least successful group I could find among the GP3A was on on par or more effective than the best that I found in either Sleman or Bantul Districts. In contrast, we see that an alternative causal pathway to effective WUO was found in Sleman District, where politicians felt little vulnerability in irrigation. Instead, irrigation officials, responding to staffing shortages, had developed a fairly successful training program for basic water user groups. In Bantul district neither of these things had happened, and the evidence was found in that only one of the district's 35 GP3A organizations could be considered successful. That success was driven by the personal efforts of the organization's leader.

Table 4.3, found at the end of this chapter, provides an outline of each of the case studies discussed above. Note that in this table, I have decided to use three categories to evaluate the level of success of the WUO. While a basic binary categorization was helpful for initially identifying cases to study, it did not capture the variation observed. I will discuss this in greater detail in my concluding chapter.

Looking at the table can provide us with a clearer picture of the role of political vulnerability in creating effective institutions for farmer-irrigation agency collaboration. In both cases which experienced political vulnerability, due to the electoral pressures put on district politicians by farmers in Kulon Progo, we see either successful or moderately successful water user organizations. In both Pengasih Barat and Pekik Jamal, which were found in Kulon Progo district, the district chief felt politically vulnerable on agricultural

issues. He thus placed pressure on the district's irrigation officials to become more responsive to farmers. This pressure from the local political leader resulted in local irrigation officials who were, in and of themselves, more interested in farmer welfare than their counterparts in other districts. The incentives of the street-level bureaucrats became aligned with those of farmers. Thus it seems as though political vulnerability could have been a sufficient condition to promote successful WUO.

But they are not the only successful cases. In Satuhu as well as Sido Mulyo and Madu Warih, success came despite an absence of political vulnerability. This indicates that while political vulnerability may be a sufficient cause for the establishment of effective water user organizations, it is not a necessary cause. Farmer organizations and collaboration with irrigation officials can be driven by other sources, such as resource constraints in the irrigation office or the individual influence of a local farmer leader.

Beyond political vulnerability and bureaucratic fusion, I have also included a series of other variables drawn from the case studies discussed above. Some of these, such as irrigation staff shortages or water resource shortages don't provide a great deal of information. This is due to the fact that irrigation staff shortages were felt by all cases. The effect is indeterminate, as some officials argued that this led them to work with farmers while in other cases officials facing such shortages were no more interested in working with farmers than when staff was abundant. At best we could make the argument that it was a necessary condition, but without variation, we cannot adequately test that. On the other hand, water resource shortages were felt by at least one less successful case. At the same time, one of the successful cases had adequate water. Thus we cannot argue

that water shortages are either necessary or sufficient alone.

On the other hand, in all successful cases, we saw that there was an obvious benefit provided to farmers from the water user organization. We see in the case of Satuhu in Bantul District as well as the cases of Madu Warih and Sido Mulyo in Sleman District that group involvement in promoting an economic benefit contributes to the longer-term viability of the organization. In the Kulon Progo cases, farmers saw the benefit of the water user organization due to the need for coordination to manage scarce resources. Thus, after establishment, a group needs to provide some sort of club good in order to prove its value to its members. Water user organization involvement in economic promotion seems a viable option.

In all but one of the cases, training and support from irrigation officials was important to the success of the water user organization. In both Kulon Progo cases as well as the two successful Sleman cases, close interaction with irrigation officials was key to their success.[62] Thanks to training and continued interaction with supportive irrigation officials, the groups were much more effective than their neighbors. This was especially clear in Sido Mulyo and Madu Warih, which only became active after the Sleman district's year-long P3A training program.

Only Satuhu received less attention from irrigation officials, yet still achieved success. For Satuhu, which was in Bantul and did not experience any political vulnerability, an active farmer leader has been key. The group also provides excludable goods to its members in the form of fertilizer, mushroom farming, and seed cultivation.

62 Of course in Kulon Progo, this could have been due to the effect of political vulnerability pushing the district head to place pressure on bureaucrats to be more involved in WUO promotion.

These factors contribute to the group's success, despite a lack of state actor involvement. Thus it appears that an effective water user organization can operate largely independent of state action, although this seems rare, at least in my research area.[63]

Thus we see that political vulnerability may be a sufficient cause in PIM development in Indonesia, but it is not the only path to effective WUO at the local level. Alternatives, such as an effective farmer leader or an interested local official can also lead to PIM.

As I turn to the Thailand case, I will demonstrate that bureaucratic fusion provides an obstacle to WUO development. I will also revisit the role of street-level bureaucrats who promote PIM despite a lack of incentives built into the policy framework. In the final chapter I will return to these issues.

63 Ostrom (1992) has argued that water user organizations oft times actually operate better in the absence of state involvement. Such has been the case of the *subak* in Bali. See Lansing 2007.

Table 4.3: Indonesian Case Study Evaluations

	Local Bureaucratic Fusion	Local Political Vulnerability	Supportive Local Politician	Training from PU Officials	External Pressure for PIM	Obvious Benefit to Farmers	Water Resource Shortages	Independent Organized Farmers	Level of Success
Satuhu GP3A			X		X	X	X	X	High
BW GP3A							X		Low
Pengasih Barat GP3A		X	X	X	X	X	X		High
Pekik Jamal GP3A		X	X	X	X	X	X		Medium
Sido Mulyo P3A				X		X		X	High
SR P3A									Low
Madu Warih P3A				X		X	X		Medium

Chapter 5

Sub-national Variation in Thailand

Background of Local Water Governance in Thailand

Here I briefly revisit some of the history of participatory irrigation management policy covered in Chapter Three. Thailand's efforts at participatory irrigation management can be traced back to 1963 when officials in the Royal Irrigation Department established the first Water User Associations (*Sahakon Phu Chai Nam*) in the northeastern region. These groups, though, were not established nation-wide; they were even sporadic in the northeast region where they originated. Furthermore, they were fairly ineffective at the tasks allotted them. Although the organizations were by-and-large unsuccessful, those which had been established remained on the books as legal entities.

Later efforts by the RID to encourage PIM came with smaller farmer organizations, the Basic Water User Group (*Klum Phu Chai Nam Phunthan*). The RID began developing these groups in the 1980s. Still, though, they were basically paper organizations.[1] Farmer names were jotted down and the group was granted legal recognition, but as soon as the government officials quit paying special attention to them, they fell apart. This led Molle, Nittaya, and Savakon to conduct a "post-mortem" analysis of the organizations and the water user associations which proceeded them.[2]

When the Asian Financial Crisis hit Thailand, the government sought out foreign

1 For examples of similar failures in implementing participation in the education sector, see Missingham 1997.

2 Molle, Nittiya, and Savakon 2002.

aid to pay its bills. In order to abide by loan requirements and the participatory sections of the 1997 Constitution, the RID began a series of pilot projects called Joint Management Committees (JMC) meant to incorporate farmer participation in irrigation management. As discussed below, most of these attempts were unsuccessful, but those which were successes served to spur on policies in 2009 to establish JMC throughout the country. In 2001, the government of Thaksin Shinawatra canceled the remainder of the loan, reducing much of the pressure for PIM reforms.

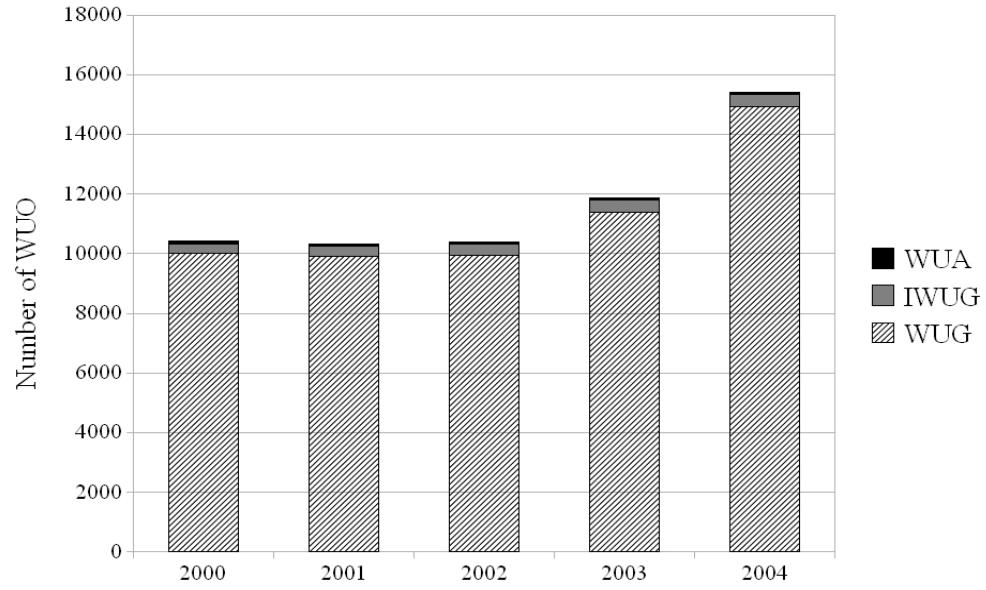
The RID, though, soon met with another pressure. The after-effects of the Asian Financial Crisis and the political administration of Prime Minister Thaksin Shinawatra took their toll on staffing numbers. Thaksin's civil service administrative reforms in 2002 established a new Ministry of Natural Resources with a Department of Water Resources. The Royal Irrigation Department was able to remain within the Ministry of Agriculture and Cooperatives, but its budget for staff was reduced.[3]

Shortly thereafter, and partially in response to pressure from international donors, the RID pushed for an increase in participation of farmers, measured by the number of water user groups established by each regional office. This also came partially in response to pressure from the Asia Development Bank for greater farmer participation in irrigation. A few officials within the agency also argued that an increase in water user groups would compensate for their shrinking staff numbers. This pressure evidenced itself in the RID's 2004 Strategic Plan, which called for increased farmer involvement in irrigation management. The emphasis, though, was on quantity rather than quality of

3 The total budget of the RID increased from 27,660 million baht in 2005 to 37,133 million baht in 2009. The proportion devoted to personnel expenses, though, dropped from 22 to 17 percent during the same period. A fair amount of this was committed to pensions, thus reducing the amount available for staff costs. Source: Royal Irrigation Department Annual Reports, various years.

water user groups. Over two years, the number of water user organizations in Thailand jumped from about 10,000 to almost 15,000. Figure 5.1 shows this development.

Figure 5.1: Number of WUO in Thailand, 2000-2004



Source: Royal Irrigation Department publications

Many of these new groups existed only on paper. By 2010 when the Office of Public Participation Promotion recounted the number of basic water user groups, the numbers had dropped to 12,462 and by 2011 the number had dropped to 12,003.[4] The pressure on staff numbers continued, as the number of officials and permanent staff dropped from over 50,000 employees in the 1990s to 32,425 in 2009.[5] While this decrease has placed a great deal of pressure on the street-level agency officials, actual promotion of farmer participation has rarely been a solution offered by the RID.

4 In contrast, the number of Integrated Water User Groups had increased dramatically from about 400 to 1,482.WUA had nearly disappeared entirely, with only 49 remaining in the country.

5 RID Annual Report 2009.

Within the central agency, though, officials within the Development and Management of Water Working Group as well as the Institute for Development of Irrigation[6] put forth plans to increase the degree of participation in irrigation management. These officials had personally observed the beneficial effects of participation in irrigation management, and they sought to increase awareness of the issue among top agency officials.[7] Their efforts did not see much success. The key actors within the RID continued to privilege construction over operations and maintenance.

In 2005, an official from the budgeting office was promoted to become head of the Development and Management of Water Working Group. While he had little experience in participatory management, he did have connections with the budget office. Through his efforts, the Office of Public Participation Promotion was established in 2008. He was also able to develop a number of training manuals for government officials as well as farmers regarding the how-to of PIM. As part of the deal needed for the office's establishment, it also encompassed a call center that handles complaints about all irrigation issues from around the country.[8] Despite the office being established within the RID, as of July, 2012, it had yet to receive official government recognition, a necessary step before the office is considered permanent.

The next major shift in the RID occurred in 2011 as Thailand was inundated with rain. The above-average rainfall combined with a number of other factors, including poorly-timed releases of water from the main reservoirs in the country, to cause massive

---

6 The Institute for Development of Irrigation is a unit within the RID's Irrigation College.

7 Interview, Former Head of Operations and Maintenance Group, Royal Irrigation Department, Bangkok, Thailand. March 30, 2012.

8 Interview, Head of the Office of Public Participation Promotion, Royal Irrigation Department, Bangkok, Thailand. March 13, 2012.

flooding in the central plains. The floods damaged rice crops as they moved south from Nakhorn Sawan province and finally entered Bangkok. Major industrial complexes, homes, schools, and government offices north of the city were abandoned for up to ten weeks as the flood waters slowly receded.[9] Poor coordination between government ministries, the prime minister's office, local government leaders, and citizens all played a role. At the end of the crisis, the head of the Royal Irrigation Department, Chalit Damrongsak, was removed from his position with little warning, prompting suspicion that his performance had disappointed the government.[10]

In consequence of the floods, the 2012 budget of the Office of Public Participation Promotion was cut, as the RID sought to focus funds on recovery. Rather than focus on increasing coordination or developing a water plan, the agency proposed construction of diversion canals, which engineers claimed could prevent future flooding of the capital. I arrived in Bangkok at the tail end of these events to begin my case selection.

Selection of Comparative Cases

Thailand's characterizations of water user organizations (WUO) include a number of different types of groups. These include Water User Associations (WUA), which were originally intended to be large encompassing groups for an entire irrigation system that would be involved in farmer finance, fertilizer distribution, and crop promotion. Later came basic Water User Groups (WUG), which are farmer organizations at the tertiary

9 As a personal aside, my research visa was delayed by the closure of the National Research Council offices.

10 His "punishment" was a promotion to become the Deputy Permanent Secretary for the Ministry of Agriculture and Cooperatives (MOAC). The Minister of the MOAC was a former head of the RID and a friend of Chalit.
See The Nation "Irrigation Chief Moved out in Sudden Job Swap." *The Nation.* February 23, 2012. Also see The Bangkok Post. "Embattled RID Chief Shifted to Deputy Post." *The Bangkok Post.* February 23, 2012.

canal level. Integrated Water User Groups (IWUG) are meant to combine two or more basic water user groups in the management of a secondary canal. These two sets of organizations most closely reflect those I studied in Indonesia under the titles P3A and GP3A. Along with these three types of organizations, Thailand also has a number of Water User Committees (WUC). These function approximately the same as water user groups except that they include a member from the irrigation department. Further up the management chain are Joint Management Committees (JMC) mentioned above, which include input from local business leaders, local government leaders, and irrigation officials.

As of 2011, the RID reports that there are 12,003 basic WUG, 1,695 IWUG, 35 WUA, and 170 JMC.[11] The vast majority of these organizations are not considered successful. Many are merely paper organizations, as the bureaucratic reporting requirements in the agency encourage local offices to pad their water user organization numbers.[12]

Despite the by-and-large poor performance of farmer groups in water management, a few organizations have seen success. In consultation with RID officials from the Office of Public Participation Promotion and local experts, I identified a small number of these successful groups, one per region. I then made a series of field visits to personally evaluate the groups and trace the historical process by which they evolved into successful water user organizations. My evaluations were slightly different than those conducted in Indonesia due to institutional differences. For instance, irrigation service

11 RID internal documents.
12 Anonymous Interview. June 19, 2012.

fees in Thailand are rare. While water fee collection is legal thanks to the 1962 Dykes and Ditches Act, very few locations collect these fees. Thus I could not gauge fee collection in the same way as in Indonesia. The specifics about my evaluations are found in Table 5.1.

Table 5.1 Thailand Water User Organization Evaluation Criteria

	Successful	Less Successful
Irrigation Agency Evaluation	Agency categorizes group as strong (*khem kheang*)	Agency categorizes group as underdeveloped (*on ae*)
Farmer Evaluation	Farmers feel the group is strong.	Farmers in the group feel it is ineffective.
Water User Group Funding	Farmers have found ways to fund their group outside of RID grants. This may include local government development funds or periodic donations by members.	Group relies almost completely on RID for funding.
Conflict Management	The group is able to diffuse conflicts among water users over water.	Conflicts are common and must be referred to the irrigation agency or local government.
Water Distribution	Carried out by farmer volunteers.	Managed by irrigation agents or local government.
Effective Leadership	Leaders knew the approximate number of farmers in their group, the amount of area their group had authority over, and basic facts regarding the formation of the group.	Leaders were unable to provide basic information about their group.

My visits included accessing organization records, conducting interviews with farmer leaders, local officials, and, in some cases, local political leaders. I paid special attention to identifying indicators of political vulnerability and bureaucratic fusion.

During field visits, I also requested that RID officials assist me in identifying a less-successful group which exhibited some of the same characteristics. This group was

then evaluated by the same methods as the successful group to provide a control case. These methods mirror those conducted in Indonesia with some minor changes made to adjust to the local situation.[13] The primary difference was the amount of time spent visiting each location. As distance from my host institution was a greater concern in Thailand, my field visits were of a more limited duration than experienced in Indonesia.[14]

My research led me to choose two contrasting IWUG organizations in Northeast Thailand and two contrasting IWUG in Southern Thailand. I also investigated three JMC groups, one successful group in the central plains, one successful group in the North, and one less successful group in the Northeast. Because of the paucity of JMC groups in the country, I could not find neighboring groups to compare them with. Instead I found two attempts to establish JMCs in the same region and sharing some of the same characteristics as those found in the successful groups. Because these two attempts resulted in paper organizations rather than effective groups, I relied on interviews with officials knowledgeable about the attempts as well as RID records about them. While the WUO were not perfectly compatible, they capture a broader degree of variation found in the implementation of participatory irrigation management. They also provide an opportunity to see how different approaches have allowed for success in a specific case.

Characteristics of these locations are laid out in Table 5.2 while their location is found in Figure 5.2. Because I did not visit the unsuccessful cases in Mae Lao and the

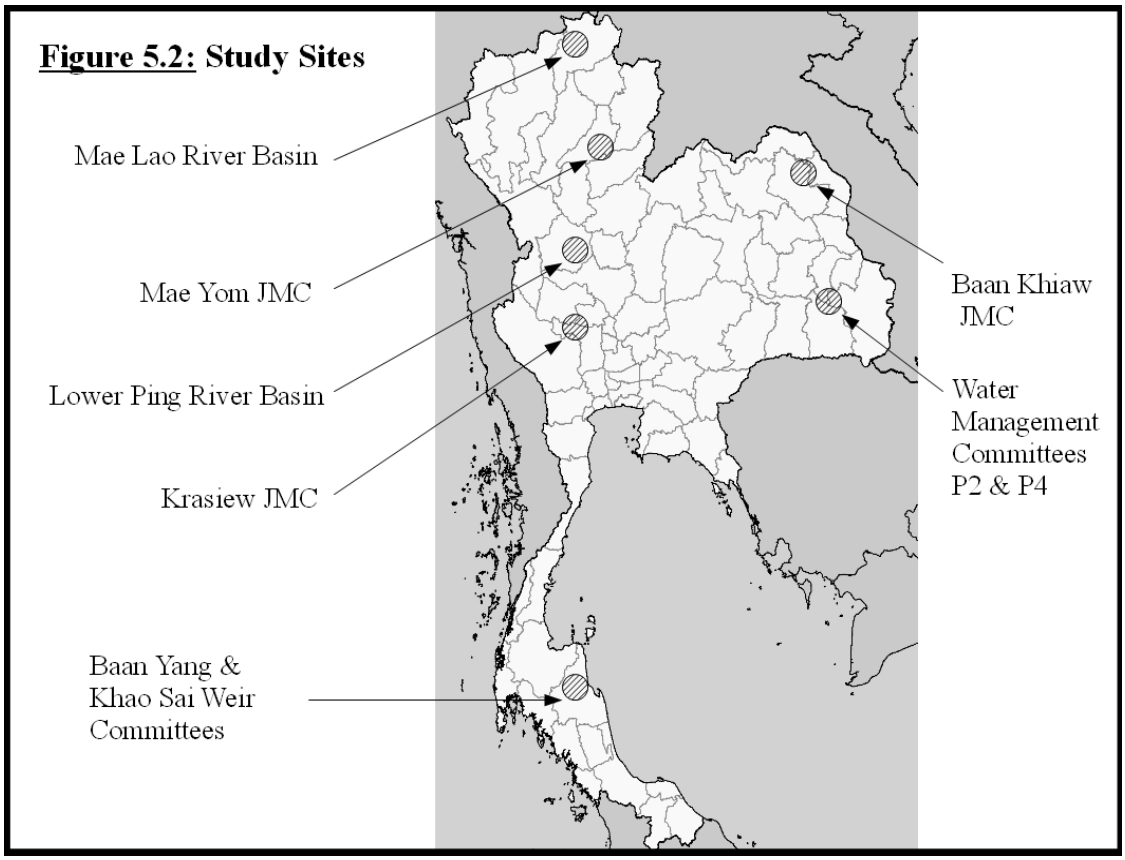
13 See my discussion of Indonesia in Chapter Four for greater details on case selection and variable measures.

14 In acknowledging this difference, it is important to note that research in Thailand benefited from some trail-and-error experiences in Indonesia. My own proficiency in identifying what information was important had increased over time. I am also much more fluent in Thai than in Indonesian, which allowed me to fit more interviews into a short period of time. Thus, despite the time differences, I believe the information garnered from the case visits was comparable.

Lower Ping River Basin, I have not included their data in the table.

Table 5.2 Case Study Characteristics

	Region	Water Source	Size	Crop Pattern	Water Availability	Farmer Occupation	Level of Success
Water Management Committee P4 (IWUG)	North-east	Pumping from River	827 farmers 5,423 acres 115 WUG	Rice (2 crops)	Scarce during 2nd season	Farming combined with outside work	High
Water Management Committee P2 (IWUG)	North-east	Pumping from River	851 farmers 12,545 acres 153 WUG	Rice (2 crops)	Scarce during 2nd season	Farming combined with outside work	Medium
Khao Sai Weir Committee	South	Mountain Reservoir	163 farmers 445 acres 5 WUG	Rubber, Fruit, Vegetables	Abundant	Farming	Medium
Baan Yang Weir Committee	South	Mountain Reservoir	174 farmers 405 acres	Rubber, Fruit, Vegetables	Abundant	Farming	Low
Krasiew JMC	Central	Reservoir	6,740 farmers 43,737 acres 9 IWUG 278 WUG	Rice (2-3 crops)	Abundant	Farming	High
Mae Yom JMC	North	River	88,538 acres 62 IWUG 528 WUG	Rice (1 crop) Vegetables	Scarce during 2nd season	Farming combined with outside work	High
Baan Khiaw JMC	North-east	Reservoir	500 farmers 36 WUG	Rice (1 crop) Vegetables	Scarce during 2nd season	Farming combined with outside work	Low



I used the same variable measures for political vulnerability as found in the Variable Measures section of Chapter Four. In contrast to the Indonesian cases, the level of bureaucratic fusion, or the degree to which the bureaucracy controlled policy at the local level, in the Thai cases was consistently high. street-level irrigation officials were by-and-large free of local government constraint. The RID budgets are independent of local government actions, and salaries are paid through Bangkok rather than through local governments. Civil servants in the RID often move due to promotions or periodic reshuffling, although when they find a location they enjoy they are able to choose to stay there at the cost of any future promotions.[15] Locally elected politicians at the sub-district

15 This arrangement often leaves bureaucrats disconnected from the villagers they serve and can contribute

(*tambol*) level often have a semi-adversarial relationship with the agency, as they are unable to fulfill campaign promises about infrastructure without RID assistance. The budget approval for such projects is slow, and the RID often seeks to have the sub-district foot the bill for construction itself by contracting with the Irrigation Agency. At the provincial level, where politicians might have more sway over the irrigation agency, governors are appointed by the prime minister. They face no electoral pressures.

Because of this high level of bureaucratic fusion, my theory would suggest that no successful water user organizations should exist. Nevertheless, a few do. My theory would be challenged if these organizations have emerged because of government promotion, as I would not predict that government officials would spend their time and resources on institution-building if they are able to avoid it under conditions of bureaucratic fusion.

Beyond this test, Thailand provides a wonderful opportunity to look at whether or not, and under what conditions, local political vulnerability can overcome the high obstacle of bureaucratic fusion. This analysis also provides the opportunity to identify variables that affect bureaucratic service provision beside politician control and monitoring.

The rest of this chapter discusses the findings from these cases in each region.

IWUG in Northeast Thailand

Northeast Thailand (also called Isaan) is demographically the most heavily populated part of the country, but it is also the poorest.[16] Poverty rates in the Northeast

---

to an adversarial relationship between locals and civil servants. See Missingham 1997.

16 World Bank 2001.

are about ten percent higher than in the rest of the country, and the region suffers from a lack of industry, investment, and government attention.[17] According to most recent numbers from the National Statistics office, total household monthly income in the Northeast is only two-thirds of the country average and approximately one-third of monthly income in Bangkok.[18] A vast majority of Isaan inhabitants are involved in agriculture.

Northeastern farmers face a number of challenges including poor soil quality, lack of access to water, and limited infrastructure. In the past they have also been disadvantaged by the state. Historically the region has been a source of cheap labor for the capital as farmers and their children leave their fields during the dry season to find work in the city. Despite the lack of development, the region receives relatively little government attention aside from historic responses to perceived threats.

The modernization of the Thai bureaucracy and nation-building spread into the region thanks to the fear of further French colonial interests in the early 1900s.[19] After the fall of the absolute monarchy and the political rise of the military, political leaders in the Northeast who resisted Bangkok's control were brutally executed.[20] Later, the growth of Communist sympathizers and the War in Vietnam led to more oppression and efforts to win the “hearts and minds” of the people through infrastructure projects, including irrigation.

In the late 1980s, the central government developed a “greening the Isaan” project in response to a severe drought. A number of projects were proposed, but few found their

17 Fan, Somchai, & Nuntaporn 2004.
18 National Statistics Office data from the 2007 Household Socio-Economic Survey.
19 Thongchai 1994; Ricks 2008.
20 Somchai 2002; Keyes 1995.

way off the ground as funding from the World Bank did not materialize as hoped.[21] Those projects which were completed had little effect on the people they claimed to serve.

Among these projects were a series of cement-lined canals connected to pumps on the banks of the Chi river in Ubon province built by the Ministry of Regional Development. Construction began in the late 1980s and was completed by 1991. At the time farmers were not consulted nor informed as to agency activities, and those constructing the canals were not concerned about what happened to them once they were built. One farmer, commenting on the construction of a canal near his farm said, "I thought someone was going to build a zoo up there; there were no fields nearby and the canal was in the forest."[22]

After the construction project ended, the canals and their pumps were abandoned. The Royal Irrigation Department was not authorized to manage them, and the local governments lacked the resources and technical capacity to run the pumps. Little, if any, coordination had taken place between disparate government ministries. The canals sat empty and unused for thirteen years. In recent years, though, some of the canals have been reclaimed and are managed jointly by farmer organizations and the RID.

I chose my case studies in the northeast from these canal networks within the Khuang Nai *Amphur* (District) in the Ubol Ratchatani Province. Initially I chose the area because one of the groups, Water Management Committee for Pump 4 (P4), received the 2011 national award for the best WUO in the country. According to officials, the group is well-organized and able to maintain and operate their canal system largely independent of

21 Molle et al. 2009
22 Interview, Farmer Leader, Ubon Province, April 5, 2012.

the irrigation agency. Upon visiting the organization, I established that the official's claims were generally justified.

I then asked for recommendations of farmer organizations in the immediate area which also rely on pumping systems that are less successful. The irrigation officials introduced me to the Water Management Committee for Pump 2 (P2). This organization was established later and does not function at the same level as P4. Even so, it is on the path to improvement. Thus is was not a perfect negative case for my analysis. I chose to continue the case study, though, because of the involvement of the sub-district (*Tambol*) government in sustaining its performance. This provides an alternative causal story to that experienced in P4.

Water Management Committee P4

Just off the bank of the Chi River, a short distance upstream from the That Noi Weir, sits a pumping station that provides water to 13,400 rai (5,423 acres).[23] The canal system, consisting of one main canal and eleven secondary canals, reaches 827 farmers. All of the farmers are members of the Water Management Committee for Pumping Station 4, referred to as P4 for short. This group was recognized as the best water user group in Thailand in 2011, and they receives special recognition from the Crown Prince in May, 2012. Much of the group's success comes from its independence and ability to coordinate with local irrigation officials for water management.[24]

Farmers in the area plant rice twice during the year. Once during the rainy season and once again at the end of the rainy season as the dry seasons begins. During the rainy

23 Land area in Thailand is measured in rai. 2.471 rai is equal to one acre.

24 Information for this section comes from interviews conducted in Ubon Ratchathani Province, April 5, 2012.

season in 2004, flooding was worse than normal in the lowlands around the River Chi. While farmers benefit from the annual floods most years, that year the flood waters were too high for young rice plants to grow and did not receded quickly enough for rice production. The farmers realized that without a dry season crop, they would suffer substantial financial losses. One of the village headmen, who was also a farmer, gathered the affected farmers and local village leaders together to discuss the situation. Farmers from four sub-districts met. At that time, the idea was proposed that the abandoned canals from the Greening Isaan project 13 years ago could be put into use for the farmers to access water during the dry season and preserve their income.

The farmers then proposed the idea to the local irrigation officials. The RID at the time did not yet have the authority over the pumps and canals, but the officials told the farmers that if they could form a farmer group and provide the money necessary to for the pump's power bill, they would be able to use it. The Ministry of Regional Development had turned the canals over to the sub-district government, but the sub-district had no resources to manage such equipment.

741 farmers gathered to establish the group. As their president, they elected the village headman who had proposed using the abandoned canals, and they legally established the organization as an integrated water user group on December 13, 2004. Afterward 115 basic groups (WUG) were formed for management of the tertiary canals.

During its formation, the group established a number of rules regarding water use and access. These included the requirement that farmers partake in canal cleaning and maintenance activities every growing season. Farmers that were unable to attend were

forced to pay a fine of 200 baht (approx $6.70) per day missed to cover the cost of hired labor. The group also established water schedules and a water user fee to pay for the electricity bill caused by the reliance on the water pump. They also established an agreement with the local irrigation department office over management of the pumps. The RID would manage and maintain the pumps, a task beyond that which the farmers were capable, as long as the farmers could raise funds necessary to pay the electricity bills and could operate and maintain the canal network themselves.

The initial seasons of water pumping were the most difficult. Relying on the pumps, which ran only during irrigation department office hours (8:30 am – 4:00 pm Monday through Friday), meant that the water supply was certain, but the amount of water and its distribution took some trial and error. The farmers chided their water user group leaders for not providing enough water or not delivering it as promised. These complaints often became heated to the point that farmers threatened to patrol the canals while carrying firearms. A female committee member related, "I was afraid to walk the canals alone sometimes. I was the only woman on the committee, and it was scary."[25] Water stealing also became common.

Despite these setbacks, the committee kept at its work. Through trial and error they found the correct distribution of water according to pumping capacity and canal length. Water schedules were clearly announced and posted at each of the diversion canals from the main canal. Committee responsiveness increased as they decided to meet weekly to discuss ongoing issues and consult with the irrigation department.

Farmers soon saw the benefit of the organization. They were able to plant a dry

25 Interview, Farmer Leader, Ubon Province, April 5, 2012.

season rice crop. Within a few short years the rules of water distribution became well accepted among members and the organization was no longer contentious.

Farmers are now very willing to pay the 120 baht/rai per planting season. Most farmers have even said that they would be willing to pay more, as long as their access to water is guaranteed. The committee does not even need to collect the money from farmers' homes either, as farmers deliver their water fee to the committee member assigned to their canal. Each member of the 11-person committee is responsible for a section of the canal, including fee collection.

Farmer volunteers, generally committee members, open and shut headgates. They also manage conflicts between farmers. Very rarely does conflict escalate to the point that irrigation department officials are required to step in.

The committee also is able to handle most small issues of canal maintenance and rehabilitation without waiting for either money from local government or from the irrigation department. Water fees are sufficient for minor repairs. One committee member emphatically argued that having the committee be in charge of this was much better than relying on the government. He said, "if we wait [for government action], we die."[26] Other committee members echoed this sentiment, arguing that they were able to accomplish tasks better and faster than the government.

This places the group well within the successful category. If my theory is correct, we should see some degree of political vulnerability among local government officials in the area with little bureaucratic fusion.

Politically, though, there is little support provided for the P4 water group. The

26 Interview, Farmer Leader, Ubol Province, April 5, 2012.

farmers who established the organization are members of village leadership but far below the level of government involvement I would expect in my theory. Sub-district and district leaders have little to do with the organization. Although they are regularly invited to take part in the groups activities, they rarely attend. Local elections do not hinge on water availability. There is little pressure for promotion of a water user organization. I could identify no positive indicators of political vulnerability during my visit with the group.

As for bureaucratic fusion at the local level, as indicated above, Thailand has a high degree of it. At the local level, the RID officials have no accountability to local government leaders. Decentralization mandates written into the 1997 Constitution were slow to take hold, and the Royal Irrigation Department was able to escape most of their effects. Salaries are paid by the central agency, which also provides no real pressure for participatory irrigation in the Khuang Nai area. Instead agency officials are charged with watching over a "weir" which controls the Chi River.[27] Working with farmers is very low on their list of official priorities. Also, local governments which wish to engage in irrigation-related projects are limited in their capacities and often rely on assistance and approval from the RID prior to engaging in the activities.[28]

So what is it that has prompted this group's success? A few factors appear key. First, the existence of a core group of committed individuals with management skills. The 11 committee members are willing to sacrifice and work hard to ensure that water was

27 The Thad Noi weir on the Chi River is essentially a dam. The weir designation was used by the RID when constructing the dam because they had failed to conduct the proper environmental impact studies for the region before construction. This would have made building a dam illegal. In order to bypass this obstacle, the RID renamed the project a weir despite building a dam. Anonymous Interview, March 2012.

28 Sukit 2008.

available. The leadership was drawn from the ranks of village officials and retired civil servants who were also farmers. Thus they had a management skill-set and level of experience working with bureaucracies not universal among farmers.

Second, benefits of group membership are obvious to farmers, as are the punishments for defection. 85 percent of rainfall in the Northeast falls during a few months of the rainy season. The rest of the year is essentially dry. This makes it impossible to plant a second crop of rice without access to irrigation water. The organization is able to provide enough water for farmers to plant a dry season crop. Farmers also know that defection from the organization means a loss of access to water. The group provides a selective benefit.

Third, once the irrigation group proposed its plan to the RID, one local official took a special interest in the group. This official had originally been trained as an engineer in the irrigation agency's college, but after his assignment to the Khuang Nai area, he developed an interested issues in public administration and the issues involved in water user participation. He had a special interest in the area, as his hometown was only about seventy kilometers (43.5 miles) from his post. As he worked more closely with the group and other water user groups in the area, his interest in PIM increased to the point where he enrolled in a master's degree program in public administration where he planned on writing a thesis based on the development of water user groups.

Finally, water management laws in Thailand provide enough policy space for the local group to act independently. Thailand laws on water management are seriously

outdated[29] and have few specifics written into law.[30] Thus the bureaucracy receives a great deal of discretion on implementing policy and acting toward farmer groups. While this has some negative impacts for water users across the country, for groups like P4, the policy space is vital. It means that, as long as the local officials are supportive, the group can raise funds and allocate them according to their own needs. It also allows them to manage and maintain the canals with minimal interference from the RID.[31]

Water Management Committee P2

Within the same *amphur* (district) of Khuang Nai, but further up the Chi River, four more pumping stations and corresponding canal networks were constructed during the Greening the Isaan projects. After the success of the P4 group, the farmers in the neighboring region became interested in forming a similar group to manage the canals at Pumping Station 2 (P2).[32] This organization covers a larger land area than the P4 group with 12,545 acres (approx 31,000 rai), but membership numbers are similar at 851 members. The leadership, though, is more diffuse with 57 members who are responsible for 153 basic water user groups. The canal network also reaches into four separate sub-districts. Compared to the P4 organization, this group is relatively new.

After a drought struck the area in 2006, the farmers, using previously established farmer groups,[33] gathered together to decide on a plan to request aid from the

29 The most recent water laws in effect were written in 1932, 1942, and 1962. Efforts to develop, pass, and implement a new water law have failed. See Unger & Patcharee 2011.

30 Christensen & Siamwalla 1993; Christensen 1994.

31 Notice the strong contrast here with Indonesia's 2004 water law which limits farmer control over irrigation to the tertiary level and mandates a greater degree of Irrigation Agency involvement. This has had negative effects in the Kulon Progo district. See chapter 4.

32 Information for this section comes from interviews conducted in Ubon Ratchathani Province, April 6-7, 2012.

33 It is important to note that these were not Water User Groups.

government. During that gathering, they reflected on the experience of the nearby P4 group and decided to ask that the RID initiate pumping from the river in their area so that they could use the canals that had been abandoned for almost 15 years.

The group decided that, rather than go to local RID officials, they would appeal directly to their member of parliament. They believed that if their application went through the regular bureaucratic channels, the assistance would likely come too late.[34] The parliament member wrote a letter on their behalf and appealed directly to the Director General of the irrigation department. Within a short time, they received permission to use the pump and canals.

Thereafter the group organized itself according to legal requirements and established the basic water user groups at the diversion canals. Farmers in each of the smaller canals had to meet and choose a head to participate in the committee. The process was completed in 2008 and the water user organization took over management of the canals.

The sub-district government of *Tambol Yang Khi Nok* has been extremely supportive of the PIM process. The sub-district provided offices for the group along with monetary support to assist in its development. Local leaders from the sub-district, especially the sub-district chief, actively attend group meetings.

Unfortunately, though, the group fails on some of the success indicators. First, the group remains heavily dependent on the RID for monetary assistance, especially in regards to maintaining infrastructure. This is understandable due to the fact that that

34 RID officials in the area assured me that this belief was true.

canals were left abandoned for approximately 14 years with no maintenance performed on them. Also, the group, as with P4, relies on the RID to manage their water pumps. Unlike P4, though, their agreement does not require that the group repay the RID for manpower above and beyond normal working hours. This is important as the P2 group runs the pumps on a 24-hour cycle. The overtime accrued by RID employees is paid out of the RID budget. This difference can be best explained by the fact that the initiation of the relationship between the farmers and the RID was mediated by a member of parliament. The RID was forced to take on this responsibility rather than coming to the table with the farmers through negotiation as in P4.

Second, irrigation department officials judge the group to be less successful. Part of this comes from the fact that the group is newer, and they have not yet learned through trail and error as the P4 group did. For instance, the punishment for a farmer to not attend the canal cleaning day is insufficient to encourage farmers not to miss the day. Another contributing factor is that farmers from the group frequently ask for a larger budget from the RID and local governments rather than manage budget issues on their own. Farmers still lack a sense of ownership over the irrigation system.

What is encouraging for the group, though, is that its members do see a clear benefit from joining. They are able to depend on a stable supply of water for a relatively low cost.[35] One farmer stated, "If we have water, we can make money."[36] Prior to the existence of the group, farmers had to rely on rainfall alone or their own pumping efforts which were far from guaranteed.

35 The charge is 120 baht/rai/season. This is in contrast to individual pumping, which costs about 200 baht in fuel per day without a guarantee of sufficient coverage.

36 Interview, Farmer Leader, Ubon Province, April 6, 2012.

Second, the leadership of the group seems to be learning. Despite having less of a service-oriented mindset than their counterparts in P4, leaders of the P2 group have regular contact with each other, irrigation officials, and farmers in the area; their efforts at promoting the group are having an effect. Group members explained that they could see that everyone has been better off now that the water is being pumped and the canals are full.

RID officials are hopeful that the group will overcome these limitations and join P4 in the successful column within a few years.

In regards to its scoring on political vulnerability and bureaucratic fusion, the P2 group is only slightly different than the P4 group. Bureaucratic fusion is the same. In fact, the same government officials work with both groups. They are paid by the central irrigation office and are generally free from local government oversight. Thus the bureaucratic fusion variable remains high.

Political vulnerability, though, is different. In the case of P2, the local sub-district government of Yang Khi Nok is very involved. The sub-district head attends meetings and is regularly involved with group leadership. The sub-district also provided a grant of 3,000 baht (USD 90) per basic water user group in the area and assisted the groups construct field shelters along the canal. The group office is housed in a sub-district building directly behind the sub-district offices. Other sub-districts also overlap with the irrigated area, and their sub-district chiefs sit on an advisory council for the water user group.

The sub-district chief views the group as vital to his electoral success. In fact his

campaign platform included the phrase, "Water to the fields," a promise to increase irrigation.[37] In a discussion, he stated that the water user group was essential to his plans to expand the development of the sub-district through the use of local resources.[38] The point was also made that because the sub-district has limited access to financial resources, farmer participation in the group was essential to its success. Local irrigation department officials later noted that the sub-district chief was interested in the water user group because the farmers were important supporters for his electoral success.

Due to these circumstances, I evaluate political vulnerability to be high, at least in the Yang Khi Nok sub-district that has been the major supporter of the group.

Thus I evaluate the growing success of the P2 group to come from a few sources. First, the local irrigation officials who have worked with P4 are also interested in working with and promoting P2. Having had positive experiences in a neighboring group, they are more willing and interested in developing another group.

Second, the sub-district chief in Yang Khi Nok is very committed to assisting the group. While sub-district resource limits prevent him from controlling irrigation in the area, he is readily able to sacrifice time and effort to promote the organization. He has staked his electoral hopes on water provision to farmers, and a healthy water user group is essential to that. Beyond the borders of the sub-district, the area's member of parliament has also garnered electoral support through his support of the organization's access to both RID labor and pumps.

Third, the selective nature of water pumping has allowed farmers to see the

37 The campaign slogan was *Nam thung na, fai thung thi*, or "Water to the fields, electricity to the homes."
38 Personal communication, Sub-District Chief, Ubon Province, April 6, 2012.

benefit from joining the group. Without the group they are unable to access water necessary to plant a second crop of rice each year. This clear club good encourages the group's success.

Analysis of Ubon Cases

The comparison of these two cases provides us two major insights. First, my theory would predict that under conditions of bureaucratic fusion, state actors should not encourage the development of a successful group. In other words, we should not see government officials engaged in initiating, promoting, and training farmers to be active in a water user organization. This holds true in these two cases. The P4 Committee's success did not come because of RID promotion or encouragement of the group. It was established by village leaders and farmers in the area. They were able to negotiate with the RID to obtain an agreement about pump management, but that was the extent of the RID's promotion of the group.

Later, as the group became active and successful, the RID officials in the area did welcome its development. This, though, came at minimal expenditure of resources to the agency, as the farmers actually contracted pumping to the RID.

Thus this emergence of a successful group in the presence of bureaucratic fusion does not run contrary to my theoretical predictions. The P4 Committee emerged out of independent farmer organization rather than government promotion.

Pushing this issue a little further, it is important to note the role of policy space provided the farmers to establish their own groups and manage them with minimal

interference from the irrigation agency. This is in contrast to what we saw in Indonesia, where the 2004 Water Law provided strong limits to the independent actions of water user groups. In the Philippines and Taiwan, as well, the laws regarding irrigation created a much more standardized system of implementation. In Thailand, the briar patch of policies brought on by overlapping bureaucracies combined with a lack of legal reform in the last half-century has created something of a policy void regarding water user groups. Other water user groups, especially the *muang fai* in the northern provinces, have been able to benefit from this policy space and the amount of discretion given local officials.[39] The lack of regulations creates the opportunity for water user groups to organize and engage in management of their water resources independent of the state. Thus farmers are able to effectively operate and maintain their own systems, provided they have the capacity and drive to do so. Such mobilization is more in line with that described by Ostrom.[40] Unfortunately, though, it is extremely vulnerable to changes in state policy, environment, or water use patterns.[41]

Thus we see that even with a high degree of bureaucratic fusion, indigenous farmer organizations are able to thrive and affect their access to water. Some of the variation in Thailand can be explained by the amount of discretion granted local officials as well as the policy space in which farmers can work.

Second, we observe the effect of political vulnerability under the system of

39 Interview, NGO Researcher, Chiang Mai, March 15, 2012.
40 Ostrom 1990.
41 Many *muang fai* organizations in Northern Thailand have recently fallen into inactivity as the RID has built permanent irrigation structures and vacation resorts have begun to draw water away from agriculture. Interview, NGO Researcher, Chiang Mai, March 15, 2012. For a discussion of *muang fai* see the section on Mae Yom below. This is similar to the effect of permanent irrigation structures in collective farmer action in Kenya. See Little 1992, 166-168.

bureaucratic fusion. In the case of the P2 Committee, local political leaders and even a member of parliament felt some pressure to promote irrigation in their area. This promotion lent itself to providing infrastructure assistance to farmers, but it has not pushed the irrigation agency to engage in institution-building. The water user organization benefits from the RID infrastructure and pumping, but there has been little training or encouragement of the group. Institutions within the organization are still weak and monitoring and enforcement of group rules is problematic. State involvement has been primarily in the form of funding rather than the more difficult task of institution-building. The organization seems dependent on these subsidies in order to run the pumps as well as maintain infrastructure. Again, this type of reaction is consistent with my theoretical predictions.

IWUG in South Thailand

Southern Thailand, excluding the three Southernmost provinces, achieves a higher per capita income rate than Northeastern Thailand. The increased prosperity is in large part due to a climate much more favorable to year-round agriculture. The region receives almost 3,000 millimeters of rain per year, in contrast to the northeast's average of 1,300 and the national average of about 1,600.[42] The dry season is not as pronounced as in the northeast.

Despite a large amount of rainfall, irrigation is still necessary as rain comes primarily during a single season. Without irrigation farmers would be unable to farm year-round. Also during the rainy season, irrigation systems work as drainage to prevent

42 Numbers vary slightly from year to year. See World Resources Institute Database.

flooding and loss of crops.

The large amount of rainfall coupled with the region's mountainous landscape present a number of challenges for irrigation and drainage, though. Most irrigation systems are relatively short, nestled between the mountains and the sea, and there is a greater reliance on small water reservoirs or tanks than found in the central plains or Northeast. During dry months these small water reservoirs provide irrigation water for rubber plantations, fruit orchards, vegetables, and rice. During the rainy season, large amounts of rainfall contribute to land slides, erosion, and flooding. Irrigation systems perform the essential task of drainage during these months.

The Royal Irrigation Department, along with the monarchy's Royal Projects initiative have developed a number of water tanks throughout Southern Thailand. While these projects were originally planned be operated and maintained by the farmers they serve, RID officials have found themselves largely responsible for water distribution and upkeep of these water tanks. Water user organizations, which were created at the time of construction, are mostly paper organizations. In the words of one RID employee, "they [the WUO] were inactive or useless."[43]

With assistance from RID officials, I visited Nakhorn SriThammarat Province where I chose a number of water user organizations, technically categorized as IWUG, to evaluate and measure their effectiveness. Nakhorn SriThammarat Province is the second largest in Southern Thailand. The provincial capital is both historically and religiously important. It is also the recipient of special interest from the royal family. Over 30 royal

43 Personal Communication, RID employees, Nakhorn SriThammarat Province, June 5, 2012.

projects for irrigation have been set up in the province.

I eventually settled on two groups which were chosen to take part in a series of training and empowerment exercises carried out by the RID and the Thailand Research Fund from 2009-2011. As part of the Celebration of the King's 84th year and in recognition of an increased emphasis on PIM, the RID developed a PIM improvement program in conjunction with the Thailand Research Fund and the Royal Projects Program, discussed in greater detail below. The goal was to train nine groups in nine provinces plus three others to make a total of 84 projects so that water users could make greater use of the tank systems already built.

The benefit of choosing groups from this program was that I could trace the causes behind success in certain areas and failures in others where they exact same policy was taking place. It was a pilot project, so long-term effects remain to be seen.

The two groups were chosen due to their similarities, yet divergent outcomes. Both were nestled in the mountains where farmers relied heavily on rubber plantations rather than rice fields. Their irrigation needs were based on vegetables, fruits, and other small cash crops which supplemented their incomes from rubber. Their water came from small water reservoirs located in the mountains above the groups. One group covered an area of 1,000 rai (about 405 acres), the other covered 1,100 rai (about 445 acres). Both involved multiple villages but neither crossed sub-district boundaries.

Prior to discussing the individual characteristics of each group, though, I will discuss the Royal Project initiative program that took place in 2009 through the end of 2011 to empower the farmer groups in the area. During the mid-2000s, the RID official in

charge of the Development and Management of Water Group in the central offices in Bangkok determined that the RID's approach to PIM was flawed. He stated, "the RID had been working with water user groups for tens and tens and tens of years, but they never met with any success."[44]

Through prior experiences observing the work of the Thailand Research Fund (TRF), he decided to approach the agency for assistance in developing a program for participatory irrigation training. The TRF had developed a series of programs called "Community Based Research" through which they provided small grants and training to community groups to with the purpose of empowering local people through training them how to identify problems and overcome them with the tools available. At about the same time, the Office of the Royal Development Projects Board had expressed interest in increasing the effectiveness of some of the existing projects.

When asked about this interest, officials referred to a statement made by the King that many of his development projects, including the over 2,000 water tanks and reservoirs, were being underutilized by the local communities. They felt that through a more participatory approach, farmers would be able to benefit from the infrastructure which had been built.

The three agencies, the RID, the TRF, and the Office of the Royal Development Projects Board, signed a memorandum of understanding to develop a new project to empower water user organizations to take a great role in management of these small-scale irrigation systems. Being unable to reach all 2,000-plus systems at once, the agencies

44 Interview with RID official, Engineering Office, March 30 2012, Bangkok.

decided, in commemoration of the King's 84th year, to begin with 84 projects. Again, commemorating the King's place as the ninth monarch in the Chakri dynasty, they chose nine projects in nine provinces, plus an additional three to reach 84. Provinces were chosen in each of these regions, the north, south, northeast, and the central plains.[45] The agencies established a budget of eleven million baht the first year (2009), ten million for the second (2010) and third (2011) years that would go directly to the 84 chosen projects, with a recurring budget of ten million baht for consecutive years after the program was completed to serve to expand the program to other projects.[46]

In each province, the RID agreed to hire temporary employees on a three-year contract to act as community organizers. The agency also committed to training employees about the importance of PIM. The TRF already had independent contractors in each of the provinces who would act as trainers or coaches to assist the community organizers develop links with the water user community. They would also train RID employees the skills they needed to implement community based research projects. The Office of the Royal Development Projects Board provided funding for the endeavor.[47]

In the field, the community organizers were supposed to visit communities and develop a working relationship with local leaders, such as village headmen. They were also tasked to re-establish connections with the leadership of the water user groups, which had been created years earlier during project construction. Using the TRF's community based research approach, they would coach locals and provide tools and

45 The nine provinces chosen were: Chiang Mai, Nan, Sakon Nakhorn, Mukdahan, Kalasin, Petchburi, Pracuabkirikhan, Nakhorn SriThammarat, and Narathiwat.
46 Interview with RID official, Office of Public Particpation Promotion, June 19, 2012.
47 Interviews with TRF officials, Bangkok, May 30, 2012.

assistance to help the water users identify one problem or goal for the community regarding irrigation. The water user group, with coaching, would then develop a plan of action and a budget for what they wished to accomplish. This proposal was submitted for review by the RID and the TRF, whereupon a budget would be granted for the project. Over the next year or so, the community organizers were meant to monitor and assist the group as it accomplished its goal.

The entire process was meant to be an empowerment and training exercise for water user groups. Through the project they were to develop leadership skills necessary for the organization to operate and maintain their own irrigation system. They were also meant to develop a closer relationship with the irrigation agency.

The community based research approach was fully endorsed by the TRF. The agency had years of experience with it, and had seen great successes in community empowerment reaching from tourism promotion and management to health initiatives, and including irrigation canal maintenance.

The project was initiated in Nakhorn SriThammarat province in 2009, and it continued until the end of 2011. Nine different royal projects were chosen, and two community organizers were hired. Results were mixed. One community organizer remarked, "Of the nine groups we worked with, only four or five are strong enough to continue now that the project has ended; the others will likely disappear again."[48]

The remainder of this section discusses two of these groups: one which

48 Interview, Community Organizer, RID Office, Nakhorn SriThammarat, June 5, 2012. The RID official who initiated the project argued that Nakhorn SriThammarat was the least successful of all nine provinces in the program. Interview, RID Official, Bangkok, March 30, 2012.

experienced success, one which did not. I then consider the implications of these cases, and the policy which prompted them, for my theory.

Khao Sai Weir Committee

The Khao Sai Weir is located in the Plian subdistrict of the Sichon district. It creates a reservoir from a small river that flows down a narrow gap between two mountains on its way to the Gulf of Thailand. The reservoir was announced in June, 1996, and the construction continued through 1997 and 1998, despite the Asian Financial Crisis. When completed, the weir was meant to provide water to a series of pipes which would take it to farmers fields through seven villages. The piping delivers water to approximately 1,100 rai (445 acres) and 150 households distributed through two main villages and assists in the water needs of five others.

The original water user organization was developed according to RID standards of the time, which meant that local village leaders' names were recorded as the leadership committee. No other activity was expected of them. Nor did the local farmers expect to be involved. In fact, their lives went on much as before. According to farmers I talked with, none of them actually accessed water from the pipes after the concrete weir was built. The farmers instead chose to access water for their needs from wells which they dug and maintained themselves, either as individuals or small communities.[49] One of the village elders did watch over the infrastructure that had been built, as he felt it was his duty to the king.[50] Even so, he and the other farmers of the area did not utilize the water made available by the weir. The farmers viewed the weir as property of the palace and the

49 Interview, Farmer, Nakhorn SriThammarat Province, June 5, 2012.
50 Interview, Farmer Leader, Nakhorn SriThammarat Province, June 5, 2012.

irrigation department. They had very little understanding that the weir was actually meant to provide water to them during the dry season.

The farmers also had a relatively poor relationship with the Royal Irrigation Department. At best the farmers could be described as indifferent to the agency's work, at worst they were hostile towards it. The RID did not spend much time building a relationship with the community. The head of the Operations and Maintenance office stated, “We are engineers. We don't know how to do public relations. There is zero training in public relations for engineers.”[51]

Then in 2009, the irrigation network was chosen as one of the nine areas in Nakhorn SriThammarat to receive the empowerment projects. When the community organizers entered the area, they went door to door meeting farmers. One said with a smile, “We felt like traveling salesmen.”[52] Through repeated visits to the area, they were able to build a relationship of trust with the local farmers. This was absolutely necessary for them to be able to organize the farmers into a functioning water user organization.

According to the community organizers, this first step of the process took the greatest amount of time. Farmers didn't like or trust the RID, and it took repeated visits to win them over into supporting this new project. The relationship-building portion of the project in the Khao Sai Weir area took approximately a year. Through this process, the relationship between the RID community organizers and the local farmers changed from adversarial to positive. By the end of the year, officials began to receive invitations to

51 Interview, Head of Operations and Maintenance Section, RID Office, Nakhorn SriThammarat Province, June 6, 2012.

52 Interview, Community Organizer, RID Office, Nakhorn SriThammarat Province, June 5, 2012.

attend weddings and monk ordinations. One community organizer described it as "from the back of the hand to the front of the hand," a saying roughly equivalent to a "180-degree turn."[53]

After the initial trust-building period, the RID began to focus on training the organization. A number of meetings funded by the project were held, as well as regular visits by officials to the area. Through this process, officials organized farmers into an integrated water user group with 163 total members on May 25, 2010. It has responsibility for almost eight kilometers of pipes, with responsibility divided among five basic water user groups.

The group has become one of the most active in Nakhorn SriThammarat province. Its leadership collects a yearly water fee of 100 baht (approximately $3.20) and is active in conducting water user group meetings and organizing communication between the RID and farmers in the area. Group leaders stated that farmers have the main responsibility in operating the system, although the leaders do have to monitor water distribution as farmers often leave their water access valves open rather than shut them once their allocation is completed.[54]

The local RID official responsible for promotion of participatory irrigation management declared that this group was the strongest water user organization in Nakhorn SriThammarat. When it was initially established in 2010, only about 30 farmers would attend meetings, but by 2012 many meetings had over 100 farmers in attendance.[55]

---

53 Interview, Community Organizer, RID Office, Nakhorn SriThammarat Province, June 5, 2012.
54 Interview, Farmer Leader, Nakhorn SriThammarat Province, June 5, 2012.
55 Communication, RID official, Nakhorn SriThammarat Province, June 5, 2012.

During my visit to the area, I was fortunate enough to observe a water user group meeting. Members of the group were concerned that funding was being allocated to benefit leaders of the group. They complained that the RID had contracted with people who were close to the water user group leadership for cleaning and maintenance activities rather than opening the opportunity up for the community. Due to this, the group decided to have a meeting to discuss what to do about it. The group leadership invited RID officials and a local district official to attend and act as arbiters.

The meeting was held in a community meeting area, and over 80 group members were in attendance despite a rainstorm.[56] Following introductory speeches from a district official and an RID official, group members were allowed to express their concerns. A number of farmers argued that they were concerned about the lack of transparency in money management in the group. As no one was willing to directly accuse the IWUG leader, a village elder, of misappropriation of funds, the comments were made in general terms. The RID official, in order to get at the heart of the matter, spent some time asking follow up questions to each complaint. Eventually, when the issue of RID contracts for maintenance around the pipes came to the surface, a consensus formed among the group.

At this point the RID official explained that the contracts were not made by the IWUG. In fact no water user fees had been applied to hiring locals for maintenance. That was the responsibility of the RID; water user fees, and thus the group leadership, were not involved in the issue.

56 While I can't exactly estimate the negative impact the rainstorm had on meeting attendance, I was surprised by the number of people who braved the wet to attend. Travel on a motorbike, as the farmers would have had to do, is made more difficult by rain. In my experience, a rainstorm discourages many people in Thailand, especially the elderly, as most farmers are, from going out. I imagine if the meeting were held on a day with nice weather turnout would have been much larger.

Once this point was clear, one farmer suggested that this confusion would not be a problem if the group had a clear budget. Another farmer then volunteered to made a public budget which he would post in the community hall. After a brief discussion, this proposal was accepted, and a plan for a public budget was made.

Once these issues were resolved, the RID official suggested that to close the meeting they should hold a vote whether or not to keep the IWUG leadership as currently constituted. If farmers were still dissatisfied with the money issue, they should be able to change the group leadership. The vote was held, and the group leadership remained the same.

This anecdote is interesting for a number of reasons. First, it indicated the level to which the IWUG has become important to the community. Had the group been a mere paper organization, turnout would not have been as high. Nor would a meeting have been called. It is important to note that the farmers themselves called the meeting; they were invested in the group.

Second, the role of the RID in the meeting was that of mediator rather than leader. The farmers had called the meeting, and they largely conducted it. The RID official was important as a neutral party to mediate between the leadership and its accusers, as well as to explain the actual source of funds for maintenance activities. This indicates that the group, despite being in existence for only two years, is quite successful at eliciting member participation.

Third, farmers were willing to volunteer time and effort to make sure that the group was successful. One farmer even volunteered to develop a public budget for the

group in order to ameliorate the concerns expressed in the meeting. This community commitment and participation is rare among water user organizations in Thailand.

Thus, I judge this water user group to be successful. One of the leaders of the group expressed it this way: "We see results from the group, and we are strong. We are able to share water and share labor."[57] Besides regular meetings, the group has also been involved in voluntary maintenance projects on an as-needed basis. In 2011 a landslide filled the small water reservoir with dirt and rocks. It blocked the pipe for water outtake. The IWUG gathered to dig out the pipe and return the system to operation.[58]

While searching for political vulnerability, I was unable to establish that local politicians felt particularly vulnerable in water resource management in the area. The region receives a large amount of rainfall, almost 3,000 cubic centimeters per year according to the RID. The area, though, does not rely on rice or other water-intensive crops. Instead farmers are dependent on rubber, which requires less water and did not depend on irrigation. Water access during the dry season was considered useful as it allowed the farmers to plant vegetables and fruit, but it was not an absolute necessity. The only evidence of political pressure for the region I found was the fact that the area was once considered a strong hold of the Communist Party of Thailand, but it seemed as though that was no longer a concern among local political leaders.[59]

Local irrigation officials did not feel a great deal of pressure to be involved in participatory projects. In fact, one complained to me that participatory work was often

57 Interview, Farmer leader, Nakhorn SriThammarat Province, June 5, 2012.
58 The RID had yet to bring in equipment to dredge the reservoir one year later.
59 RID, Nakhorn Sri Thammarat 2011.

"*sia wela*" or "a waste of time." He went on to explain that he received no benefit from working with farmers. He would receive no salary increase nor promotion potential from working with farmers.[60] Instead it was just something he did because he felt he should, but it definitely took time away from what he perceived as his actual job.[61] He argued that if the RID was actually committed to PIM, they would hire an official to be responsible for working with farmers directly and training them.

Bureaucratic fusion, as noted at the outset of the chapter, was high. Irrigation officials had no responsibility to the locally elected politicians. Their only chain of command was through the irrigation department, and their ties were closer to Bangkok than to the local government.

Instead it appeared that the water user group's success drew from other sources. The community organizers argued that part of the success came from the fact that the water system was limited in scope. The small size allowed for closer social ties between group members.[62] The effect of group size on collective action has been long recognized,[63] and this result would be in line with theoretical expectations.

The leadership of the group also seemed important. The president of the IWUG was a village elder who was highly respected. He had spent years watching over the water reservoir prior to its utilization, and he was well known. His participation gave the group a level of local legitimacy. The other group leadership was also active in the

60 Repeated interviews with RID official, Nakhorn SriThammarat Province, June 4-8, 2012.

61 This official was active in promoting PIM, as he felt personally it was important. His efforts, though, seemed half-hearted at best. When compared to the efforts of officials in Phrae or Krasiew described below, his promotion of participatory management was minimal. Efforts to promote farmer participation were secondary to his actual focus, construction and rehabilitation of projects throughout the province.

62 Interview, Community Organizer, Nakhorn SriThammarat Province, June 5, 2012.

63 See Olson 1965.

community. Their voluntary contributions were vital to the group's survival.

Third, farmers saw results. Prior to utilizing the piping system, farmers in the area had to rely on individual wells and pumps to provide water for their crops during the dry season. This cost them a fair amount in fuel for the pumps and the water supply was not sufficient. Once the pipe system was made available to farmers with a minor water fee, farmers were able to gain greater access to water and reduce their fuel costs. The observable results certainly encourage participation.

Finally, it seemed as though the lessons from the community-based research project had taken hold in the group. Through observing the meeting described above and through interviews, it seemed as though the farmer group had learned from the three-year project conducted by the RID, TRF, and Royal Projects. In this case, their efforts seemed to have been successful. Farmers had learned to independently consider a problem and seek out a solution through community action.

The positive review of the group must be made with a major caveat. The group has only been in existence for a few years, and only one year has elapsed since the community organizers ended their intensive training and visits to the organization. Thus my positive evaluation may be a bit premature.

Baan Yang Weir Committee[64]

The contrast between Khao Sai Weir IWUG and the Baan Yang Weir IWUG is the starkest that I observed in either Thailand or Indonesia. After visiting the Khao Sai Weir

64 I have changed the name of this WUO to preserve its anonymity and to protect its members from embarrassment.

Committee, I consulted again with the RID community organizers about which of the eight remaining groups in their project would be the best negative comparison. At this point they were very reluctant to discuss the failures experienced. It was only after repeatedly confirming with the RID official who supervised my visit to the area that showing me a failure was acceptable were they willing to discuss Baan Yang with me.

The Baan Yang system is similar in size and topography to the system in Khao Sai. The weir and corresponding reservoir is nestled in a small valley surrounded by rubber plantations. The almost 3.5 kilometer-long pipe system drawing water from the weir covers approximately 1,000 rai (approximately 405 acres). The integrated water user group charged with managing the system is composed of 174 members that are split into three basic groups within the administrative boundaries of a single village.

On paper, the organization is almost identical to the Khao Sai group, and it would seem that the group should experience a similar level of success, yet it does not. RID officials and the community organizers stated that the group was perhaps the least successful of the nine that they had worked with.

When I requested to be introduced to some members of the group, the community organizers balked. They stated that they were afraid to go and visit, as they felt the farmers there would be angry with the RID. Community organizers had spent a great deal of time trying to develop a relationship with the farmers, but after the project ended in 2011, they had not returned to the system. They expressed concern that the farmers in the area would be mad and feel as though they had just been used to accomplish an RID project. Their relationship with the farmers had ended very suddenly when the RID

project funding halted.

After a great deal of encouragement, the community organizers agreed to take me to the system. As we climbed in a truck to drive to the location, one community organizer said half joking, “You'll need to be ready to run if they want to fight with us.”

Fortunately, the worst fears of the community organizers were not fulfilled. Even so, the interview with the leader of the group was slightly tense.[65] Through questions it was obvious that the water user group wasn't active.[66] His estimate of the membership rolls was only about half of those registered on RID records, and he stated that the group wasn't very necessary as farmers in the area have a number of water options during the dry season. They also avoided meetings unless RID personnel initiated them, which had not occurred since the end of the project.

When asked about his contact with the RID, he said that officials only come to the area about once a year. He then explained, “The officials I know have all retired now. The new ones are different. They are all in the office in the city, and if I want to talk to them, I have to go find them.”

He also complained that the RID no longer allowed his group to be responsible for water management: “In the past, officials left the keys to the water gates at my house. We could open or shut the pipes as we needed. The new ones took the keys back. Now if we want to open the water gates we have to do it with our own tools.” Technically,

---

65 Perhaps the most striking sign of the poor relationship between the RID and farmers in the area was that the farmer leader and his wife did not offer a beverage or snack to the visitors during the interview. Even in the poorest Thai households, it is basic courtesy to offer a glass of water to a visitor as they sit down.

66 Interview IWUG leader, Nakhorn SriThammarat Province, June 6, 2012.

opening water gates without RID permission is illegal, but the RID employees accompanying me were not concerned with the leader's admission.

As the interview ended, one more piece of evidence came to the surface that the water group was inactive and had a poor relationship with the RID. The water group leader mentioned a broken pipe in the system that had been pouring water into the river for months, making the system inoperable. My RID guides then asked if he had reported it; he had not. The RID was completely unaware that one of their systems was damaged, and no farmers felt the responsibility to call officials and report it.

A number of reasons exist as to why this IWUG was inactive. First, they had a number of water options in the area. According to both RID officials and people in the area, the Baan Yang reservoir was not the only with a system of water pipes in the area. Since farmers could turn to a number of water pipe systems, they had little use for the group.

Second, the water from Baan Yang was heavily polluted. Families in the area, and even a school, once drew water from the system for household uses. Since rubber plantations have spread across the hills surrounding the reservoir, fertilizer and pesticide runoff has pooled in the water. One household explained it was too dirty to bathe in or even to wash clothes in. The pollution also limits the usability of the water for agricultural purposes as the mix of chemicals in the water can kill useful plants.

A third impediment to the success of the group is that farmers see no benefit from participation. The water user group leader explained that 30 years previously, farmers in the area competed for water as they were planting rice. Now they have switched to rubber

and other crops, they need less water. This means that participation in the group is unnecessary.

Finally, the farmers and the RID had a poor relationship. Community organizers argued that when the project started, the farmer was very hesitant to trust the RID. Building a relationship of trust with the community organizers took a long time, but once the project ended, the relationship was over. The farmers in the area then felt as though the RID had betrayed them and only used them to accomplish a project. Thus, the situation is "almost worse than when the program started."[67]

Analysis of Nakhorn Sri Thammarat Cases

In Nakhorn Sri Thammarat there was no indication of local political vulnerability in irrigation issues. Abundant rainfall as well as a reliance on rubber production combined to relieve any pressure local political leaders might have felt about irrigation management.

The "politics as normal" situation in the province lends itself to the RID managing irrigation with little influence from politicians. Beyond that, the conditions of bureaucratic fusion remove any incentives which street-level bureaucrats might have to pay attention to local politicians who might request institution-building in irrigation management. The local office approaches irrigation management as a technical problem, and invests as little effort as possible in working with water user organizations.

The 84th Jubilee Program in improving PIM was implemented as a top-down program handed to street-level officials from Bangkok. While its implementation in

67 Interview, Community Organizer, Nakhorn SriThammarat Province, June 6, 2012.

Nakhorn Sri Thammarat did have a positive outcome in Khao Sai, it did not involve any major changes in the way that irrigation officials handle PIM on the ground. Leaders from the Thailand Research Fund complain that their hopes for the RID to embrace participation and empowerment through the program have not been fulfilled. They felt that the RID did not place a priority on the PIM project, and that the training was wasted as most of the RID employees who received PIM training were temporary employees.[68] The vast majority of these temporary employees have now left the agency.[69] RID officials also complained that their work on developing participation among farmers bears them no benefit in the agency. Working with farmers requires that they sacrifice time and effort from projects that will actually benefit their career advancement.[70] Because the RID never truly invested itself in the program, the results did not include institutional shifts which would encourage PIM.

Due to this, it appears that the success experienced in Khao Sai was site-specific and may only be temporary. One of the community organizers who had worked with the groups expressed it this way, "if the project is not extended, then [the RID] will have to start all over again. The farmers will loose the trust and relationship we built with them... Pretty soon they won't know anyone at the RID again."[71] The institution-building conducted by the community organizers was not accompanied by any shifts in the local RID office which would have encouraged a continued emphasis on PIM. This lack of institutional change in the presence of strong bureaucratic fusion and a lack of political

68 Interview, TRF Officials, Bangkok, May 30, 2012.

69 The RID had promised to send officials to the training under the agreement they had with the TRF. Instead the training meetings were attended primarily by community organizers who were on three-year contracts with the RID.

70 Multiple Interviews, RID Officials, Nakhorn Sri Thammarat, June 4-8, 2012.

71 Interview, Community Organizer, Nakhorn Sri Thammarat, June 5, 2012.

vulnerability seems consistent with my theoretical predictions.

Beyond my theoretical analysis, the cases in Nakhorn Sri Thammarat also demonstrate that when farmers have little incentive or desire to be engaged in water management, the incentive cannot be easily manufactured by the irrigation agency. Would an active water user group conceivably have been able to provide some sort of communal benefit in Baan Yang? In the irrigation agency's view, a water user group could have managed water distribution and sought to reduce pollution in the area, but in farmers' minds activity in the group provided them with little tangible benefit. This disparity between the viewpoint of the RID and farmers was one of the most difficult obstacles for promotion of PIM in Thailand.

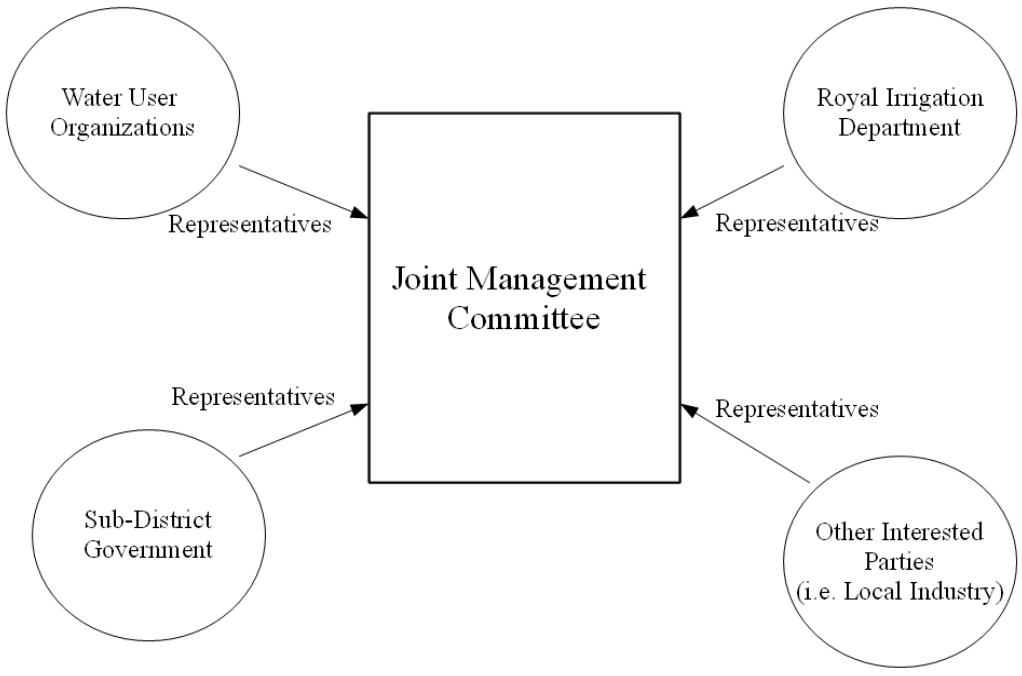
Joint Management Committees

As mentioned above, I made field visits to three different Joint Management Committees (JMC) and collected data regarding two others that were planned but never effectively implemented. Two of the JMC locations I visited can be considered successful. A third is less so. The remaining two groups discussed are not active.

Joint Management Committees were first brought to Thailand through the Asia Development Bank's Agricultural Sector Program Loan after the 1997 financial crisis. During that time, the Thai government was dependent on foreign loans, as explained in Chapter Three. The ADB loan included requirements for greater community and farmer participation in irrigation; it also included funding to promote that goal. The RID complied with these loan requirements by developing a series of pilot projects for the creation of five initial Joint Management Committees.

JMC are meant to be a forum through which all parties interested in water management are able to gather to jointly manage water resources for an entire irrigation system. They include four main parties: agricultural water users, RID officials, local government leaders, and other interested parties such as local industries that use water and agriculture extension officers. A graphic representation of a JMC organization is provided in Figure 5.3.

Figure 5.3: Joint Management Committee Schematic



Adapted from Royal Irrigation Department publications

The ideal JMC would meet at least once each planting season to determine water needs of the community, industry, and farmers. It would then develop a water plan, which would be returned to the water user organizations so that they could adjust their expectations for water supplies for the year. The leadership of the JMC would then be

able to adjust water plans as information is passed between farmers, local government, the irrigation agency, and industries so that water could shared fairly among all parties who require it.

The JMC idea, though, depends heavily on the prior capacity of water user organizations in the area.[72] Unless farmers are able to gather prior to the JMC meeting and develop a water plan so that they can present it at the JMC meeting, the organization would have no benefit. The bottom-up logic of the organization runs contrary to the top-down way in which the groups were implemented around the country. One official lamented this fact, "[the JMC] is now a policy of the RID, and they'll implement it anyways, whether or not the water user groups in the area are ready."[73]

Due to difficulties in implementing JMC around Thailand, by 2009 there were only nine registered groups around the country with about a dozen in the planning stage.[74] Officials in the Office of Public Participation Promotion argued that the farmers groups in existence were not prepared for the establishment of JMC throughout most of the country, and those JMC in existence were largely dependent on RID support. With a few groups experiencing success, though, leadership in the RID adopted the promotion of the JMC as a general policy. By 2011, the RID had 170 JMC organizations on record.[75] Officials in the Office of Public Participation Promotion argued that only a small fraction of these groups were actually functioning. Reflecting the statement of an official recorded in the previous paragraph, the adoption of JMC promotion as a general policy of the RID led to

72 Interview, RID officials, Bangkok Thailand, July 2, 2009.
73 Interview, RID official, Nakhorn Phanom Province, June 24, 2009.
74 Interview, RID officials, Bangkok Thailand, July 2, 2009.
75 RID 2011b.

a proliferation of paper organizations within only a few years. Much as with other top-down projects of the RID, the focus has been on quantity rather than quality.

Nevertheless, a few groups have experienced success. I look at two of these groups below. One in the central plains and one in the north. I then provide information on one less successful JMC in the northeast as well as two failed attempts to create JMC, one in the central plains and one in the north.

Krasiew JMC, Suphanburi Province

The central plains are the breadbasket of Thailand. Throughout the Chao Phraya flood plain and the surrounding lowlands, rice production is at a premium. The plains hold the vast majority of irrigated area in Thailand, and the region accounts for approximately 70 percent of the total GDP of the country.[76]

The area has traditionally enjoyed abundant access to water, but that is changing. With the Bangkok Metropolitan Area (BMA) expanding and requiring more water, the amount available for farm use will diminish. The BMA's requirements for water increased from 0.46 million cubic meters per day in 1978 to 7.5 million cubic meters per day in 2000. While only a little over ten percent of the city's water supply official comes from the aquifer, it still cannot sustain such a level of withdrawals.[77] The land Bangkok sits on is sinking at a rate of 10-14 centimeters per year in some locales due to the dropping aquifer, contributing to problems of flooding and drainage. The city will soon be forced to turn to greater reliance on surface water drawn from the central plains.

76 Molle et al 2001.

77 Somkid N.D. These official numbers do not reflect that there is likely a fair amount of illegal pumping going on in the BMA area. Interview, Director of the Institute of Industrial Water Resources and Supplies, Federation of Thai Industries, Bangkok, June 18, 2009.

Surface water distribution in the area depends on arrangements made between the Electricity Generating Authority of Thailand, the Royal Irrigation Department, and the Bangkok Metropolitan Administration. The three agencies regularly negotiate for the release of water from upstream dams in order to meet the needs of all three, with the RID most concerned about maintaining a large enough flow of water to prevent saltwater from moving upstream into Bangkok. Irrigation concerns are secondary at best.

The RID has not had much success in encouraging water user organizations in the area. The flat topography and the larger size of irrigation systems both discourage farmer participation, not to mention the irrigation agency's lack of interest in working with farmers. It is easier for the irrigation department officials to operate systems themselves, and farmers generally have access to sufficient water. In recent years, though, that has changed as alternative droughts and floods have plagued the plains.[78]

One area that has experienced success with water user organizations, though, is the land served by the Krasiew reservoir, located in the northwest corner of Suphanburi Province. The land irrigated by the reservoir is outside of the Chao Phraya flood plain, but the topography of the irrigated area is similar. The Krasiew stream is a tributary of the Tha Chin River, which runs south on a course generally parallel to the Chao Phraya. The reservoir, finished in 1981, sits in the hills of the Dan Chang district, while the irrigation area is split among three other districts, eleven sub-districts, and 50 villages in the floodplain below. Water from the reservoir irrigates approximately 177 square kilometers,

78 For examples see: The Bangkok Post. "Water Level Concern for Central Area." *The Bangkok Post.* April 19, 2009*;* Surasak Tumcharoen. "The Politics of Inundation." *The Bangkok Post.* October 5, 2008*;* Prasit Tangprasert and Sonthanoporn Inchan. "Shoddy Canal Work 'Ruined our Farms.'" *The Bangkok Post.* October 1, 2008.

with about 60 percent of the land being used for rice production. The remainder is used for sugar cane and fruit orchards, 39 percent and 1 percent respectively.[79]

The Krasiew JMC is tasked with management for the entire reservoir system, inclusive of approximately 98 kilometers of canals. Under its authority are nine IWUG and 278 basic WUG. Total membership includes 6,740 farmers. The system also provides the main water source for the town of Dan Chang. It is the water source for two major sugar factories, including the largest in Thailand, Mitr Phol. Local town leaders and representatives from the sugar factories are members of the JMC.

Farmer participation in the system nominally began after its construction when the RID established the basic water user groups for the area. At that time, though, the groups were merely paper organizations. Farmers were often unaware that they were members of an organization, and the local RID office had complete responsibility for the system. Relationships between farmers and RID employees were often adversarial, as farmers' main interaction with the RID was when the zonemen ordered them to follow RID mandated cropping patterns and water schedules.[80] One local RID employee described the RID and the farmers of the time as "enemies."[81]

This adversarial relationship continued for approximately 20 years until 2001 when the Krasiew Dam became one of the five projects for participatory promotion under the ADB ASPL loan. The O&M office of the RID in the area received a grant of 237.9 million baht to increase irrigation efficiency and promote farmer participation. One

79 A deeper discussion of the technical aspects of the system can be found in Wachiraporn 2010.
80 Wachiraporn 2010.
81 Interview, RID employee, Suphanburi Province, May 2, 2012.

official familiar with the Krasiew project explained,[82]

> the ADB forced us to be more involved in institution-building. They said we needed more 'software' because before our operations were different. Usually in the past when we had World Bank funding, we would just focus on building dams or canals. We would build something then it would be abandoned because there was no one prepared to operate and maintain it. This time it was different. We had to create a human side as well.

Officials in the operations and maintenance office at the Krasiew dam were now charged with encouraging farmer involvement in their work. The head of the local office agreed with the ADB recommendations and he became a source of local support for the RID employees tasked with implementing the participatory measures.[83] He assigned a permanent employee to head the participatory portion of the project.

Getting the RID employees to engage in participatory measures was difficult, though. The officials "didn't want to feel like they were losing power to the farmers; they felt like they were losing the capacity to run things and were worried that they would no longer have a job to do."[84]

Beyond resistance in the bureaucracy, farmers also resisted the efforts. They had a long history of mistrust with the irrigation agency, and convincing them that the RID was being genuine in its efforts took time. One official explained, "the RID had to learn to

---

82 Phone Interview, RID official, Bangkok, Thailand, April 30, 2012.

83 Despite being agreeable to the ADB recommendations, most RID employees I talked to referred to themselves as being forced (*thuk bangkhap*) to implement farmer participation.

84 Phone interview, RID official, Bangkok, Thailand, April 30, 2012.

humble themselves. We had to get out of our cars and be the first to *wai*[85] the farmers instead of waiting for them to *wai* us."[86] The process took a great deal of time. RID employees spent approximately three years building trust with the community before they were able to count on farmer participation. One farmer leader explained it thus, "It was very important that they [the RID] humble themselves, and that we humble ourselves to talk together. Not like the RID officials who were here before who thought they were well-educated so they wouldn't work with farmers. People with [local knowledge] need to be heard. It's like this – have you ever had a pig? (Me: No) What if the government came up to you and gave you a pig and said take care of it? You couldn't! The pig would die. It was like that before."[87]

This trust-building process took place while the institutions of participation were being built. Beginning in 2001, RID employees began to visit the previously abandoned WUG in the area. They had training meetings with the groups and encouraged farmers to be more involved in water management. In 2002, they were able to start setting up the IWUG organizations. In 2003 they established the JMC. Unfortunately, official recognition for the new organizations, which according to law should come from the governor of the province, would take until 2007. Despite this delay, the RID employees and the farmers moved forward.

One of the most important efforts involved farmer education. Previously, farmers had little understanding of water limits in the area. RID employees impressed on farmers

85 *Wai* is a traditional Thai greeting denoting respect. When two people greet each other, it is customary for the person of lower social status to initiate the *wai*. RID officials had traditionally waited for the farmers to initiate a *wai.*

86 Interview, RID employee, Suphanburi Province, May 2, 2012.

87 Interview, Farmer Leader, Suphanburi Province, May 2, 2012.

the idea of water scarcity by instructing them on the limits of the reservoir. This instilled a feeling of ownership among the farmers. One RID employee said, "We tried to explain so [farmers] would know that the water didn't belong to the RID. I tried to explain, 'Does it belong to the RID? I don't use it.'"[88]

The farmers began to understand the limits of their water resources and feel responsibility for the reservoir, and they became much more involved in water management. One farmer leader argued that the key to the process were regular meetings. As farmers were able to meet together with RID officials and share information, they were able to build trust within the group and with the RID.[89]

Beyond merely building trust, measurable changes in water management have occurred. Through a farmer suggestion and voluntary labor, the RID and the farmers enhanced the dam, increasing the capacity of the reservoir almost 10 million cubic meters. This extra water is now available for irrigation during the dry season. Farmers also coordinate more regularly with the RID for water management. Farmers manage and monitor water distribution at the local level, which did not happen before. They also regularly call officials if too much water has been released or if it is raining so that the officials can close water gates to conserve resources for a later time.

Farmers and irrigation officials in the area both report that the effort to develop participatory management has been successful. One farmer leader said that through the water user organizations, they feel like they are respected by the government. The change has been drastic. He also said that participating in water management has "almost become

88 Interview, RID employee, Suphanburi Province, May 2, 2012.
89 Interview, Farmer Leader, Suphanburi Province, May 2, 2012.

something fun."[90]

Officials from the RID local office stated that their work in water management has become much easier. There are fewer conflicts between farmers and fewer complaints against the office. Their budget is also able to stretch further as farmers participate to maintain canals and request funds from the sub-district governments for repairs rather than turning to the RID.[91] The old dynamic of an adversarial relationship between the farmers and the agency has disappeared. The JMC also facilitates coordination between the sugar factories, farmers, and the government agencies, which has decreased stress on the local RID office to manage all aspects of water management. One researcher argued that the results have been "excellent co-management."[92]

The farmers and officials in the area have also received rewards recognizing the success of the joint management capacity of the Krasiew irrigation area. In 2010, the JMC received an award from the Office of the Public Sector Development Commission. The next year, 2011, the local RID office was nominated for the United Nations Public Service Awards for increasing public participation in policy making in the Asia and Pacific. While they did not win, the office was shortlisted for the award.[93]

With the Krasiew JMC being successful, if my theory is correct, we should see a degree of political vulnerability occur at the local level prior to the development of the institution. In my field visits, I did not see any evidence of that. While alternating

90 Interview, Farmer Leader, Suphanburi Province, May 2, 2012. In Thai: "*Klai pen ruang sanuk*."
91 O&M Office. 2011. Presentation notes. Office of Operations and Maintenance, Krasiew Irrigation Project, Suphanburi Province.
92 Wachiraporn 2010, 135.
93 For details see, Office of Public Participation Promotion 2011.

problems of flooding and dry season were present, they were no worse nor better than they had been in previous years. Nor did local political competition play into the development of the institutions for participation. In fact, the governor of the province did not even officially recognize the farmer organization until four years after its establishment. At the district and sub-district level, politicians were not particularly interested in irrigation or in working with the RID for irrigation management.

The only possible source of political vulnerability was at the national level, due to the Asian Financial Crisis. As discussed in Chapter Three, during that period the Thai government faced strict requirements from the Asia Development Bank in order to access desperately-needed loans, including in the Irrigation Sector. In order to remain solvent, the government was forced to accept PIM requirement in the Agricultural Sector Program Loan from the ADB. This, though, was standard for the entire country, which does not explain why the Krasiew JMC was the only of the five pilot projects that experienced success.

As for bureaucratic fusion, just as with all other locations in Thailand, the bureaucracy was free from constraint by local politicians. RID officials answer to the central offices in Bangkok. They had no oversight from provincial, district, or sub-district politicians.

Rather than local political vulnerability, the initiative behind the project came from the RID, which in turn developed the project because of pressure from the Asia Development Bank. At the time, though, five large projects were developed to encourage participatory irrigation management. Only Krasiew was successful. Why?

Discussions with officials and farmers provide a number of answers. First, the local official charged with implementing the project was supportive of PIM and encouraged his staff to develop better relationships with farmers. This interest came partly from staffing shortages in the office. In recent years retiring employees were no longer replaced. This meant that the office could no longer continue monitoring and maintaining the entire canal system. Shortly after dam construction was completed, the office maintained a staff of about 130. Now there are only about 50 staff members in the office, and it appears that future retirements will not be replaced. Without farmer assistance, the office would be unable to continue providing the same level of service.

Second, the staff of the O&M office was willing to do what was necessary to cultivate farmer trust.[94] This required that they be willing to apologize for past activities of the RID which offended farmers. They also had to be the first to take the step toward reconciliation. In a culture where saving face is very important, especially for public servants, this was a major step forward. The staff at the Krasiew O&M office were highly committed to implementing PIM.[95] To provide contrast, initially the RID intended to include officials from the Ministry of Agriculture in the JMC. Farmers refused as they

94 One explanation for such behavior could be the dominance of the politician Banharn Silpa-archa over civil servants in the province. He has a long history of demanding greater responsiveness from bureaucrats in Suphanburi than most officials face in other provinces. This causal tale in reference to the Krasiew JMC, though, is shaky. First, Ministry of Agriculture officials who were invited to take part in the JMC, yet they were not responsive like the RID officials. If Banharn's influence were so strong, one would expect it to also influence all officials involved. Second, Banharn has traditionally focused on roads and education promotion. Irrigation development in Suphanburi does not garner as much attention. Finally, no officials I interviewed credited Banharn with any part of the push for the JMC. Instead they focused on the role of the ADB. For more on Banharn, see Nishizaki 2011.
Also, the pressures appeared specific to a set of RID officials. One RID employee expressed his concerns that after he retired in a few years, all the PIM benefits he had worked for would be lost if he wasn't replaced by another individual who understood that the irrigation agency needed to rely on farmer participation. Interview, RID employee, Suphanburi Province, May 2, 2012.

95 See Wachiraporn 2010.

had a poor relationship with officials from the Ministry of Agriculture. Ministry officials did not make the effort that the RID staff did to build trust with farmers. Thus it took over four years of Agriculture Ministry officials informally attending meetings before farmers agreed to allow them to join the JMC.

A third component to the success of the JMC was the geographic advantage of the organization. The Krasiew Dam is a closed system. Farmers in the JMC community do not have to negotiate with upstream or downstream users for water access. The organization is able to control the entire system. This is in contrast to many of the systems in the central plains which rely on the Chao Phraya.

Finally, the success of the JMC is dependent on regular forums for communication among farmers, which provides an obvious benefit to farmers. This institutional innovation is vital to information transfer between farmers, irrigation officials, and representatives from government and industry. For example, at one point farmers in the group were particularly displeased with the two sugar factories for taking more than their share of water. The sugar factories were then able to present their water plans along with presentations from the RID explaining water supplies. The factory representatives publicly apologized for the misunderstanding, and the issue was resolved. Farmers then realized that in order to obtain access to more water they would have to coordinate better with each other rather than blame outside sources, which they began to do.

In conclusion, it appears that my theory does not explain the emergence of the Krasiew JMC, but I have identified a number of vital components which explain its

success. One factor in particular, the attitude of local officials, was also promoted as the source of PIM policy success by one of the main officials in charge of promoting farmer involvement in irrigation. He said, "What's really important is how much the RID officials in the area pay attention to farmers and are interested in PIM." [96]

Mae Yom JMC, Phrae Province

Northern Thailand has a long history of farmer management of water resources. For over 700 years, the *muang fai* communities have been involved in farmer-managed irrigation systems. A *muang fai*[97] is a community organization which develops temporary weirs (*fai*) and canals (*lam-muang*) for water management in the mountains of north Thailand. Community water management was necessary due to topography. Steep mountain grades send water rushing down the slopes during the wet season, and little rain falls during the dry season. Without the construction of weirs, farmers would have been unable to take advantage of water resources.

Historically, water user organizations were granted special status during the Lanna Kingdom (1296-1558 AD), with legal enforcement of water sharing and cooperation. These laws included justification for farmers who killed those caught stealing water.[98] In more recent times, the *muang fai* are ruled by community-developed rules and regulations which include regulations for membership and participation.

The Royal Irrigation Department has expanded less into Northern Thailand than in other areas due to the success of the *muang fai* systems. Demand for government

96 Interview, RID Official, Bangkok, Thailand. May 12, 2012.
97 This is a term in the Northern Thai dialect.
98 Vanpen 2006.

intervention was weaker than in other regions. Even so, the RID has invested in major projects in the region.

One of those is the Mae Yom Weir, located at the north end of the Mae Yom Valley. The Mae Yom River snakes its way along the valley floor on its way to join the Chao Phraya to the south. The valley is home to the provincial capital of Phrae, but it is relatively rural when compared with Chiang Mai to the Northwest.

The 350 meter concrete weir was built by the irrigation agency beginning in 1947.[99] RID water management began in 1962 despite construction on the weir being still incomplete. The project was meant to alleviate both flooding and drought, as the region experiences drastic swings in water availability according to season. During the rainy season water flows at about 1,042 cubic meters/second over the weir, while during the dry season barely 3 cubic meters/second passes through the river.

Despite its early start on the weir, the RID didn't establish any operations and maintenance activities in Phrae until 1973 when construction on the weir was completed and the RID opened the O&M office for Phrae Province. The office was given responsibility over managing the weir and canal system, which consists of two canals. The right canal is 64 kilometers long and supplies water to 29 secondary canals with a combined length of 64.4 kilometers. The left canal is slightly longer at 76.96 kilometers with 40 secondary canals with a combined length of 63.43 kilometers. When the O&M office opened, the government established a number of water user organizations, but by the mid 1980s they were completely inactive. The irrigation agency had quit paying

99 The Mae Yom Weir is the longest concrete weir in the country.

attention to the farmers, so the farmers quit paying attention to the agency. Most had never abandoned the *muang fai* systems in favor of the RID's new organizations.

In 1999, though, the RID became interested in working with farmers again. Unlike in Krasiew, the local office did not take part in an ADB project. Instead officials in the area explained that their interest in farmer participation came from a shortage of RID employees. The budget crisis brought on by the Asian Financial Crisis limited the ability of the office to hire new employees to replace those that had retired.[100] The 1997 Constitution's requirements for more participation played a role as a distant secondary concern. The government officials in the office began to make overtures to the *muang fai* organizations. As they did so, the farmer groups slowly began to respond.[101]

Despite these incremental changes, RID officials and farmer groups still did not have a strong relationship. During the rainy season, this was not a problem. Water was abundant, and the entire irrigation system was able to access water (approximately 88,538 acres). The dry season, though, was very different. Limited water supplies cut access to water to the point that only 6,917 acres could be irrigated.

In 2005-2006, a drought led to even more constrained water resources. Farmer conflicts over water became heated, leading to violence. Farmers and officials interviewed stated that a number of individuals were shot over water disputes, and the upstream district (Song) blocked water flow from reaching farmers in downstream districts. Also in 2006, the RID transferred a native of Phrae from offices near Bangkok

100I could not get exact employee numbers for 1999, but currently the O&M office has 21 employees to manage irrigation on over 80,000 acres.

101Interview, RID Official, Phrae Province, May 24, 2012.

to head the subsection of the O&M office charged with encouraging PIM.

Farmers began to recognize that they needed outside help to coordinate between the different sections of the irrigation system. In the past, farmers were naturally grouped according to their location on the canal: upstream, middle, and downstream farmers. The farmers at the top of the system tended to take all the water during the dry season, leaving downstream farmers to rely on small rivers and streams that flowed out of the mountains into the valley.[102]

Problems between farmers and among the different parts of the system were not being reported to the RID, and the agency was often unaware of underlying issues between farmers. After 2006, though, farmers recognized a difference with the new RID official who was a native of the region. They felt as though he respected them and supported their efforts.[103] They started to petition the O&M office for assistance with coordination. They also applied to the governor's office for help, which in turn put more pressure on the local RID office.

In response, and under the direction of the new official, the RID O&M office began to seek out ways to coordinate the current water user groups in the canal system. There were 62 Integrated Water User Groups and 528 Basic Water User Groups spread across five districts.[104]

As officials began their efforts, they realized that there were a number of other

---

102Interview, Farmer Leader, Phrae Province, May 24, 2012.

103One farmer commented, “Before it wasn't like this. The old RID people didn't really want to help the farmers. [Official's name] has made it much better. When he came here seven years ago, the farmers got much more support. He'd not like the older generation of the RID.” Personal Communication, Farmer Leader, Phrae Province, May 24, 2012.

104Upstream to downstream: Song, Nom Mun Khai, Muang, Sumen, and Den Chai.

issues that needed better coordination. During the dry season farmers had begun to take advantage of water pumps to access water that flowed through the canals and rivers in the area at a level too low for irrigation. These pumps had been built by the RID, but fuel for the operations of the pumps was provided from the Ministry of Agriculture offices nearby. Unfortunately, there was little coordination between the two agencies for monitoring and operating the pumps. Also, the Monsanto corporation had contracted with farmers in the furthest downstream district, Den Chai, to plant corn during the dry season. This was impossible due to water limitations. These organizations needed better information sharing in order to optimize the limited water resources of the area.

In 2010 the O&M office, in coordination with the farmer groups, decided to establish a JMC after learning about it from the RID central offices. The goal of the organization was slightly different from that in Krasiew where water resources were relatively abundant. In the Mae Yom JMC, the farmers know that they won't have the water necessary for a dry season crop. Instead they seek to provide enough water to farmers who have access to water to get a harvest. In many cases the harvest will be limited or poor, but at least the harvest will happen.[105] Thanks to the efforts of the JMC, including construction of temporary weirs in the river, dry season cultivation has expanded to 23,715 acres, an approximately three-fold increase. Not all of this land receives much water, but it receives enough to guarantee a crop.[106]

Beyond managing water distribution, the JMC also serves as a forum where

105Interview, RID Official, Phrae Province, May 24, 2012.

106One leader explained that his area receives only three or four days of water access during the dry season. Thus coordination is vital so that farmers are prepared when water does come. Interview, Farmer Leader, Phrae Province, May 25, 2012.

farmers can learn about which crops are more resilient to water shortage and which crops have an expected high market value. Including industry groups like Monsanto also provides a coordinating mechanism between industry representatives and the RID to determine which areas are more likely to produce the crops they need.

Implementing the water plans required the greatest sacrifice from upstream farmers who had to begin limiting their water withdrawals so that more could be sent downstream. Fortunately there were no ethnic or cultural rivalries between upstream and downstream farmers in system that might contribute to feelings of animosity. Farmers in the system all spoke the Northern Thai dialect and shared a "Phrae" identity.[107] A farmer leader from an upstream group related, "For the first year, it was pretty hard. But after that we were able to adjust to it. We get along. We know that other farmers need it, and we would feel bad or ashamed if we didn't behave and send them some water. When there are many people cooperating and only one being disobedient, he'll mend his ways; otherwise he would be ashamed before his friends."[108]

At the other end, downstream farmers use the JMC to make more appropriate water plans. After the yearly meeting, IWUG representatives to the group are able to take the water plans back to the farmers in their area where they are able to discuss how long they will have water during the dry season. From this discussion, farmers are able to plan their cropping patterns.[109]

Through the JMC upstream and downstream water users have been able to

107 At meetings farmers and irrigation officials often choose to wear *Mo Hom* shirts, a style of shirt made of a blue material indigenous to the valley, as a a sign of local identity.
108Interview, Farmer Leader, Phrae Province, May 24, 2012.
109Interview, Farmer Leader, Phrae Province, May 25, 2012.

coordinate their water needs and improve the availability of water overall. Both officials and farmers interviewed argued that the organization had been effective in promoting better access to water resources and greater cooperation between the irrigation agency and farmers. The success of the irrigation system also led the Mae Yom Operation and Maintenance Office to receive a 2012 United Nations Public Service Award for Fostering Participation in Policy-Making Decisions through Innovative Mechanisms for Asia and the Pacific. The officials in the office were especially proud of this achievement, as they had been chosen for the award over groups from Australia and South Korea.[110]

If my theory is correct, this success should have grown from the presence of political vulnerability in the area. It does seem that there was a degree of vulnerability brought on by drought conditions. As noted above, in 2005 and 2006 a limited water supply led to a number of water conflicts in which farmers fought and even died over water. Due to these conflicts, farmers put pressure on the provincial governor for assistance.

Unfortunately, the causal chain is slightly fuzzy, and there is evidence suggesting that my model does not hold much explanatory power in this context. While the local political leaders, such as the governor and district and sub-district chiefs, did get involved in drought mitigation promotion, the initial response was not to establish greater participation in irrigation management. Instead, the agencies involved responded by building irrigation pumps to move water from the river into irrigation canals.

This, though, involved a complex series of tasks to manage and monitor the

110Interview, RID Official, Phrae Province, May 24, 2012.

limited resources, which the irrigation office was unable to handle alone. Beginning in 1999, their staff numbers had significantly dropped, and they were forced to rely on farmer cooperation for monitoring irrigation systems. Relying in farmer coordination, especially across such a large basin, became even more important as drought conditions persisted. Farmers were also expanding their dry season cultivation. In order to make sure that farmers would be prepared for water as it became available and appropriate crops would be planted in areas that would receive little water, the agency had to cooperate closely with farmer leaders.

The RID officials also had to coordinate with five district governments, the Ministry of Agriculture, and industries in the area. The district and sub-district politicians, some of whom were farmers, were especially sensitive to farmer demands.[111]

Thus there was a degree of political vulnerability expressed by local government officials, but this had to be translated through the irrigation agency. If the agency had been able to operate the system by itself, it might have. Thanks to the staffing shortages, though, the O&M office was forced to turn to farmers. As one official explained, "We have over 200,000 *rai* (approximately 83,000 acres) under this irrigation office, and there are only 21 employees. Each one is assigned 30 to 40 water user groups to work with. They can't visit them all. The farmers have to be able to monitor themselves and then report back to us what the problems are."[112]

As for the level of bureaucratic fusion, it was high according to the measures set

111 Two of the farmer leaders I interviewed were also elected members of the *Tambol* (Sub-district) Administration.

112 Interview, RID Official, Phrae Province, May 24, 2012.

forth above. Irrigation officials were generally independent from working with local governments.[113] The national RID offices in Bangkok exercised authority over local officials, and those officials did not face any serious repercussions for ignoring local government leaders.

This leaves us with some degree of political vulnerability and a relatively high level of bureaucratic fusion. What then explains the irrigation official's interest in PIM? One of the answers, indicated above, was the resource shortages in the RID office. This cannot completely explain the success, though, as all RID offices across the country face the same staff shortages yet only a few have embraced PIM. Something else is at work.

One explanation, closely linked to the resource shortages in the RID office, was that farmers and RID officials in the area had found that they could rely on sub-district governments for monetary assistance for irrigation maintenance. An application for infrastructure maintenance from the RID was a lengthy process. Sub-district governments were much more responsive. Thus, RID officials were inclined to rely on the sub-district governments in the area.

A second aspect, also found in other areas, was the personal effect of the official who spearheaded the PIM efforts in the Mae Yom system. After he was transferred into the office in 2006, farmers felt much more comfortable cooperating with the agency. He was a native of Phrae, and he spoke the local dialect. He had relatives who were farmers. The farmers felt much more comfortable approaching him.

Beyond that, the official expressed an interest in working with farmers that was

113One interviewee who worked in local government argued that prior to the JMC, the RID basically ignored the sub-district governments. Interview, Farmer Leader, Phrae Province, May 24, 2012.

rare among irrigation officials. He personally felt that working with farmers was important, despite the fact that it didn't provide him material benefit. He said, “If you ask, I could be lazy and sit at the office and not work with farmers. I could. Who would lose? Not me. I would get paid just as much. I would probably get a promotion sooner, as I would have more time to do other work. The farmers would lose.”[114]

One final issue which seemed to benefit the development of the JMC was the close link between water user organizations and the local governments. Water user group leaders often were also local politicians. Because of their awareness of issues in the water user organizations, they were able to present those needs to the sub-district government. This increased the efficacy of the organizations, and provided a level of responsiveness that farmers could observe. Such ties between local government and water user organizations has historical precedent in the area, as the *muang fai* were closely linked with local governments. Management of water resources was vital to local political leaders' success.

In conclusion, it seems that political vulnerability did have some role to play in the development of the Mae Yom JMC, but it alone was likely insufficient. Thanks to the local RID official's personal connections and interest in farmer welfare, the vulnerability which arose due to water shortages developed into institution-building.

Less-Successful JMC Attempts

As noted above, Thailand has approximately 170 JMC on record. Most of these, though, are ineffective or exist only on paper. Officials in the Office of Public

114Personal Communication, RID Official, Phrae Province, May 24, 2012.

Participation Promotion estimate that fewer than ten could be considered active.[115] The remainder were established to align with a 2011 policy promulgated by the central RID office.

One of the main problems facing state actors who wish to establish a JMC is that it is designed to be a bottom-up organization, with information traveling up from the basic water user groups through the integrated water user groups and finally being discussed in the committee meeting. Unfortunately, the RID has approached the establishment of these organizations through top-down measures, which has resulted in an overwhelming majority of unsuccessful groups.

Unsuccessful groups are difficult to profile for a number of reasons. First, information on them is scarce. Officials don't discuss less-successful organizations, nor do they collect data concerning them. Reports are not written, forms are not filled out, and minutes of meetings don't exist. Farmers in the area are often unaware that the JMC even exists, as it is primarily a paper organization developed in the RID office.

Second, the RID is reluctant to provide information about less successful organizations. While the agency is proud to show off successes, the opposite is true of non-success. This holds true from top officials to field officers who are sometimes ashamed that they don't have anything positive to show an outside researcher.

Because of these factors, my research on less successful JMC relied on attempts to find pairs with the two successful organizations. I identified one attempt to create a JMC in the upper central plains, which shared some characteristics with the Krasiew

115Interview, RID Official, Bangkok, June 19, 2012.

organization, and one attempt to develop a JMC in Northern Thailand which resembled the Mae Yom organization. Unfortunately, the RID was unable to provide me contacts in these areas, so I was forced to rely on sources in the RID library and interviews with officials in Bangkok who were involved in the attempts.[116] I also visited a third JMC, developed in Northeast Thailand.

In this section I present information from one less-successful JMC organization and two failed attempts to establish JMCs. First I examine the Lower Ping River Basin, in the upper central plains, and the Mae Lao River Basin, in the northern mountains. Both were included as large irrigation projects to be rehabilitated by the ADB agricultural sector program loan. Funding for improving the systems was allocated to the local O&M office, which was also charged with developing a PIM component. The program operated on the premise that basic water user groups and integrated water user groups would be strengthened prior to establishing a JMC. After presenting the two projects, I turn to the Baan Khiaw JMC found in Nakhorn Phanom province, which was established in 2008 to manage a small reservoir.

The reader will notice that the information I gathered is less extensive than that available for successful groups. This data limitation is partially a function of the fact that they are less successful.

Lower Ping River Basin

116 Contacts in the field offices were vital to my field visits. The RID is a large organization with approximately 30,000 employees. Without permission from the central irrigation office and an introduction, the head of the field office would have been unlikely to allow me to conduct interviews with his staff. Also, without those contacts, I would not have known which farmers to contact to discuss the JMC.

The Lower Ping River Basin is located in both Kamphaengphet and Nakhorn Sawan Provinces, where the Ping River descends from the mountains of Northern Thailand and meanders to join the Chao Phraya River. This area had few permanent canal structures, and it suffered from regular flooding during the wet season. Water was relatively abundant, much like in the Krasiew system. The main goal of the project in the basin was to increase the number of cement-lined canals and improve management of water to meet farmer needs.[117] Informally, the RID officials rank this project second in terms of effectiveness out of the five which were involved in the ADB program; even so, it is not considered successful as an organization.[118]

From 2001 through 2003, the project was allocated 647.492 million baht (about USD 16 million), with 51.86 million baht (about USD 1.3 million) of that amount dedicated to improving management of they system through farmer participation.[119] In the end, the Lower Ping River office budgeted approximately 4.85 percent of the loan money for working with farmers. The vast majority of the remainder (86.24 percent) was dedicated to construction and rehabilitation of infrastructure. Prior to the loan being canceled, the O&M office had spent about USD 587,500 on strengthening the farmer groups.

The area held 267 basic water user groups and 36 integrated water user groups, which had all been established in the past but had become inactive. The first step of the

117Much of what follows is drawn from RID 2004a.

118Interview, RID official, Bangkok, May 12, 2012.

119It should be noted that 40 percent of the money dedicated to improving management was spent on developing computerized systems for water management, which was eventually abandoned due to the cancellation of the loan. In the end, only about USD 780,000 was geared toward farmer participation. Only 75 percent of that was used prior to the loan cancellation.

ASPL project was to resurrect these organizations. According to reports this task was completed. The agency hired 71 community organizers to work with the water user organizations in 2001, but attrition was a problem. Only 49 community organizers remained on the job throughout the contract period.

Following the reactivation of the groups, they were to be trained to handle water management in conjunction with the RID officials. Officially, this training was completed for a portion of the groups.

Despite the agency's claims that it was successful at some initial tasks, it was unable to complete its plans with the water user organizations. The official reason was that the infrastructure construction and rehabilitation was not completed as planned, which limited the agency's work with water user organizations.[120] The final report states, "As of the rainy season 2002 and dry season 2003, none of the nine planned activities [in participatory operation and maintenance] were completed because the rehabilitation of the system was not yet completed."[121] Statements like this are indicative of fact that participation was a low priority in the project, as farmer participation was not included in the rehabilitation efforts. The local office had planned that farmers only became involved once construction work of the RID was finished.

Interviews with officials in the Office of Public Participation Promotion in Bangkok provided further information as to the reasons behind the failure to establish a JMC. Initially, the topography and water resources of the area diminish farmer interest in water user organizations. Very few canals in the area are concrete, indicating that, up until

120ADB 2003b.
121RID 2004a, p. 4-9.

this point, the RID expressed little interest in the area. Farmers are accustomed to taking care of their own water needs without working closely with the irrigation officials, exhibiting some characteristics similar to the *muang fai* of Northern Thailand. Water is also relatively abundant, leaving farmers feeling that there was little benefit in being involved with the RID. This meant that RID would have to make extra effort to establish a relationship with farmers there.

The local irrigation office did not exhibit much interest in working closely with farmers. Unlike Krasiew, the RID officials in Kamphengphet and Nakhorn Sawan did not pay attention to farmers.[122] They had little incentive to, as the time line provided in the budget for improving irrigation in the Lower Ping River area only gave them a short time to report results, sometimes in as little as three months. Empowering and strengthening a water user organization usually takes longer.

Lest we mistakenly believe that there is no need for a JMC or some other type of coordinating body in the Lower Ping River Basin, the Thailand Research Fund has recently funded attempts to develop a water management authority for the area. Poorly-planned infrastructure projects, such as canals and roads, have created a series of problems for the people who live in the area. Flooding and drought alternate according to the season. Without coordination between water users, local governments, and the irrigation agency, the situation has deteriorated.[123]

As far as I was able to gather, there did seem to be some degree of political vulnerability in the area. Local leaders are aware of the problems of flooding and

122Interview, RID Official, Bangkok, May 12, 2012.
123Praphan 2012.

drought, and they have expressed interest in resolving those issues. The sub-district offices have spent money trying to alleviate these issues, but due to the size of the basin relative to sub-district boundaries, they are unable to do much without coordination across the basin.[124] The ADB loan also provided some pressure for increasing PIM. Unfortunately, institutions necessary for farmer-agency coordination and cooperation have not emerged.

It seems that bureaucratic fusion is in play. The local RID offices are not beholden to local politicians for approval or assistance. They lack interest in working with farmers, and the RID structures do not provide incentives for them to do so.

Thus my theory seems to be in line with the situation in the Lower Ping River Basin.

Mae Lao River Basin

The Mae Lao River is located in Chiang Rai province in Northern Thailand. It, like Krasiew and the Lower Ping River Basin, was chosen as the location of one of the five large projects for improvement in irrigation management through the ADB loan.

Mae Lao was allocated 680 million baht (about USD 17 million) from the loan, more than either Krasiew or the Lower Ping River Basin received. Despite receiving more money, the irrigation office in Chiang Rai allocated less money in both amount and percentage than either with only 10.2 million baht (about USD 255,000) or about 1.5 percent of the budget to promoting water user organizations.[125] This money was dedicated

124Phraphan 2012.
125 RID 2004b.

to training 34 water user organizations which existed in the basin.

Prior to the initiation of the project, the farmers in the area were very active in managing their water resources and canals. Much like discussed in Mae Yom, the farmers were involved in *muang fai* organizations, which operated independently of the irrigation agency.

Unfortunately, officials in charge of the ADB project never considered farmer participation very important.[126] The project focused on construction, with minimal input from farmers. This hindered efforts to develop greater farmer-agency collaboration, and in the end no JMC was formed to manage the irrigation system. One official in the Office of Public Participation Promotion lamented this, "It was too bad that in Chiang Rai we didn't have someone like in Krasiew. The farmers there were very active and ready to participate. They were probably 70 percent there to begin with. But the irrigation officials didn't do what they needed to do."[127]

Data on Mae Lao was insufficient to determine whether or not local government felt political vulnerability regarding irrigation. While the ADB did promote PIM in the area, that pressure was relatively light and placed on the RID officials rather than local politicians.

Bureaucratic fusion was the same as in all other groups in Thailand. The irrigation agency was able to control the policy process completely with little input from local

126 The official report of the project only included a few lines on the agency's work to empower water user organizations, instead focusing almost completely on budgetary considerations and construction. This contrasts with reports on Krasiew and the Lower Ping River Basin, which both included at least a few pages reporting the agency's efforts to implement PIM.

127 Interview, RID Official, Bangkok, May 12, 2012.

government.

Thus, based solely on the bureaucratic fusion variable, my theory would predict that institutions for PIM would not emerge, which was the case. Again, though, it seems that the personal effect of irrigation officials truly mattered. With a similar level of bureaucratic fusion in Mae Yom and in Krasiew, officials who were interested in PIM were able to overcome the obstacles in the way of participatory institutions.

Baan Khiaw JMC[128]

Nakhorn Phanom province hugs the banks of the Mekhong River on the Northeast border of Thailand. The province, despite being remote from Bangkok, is important as the location of one of the most sacred Buddhist sites in the Isaan at That Phanom. People in the area, as discussed in the section at the first of the chapter, are relatively poor and depend on rain for their crops. Because of this, the irrigation agency's main method of improving irrigation has been through developing a series of small reservoirs, which can provide water during the dry season.

One such reservoir, Baan Khiaw, is located just north of the main highway between the provincial capital Nakhorn Phanom and the neighboring provincial capital of Sakon Nakhorn. It it located in the same district as the provincial capital. In the past decade, the people of the area have observed many changes, as department stores and even shopping malls have popped up in the nearby provincial capitals, spurred on by increasing numbers of the middle class.[129] These changes, though, are not due to increases

128 I have changed the name of this WUO to preserve its anonymity and protect its members from embarrassment.
129 Walker 2012.

in agricultural production in the area. Instead they are encouraged by remittances from locals and their children moving to the cities for work, only returning seasonally to farm.

The Baan Khiaw area is especially affected by this out-migration of the younger generations. Farmers who draw water from the reservoir are all elderly, and many of them even maintain secondary jobs in nearby towns. Thanks to the availability of water from the reservoir, farmers are able to harvest two crops a year, but it is not enough to free them from requiring outside employment.

Prior to the formation of the JMC, the farmers in the area were organized into a water user association. Water user associations have a long history in Thailand, as discussed in Chapter Three. They were established beginning in 1963 to encourage farmer participation in water management. The organizations were also meant to help farmers develop credit, access fertilizer, and facilitate agriculture extension. Relationships between the irrigation agency and farmers, though, were strained as the RID sought to control WUA. Eventually, the agency quit promoting them in the 1980s.

Much like other WUA, the association which was meant to assist in the management of water from the Baan Khiaw reservoir had fallen into inactivity. Conflicts over water access occurred, but the social ties of the community generally mitigated these.[130] The WUA in Baan Khiaw was reactivated in order to assist the creation of the JMC. Even though the organization had not been active for many years, the farmers had still worked together due to social pressures and a familiarity with each other. This continued cooperation was what allowed the RID to, relatively quickly, establish a JMC

130 Interview, Farmer Leader, Nakhorn Phanom Province, June 24, 2009.

in the area.

In 2008, the RID office in Nakhorn Phanom decided to create two JMC in the province, one at the Baan Khiaw reservoir and one at Ban Dong Noi reservoir. That May, a meeting was held establishing the organization in Baan Khiaw.[131]

An RID official explained that the JMC was necessary as budget shortages had limited the capacity of the RID to operate and maintain the irrigation system in the area. The RID was being forced to rely on farmers. He went on to explain that despite the development of the JMC, he was still skeptical of the farmer's ability to manage water without the irrigation agency's help, "the public is just not educated enough to deal with irrigation."[132]

The JMC was formed with local government leaders from the sub-district and village level as officers. Ten members of the water user association became members of the committee, but they did not hold leadership positions in the organization. With only 10 members from the water user group, they held less than 50 percent of the positions in the committee. The remaining positions were divided between officials from the Ministry of Agriculture, Royal Irrigation Department, and farmers from outside the water user organizations.

The JMC was less successful. Officials in the Office for Public Participation Promotion argued that most of the resources and investment in the group came from the RID, rather than participation of farmers. One said, "80 percent of the force for the

131 Meeting Report, Baan Khiaw O&M office, May 20, 2008. Accessed at Baan Khiaw O&M office.
132 Interview, RID Official, Nakhorn Phanom Province, June 24, 2009.

creation of the group came from the Royal Irrigation Department."[133] My own visit to the group left me with the same impression. Farmer leaders, although genuinely interested in managing water, seemed relatively unable to control the organization.[134] Their participation seemed more at the behest of the Irrigation Department. This visit occurred in 2009; when I returned to Thailand for continued field work in 2012, the central RID offices no longer kept information on the organization, which indicates its relative importance and level of success.[135]

What led to this group's inability to become a success? The main issue was the lack of sustained training and development of farmer capacity. Farmers who were involved in the group were not particularly enthusiastic about it; the RID was the main driver behind the institution. Interviews with officials elicited responses that they felt that farmers were incapable of managing themselves without RID direction. This meant that the efforts to develop the JMC were top-down and involved little farmer participation. In the drive to develop participation, participation was ignored.

Analysis of JMC Cases

The three JMC organizations and the two failed attempts to establish a JMC provide a few insights about the establishment of WUO. First, incentives within the bureaucracy do not encourage developing effective institutions for participatory water management. While these can be overcome, they generally prevent local political pressures and the demand for better water management to result in institution building.

133 Interview, RID Official, Bangkok, July 2, 2009.
134 Interviews, Nakhorn Phanom Province, June 24, 2009.
135 Personal E-mail Communication, RID Official, September, 2012.

Instead, irrigation officials focus on construction and system rehabilitation as the solution to irrigation pressures. Thus, without major reforms to the incentive structure within the RID, it is unlikely that we will see anything more than sporadically successful groups.

Second, political vulnerability at the local level seems to play only a supplementary role when placed within a context of bureaucratic fusion. While local political leaders did, on occasion, feel vulnerable to irrigation issues, they were not able to translate that into institution-building necessary for PIM. This was in large part due to the fact that local politicians have no direct control over the irrigation agency. At best they can contract the agency to conduct construction in their area, but affecting the incentives of the irrigation officials through formal channels is well beyond their purview.

Third, the negative incentives within the bureaucracy can be overcome through individual commitment to a participatory approach as seen in Mae Yom and Krasiew. In both cases, irrigation officials invested time and effort into encouraging the development of PIM institutions. They did this despite the difficulty of the task. It appears that in both cases, this impetus came from the bureaucrats themselves. In Mae Yom, the official who presided over the PIM effort had connections with the local community as well as an understanding that farmer participation was necessary to overcome staffing shortages in his office. In Krasiew, the official in charge had tasked his permanent employees who were natives of the area with developing the system. They had to spend a great deal of time to the project, including humbling themselves to demonstrate that they served farmer needs. One remarked that the payoff for such work did not come until many years

after the initial investment.[136] Thus, it appears that the individual effect of a well-placed official committed to service provision has a very strong effect.

Conclusions

As noted in each analysis section, the case studies above provide us with a number of lessons about the development of PIM under conditions of a centralized irrigation agency, which contrasts to the Indonesian case. Because of the centralized nature of the agency, local political needs are unable to affect the incentives of irrigation officials. In fact, some interview respondents indicated that they even had incentives to completely ignore participation in their work, despite the need for it.

What does this mean for my theory? In essence, it demonstrates that bureaucratic control over the policy framework at the local level, in the absence of a national participatory framework, makes the development of participatory irrigation management much less likely. Pockets of participation occur due to somewhat idiosyncratic causes, such as a group of active farmers or an altruistic official, but there is little correlation between a local pressure for better irrigation management and the development of PIM.

In essence, these cases demonstrate that, in order for Thailand to experience broad-scale success at participatory irrigation management, the Royal Irrigation Department needs to reform the incentive structure for street-level bureaucrats. Otherwise, the best that we can expect is sporadic cases of success. This is due to the role of bureaucratic fusion, which places control over policy in the hands of officials who are, in many cases, divorced from the local situation. These officials do not place much value

136 Interview, RID Employee, Suphan Buri, May 2, 2012.

on working closely with farmers, as their raise and promotion structure is not based on it. As one official said, "[working with farmers is] not a duty, it's a burden."[137]

Table 5.3, found at the end of the chapter summarizes the information found above.[138] As the table demonstrates, every case I investigated in Thailand was subject to local bureaucratic fusion. This would suggest that none of the groups should become successful, yet we see that some effective WUO have emerged.

From the cases above, I drew out a number of factors which could help explain the relative success of certain cases. The only cause I did not include in the table which appeared repeatedly in my analysis was the role of staffing shortages in the bureaucracy. I didn't include this as the problem was endemic to all RID offices around the country. Each of the cases I looked at suffered from staffing shortages. This implies that resource limits alone were insufficient to spur street-level bureaucrats toward institution building, although resource limits might be a necessary condition. Unfortunately, as this condition was found among all my cases, as well as all the cases in Indonesia, I cannot conclusively say whether or not it was a necessary condition.

In three of the successful cases, water resource shortages were important, as was the ability of farmers to organize by themselves. Both of these conditions, though, appeared in unsuccessful cases, so they are not alone sufficient to encourage the development of an effective water user organization. Also, local political vulnerability

137 *Mai chai nathii tae phara.* Interview, RID Official, Bangkok, June 19, 2012.

138 I have set up this table to provide easy access to the information. It does not contain all of the many inputs for each of these groups discussed above, nor does it necessarily imply causal effect. Without the accompanying discussion of my case studies, one could, at best, draw weak correlations between inputs and the dependent variable.

and support from a local politician were only important in two cases. Thus these alone cannot explain success. Indeed, it is more likely that local political vulnerability led to the supportive local politician. But in circumstances of local bureaucratic fusion, other factors are better determinants of the emergence of a successful WUO.

From the table, we also see that in all cases of either high or medium success, the provision of an obvious benefit to farmers was an important contributor. We might even say that this was a necessary condition for the success of a water user organization. In each of the less successful cases, though, there was little or no obvious benefits to farmers from the WUO. I am hesitant to conclude that this alone was a sufficient cause for the groups' success, though, as it was paired with other conditions in every case except the Khao Sai Weir Committee. Khao Sai, though, benefited from two other circumstances. First, although the group did not have a supportive local RID official, it was the beneficiary of the TRF-trained community organizers. Also, the group's small size likely contributed to its success.

The other condition that is present in all successful cases except Khao Sai Weir Committee is the presence of a supportive local RID official who works closely with the water user groups. From the preceding discussion, we know that this was vital to the establishment of the Krasiew and Mae Yom JMC. In both the P4 and P2 groups, farmers organized to establish their groups, but working with a favorable official was also important to the development of the group. In Khao Sai, community organizers substituted for a supportive irrigation official. The role of an interested civil servant was stressed by an official from the Office of Public Participation Promotion, “What's really

important is how much the RID officials in the area play attention to farmers and are interested in PIM."[139] Thus it appears that at least a moderately supportive RID official was a necessary condition to the successful development of a water user organization for farmer-agency collaboration.

The cases presented above do provide some support for the bureaucratic fusion part of my argument in that the individual activities of local officials who engage in participatory efforts seem to be against their bureaucratic incentive structure and should be rare. Instead, in the majority of cases, bureaucratic fusion should prevent the formation of institutions for PIM, which seems to be the case in Thailand. In fact, the discretion allowed bureaucrats in the Thai irrigation policy framework seems vital to explaining the variation seen in my cases. Discretion allows those bureaucrats who feel inclined to work with farmers to do so, although it is a sacrifice that may hinder their promotion potential. In order for successful PIM to become more widespread, Thailand's irrigation agency will have to reform the incentive structure of street-level bureaucrats. Without such changes, the half-hearted policy declarations of participatory management will fall on deaf ears and the best that we can hope for the future are continued pockets of participation.

In the concluding chapter I discuss these findings in greater detail, comparing them with the Indonesian cases and placing them within the context of the entire dissertation.

139Interview, RID Official, Office of Public Participation Promotion, May 12, 2012.

Table 5.3: Thai Case Study Evaluations

	Local Bureaucratic Fusion	Local Political Vulnerability	Supportive Local Politician	Supportive Local RID Official	External Pressure for PIM	Obvious Benefit to Farmers	Water Resource Shortages	Independent Organized Farmers	Level of Success
P4 Water Management Committee	X			X		X	X	X	High
P2 Water Management Committee	X	X	X	X		X	X	X	Medium
Khao Sai Weir Committee	X					X			Medium
Baan Yang Weir Committee	X								Low
Krasiew JMC	X			X	X	X			High
Mae Yom JMC	X	X	X	X		X	X	X	High
Lower Ping Basin	X	X			X				Low
Mae Lao River Basin	X				X		X	X	Low
Baan Khiaw JMC	X						X		Low

Chapter 6

Conclusion

In 2009, an official from Thailand's Royal Irrigation Department explained to me the country's policies and institutional framework regarding water user organizations. With my farming background, I had experienced first-hand the capacity of farmers for innovation, cooperation, and management of irrigation systems. The policies of the RID seemed to discourage such farmer involvement. When I expressed that sentiment, the official responded, "[the irrigation agency] likes to see development, just not the ideal development." In many ways, the sentiment expressed in that statement depicts many irrigation agencies throughout the world. They are littered with negative incentives that inhibit agency capacity to accomplish difficult developmental tasks, especially in the important realms of operations and maintenance where farmer participation is most vital.

The previous chapters have explored the source of some of these incentives as well as efforts to change them and encourage state actors to invest in the water user organizations necessary to accomplish the difficult developmental task of irrigation management. At the risk of redundancy, my argument has focused on exogenous political vulnerability emerging from food security concerns or pressure from international donors for improved irrigation management at the national level. Such vulnerability can threaten the tenure of political leaders and force them to engage in the costly process of institution-building and policy reform. Vulnerability may be necessary, but it is

insufficient alone to guarantee the changes necessary to develop water user organizations.

The policy-making role of the irrigation agency is also a determining factor for reform. Irrigation agencies have a number of natural incentives to avoid modification. If reforms of the irrigation agency are successful, many top-level officials could lose access to resources and may even be forced into retirement or promoted to posts with little influence. Thus, if they are able, they will seek to limit such changes. I argued that under conditions of high bureaucratic fusion, or a condition under which a bureaucratic agency is able to control the policy-making process through either political or institutional considerations, the agency will block reform efforts to protect their interests.

Only under conditions of high political vulnerability and low bureaucratic fusion will a country engage in the necessary policy shifts and reforms to encourage nation-wide institutions for farmer-agency collaboration. In the absence of these conditions, the institutional framework that emerges creates an environment where a great deal of sub-national variation can emerge. I further contended that my theory can be rescaled to the local level, showing us how local political vulnerability and local bureaucratic fusion can shape the implementation of policy and explain this sub-national variation.

In this chapter, I briefly revisit the evidence presented and the conclusions drawn from it. After that, I reconsider the concepts of political vulnerability and bureaucratic fusion and their utility. Then I turn to some other factors that the empirical evidence has brought to light. Finally, I conclude with some thoughts on irrigation policy.

What We Have Learned

The previous chapters have presented a line of reasoning that poor institutions are

the result of either insufficient political pressure or the interference of a politically-powerful bureaucracy that prefers the status quo. Indonesia, presents a strong example of what happens when political pressure meets with an unrelenting bureaucratic force. In contrast, Taiwan and the Philippines show that political vulnerability due to food security concerns can lead a state to engage in the difficult task of institution-building necessary for better governance of water resources.

The evidence presented in the dissertation, at least on the national level, seems to provide some support for my argument. The country cases demonstrate the causal chain through which the forces of political vulnerability and bureaucratic fusion interact to promote the evolution of certain types of policy while hindering others. In Taiwan, the prospect of war pushed the KMT government to focus on food security and developing links between the state and rural groups. When food security was threatened due to a drought in 1954 and falling rice production in the early 1970s, the government invested in policies specifically tailored to create and modify the institutions for farmer-irrigation agency collaboration in water resource management. Officials in the Irrigation Associations were tied to farmers through the medium of water user fee payment, which was monitored by the central government. Close links between farmers and officials were also cultivated through a number of other means, including the physical proximity of officials to their workplace, water rights given to the associations, and a legal framework which benefited farmers. Through these mechanisms, officials and farmers worked together to co-produce irrigation service.

Taiwan's success in institutional development has been explained as a

consequence of systemic vulnerability.[1] While it is true that the combined external security threat, threat of rural uprising, and resource limits likely also played a role in the development of irrigation on the island, that story lacks specifics. Why did institution-building reach all the way to irrigation? Why was developing industry not enough? I argue that systemic vulnerability is not exclusive of political vulnerability.[2] Indeed, political vulnerability as a sub-set of systemic vulnerability, especially in the realm of food security, seems to have directed the KMT party's eye toward institution-building in irrigation.

In order to provide evidence that the success in Taiwan was not driven purely by the country's developmental success, we are able to look at the alternate example of the Philippines. Filipino politicians, especially presidents, were especially vulnerable to fluctuations in the price of rice, an issue closely linked to irrigation. Beginning with independence, each administration sought for ways to increase the supply of rice and guarantee low prices for their constituents, with little success. This vulnerability led to the creation of the para-statal National Irrigation Administration, loosely based on the pattern found in Taiwan. The NIA's initial mission was to expand irrigation systems, which it did, allowing the Philippines to become a net rice exporter for the first time in 1968. This success contributed to President Marcos' successful re-election campaign, the first in Philippine history.

When a financial crisis hit and Marcos led a transition to authoritarianism, he publicly claimed his legitimacy to rule was partly based on food security. With the

1 Doner, Ritchie, and Slater 2005.
2 See my argument in Chapter 3 as well as further discussion in my section on Political Vulnerability below.

government coffers bare, though, Marcos was forced to push the NIA to become more effective with fewer resources. Presidential decrees compelled the NIA to depend on farmer contributions of water fees, thus creating some economic pressures for the agency to collaborate with farmers. The agency turned toward efforts to encourage greater farmer participation in operating and maintaining irrigation systems. The legal framework of water rights also privileged irrigation associations. This policy framework and the accompanying bureaucratic reforms led the NIA down a path of farmer-agency collaboration and participatory irrigation management. Irrigation associations were established for co-management of water resources, and the early projects indicated that participatory management was much more successful than those systems which had not yet expanded the role of farmers in operations and maintenance. The Philippines was able to experience a number of years as a net rice exporter from the 1970s through the 1980s.

Unfortunately participatory irrigation management in the Philippines never reached the level of success experienced in Taiwan, as the policy framework and thus the incentives of irrigation officials changed after the 1986 transition back to democratic rule. Pork-based policies in the 1990s removed much of the policy framework which had privileged PIM. By 2000, many officials within the NIA no longer praised its para-statal nature and some have recently expressed interest in being nationalized as a normal part of the Philippine bureaucracy.

Political vulnerability in the absence of bureaucratic fusion led both Taiwan and the Philippines toward institutional development in irrigation. Water user organizations in both countries grew out of the policy framework developed by governments facing the

threat of food security. Neither had strong bureaucratic agencies which could protest policy as it came down from politicians to fit the agency's interests.

In contrast we saw the experience of Indonesia. While food security was an issue for the Suharto government, it was treated primarily through the expansion of technical irrigation systems. Building new infrastructure and expanding the irrigated area allowed the Department of Public Works to maintain centralized control over irrigation management while increasing rice production. In 1984 the country became self-sufficient.

Shortly thereafter, though, Indonesia faced monetary pressures due to fluctuations in the price of oil. In the late 1980s, the Department of Public Works was forced to rely on money from the World Bank. In order to meet loan requirements, the country developed the 1987 Irrigation Operations and Maintenance Policy, which called for the establishment of water user groups. These groups, though, existed merely to appease foreign donors. They were rarely treated seriously, and officials expected little of them beyond a cheap source of labor for projects.

By the time of the 1997 financial crisis and the fall of Suharto in 1998, Indonesia had again become a net rice importer. As the country struggled to pay its employees and thousands upon thousands of Indonesians fell into poverty, the World Bank and other foreign donors gained an upper hand in bargaining for participatory irrigation management policies. Indonesia's dire circumstances coupled with the influence of international donors pressured politicians for deep reform.

The shaky government moved forward, disbanding the Ministry of Public Works and creating new ministries to implement the reforms. Presidential decrees turned

authority over to water user groups and empowered them. Yet the political vulnerability and bureaucratic weakness was short-lived. When the Wahid presidency fell and Megawati rose, alliances between politicians and bureaucrats from the former Ministry of Public Works began to shape the legislative process in water policy. The banished Ministry of Public Works returned, the 2004 Water Law unraveled the institutional changes of the previous five years, and Indonesia's water management plans again resembled those under Suharto. The World Bank could do nothing but cancel the remaining disbursements of its loan program in protest. With low levels of political vulnerability, the bureaucrats had returned to their privileged post as the main composers of irrigation policy.

This case demonstrates the effect of a politically powerful bureaucracy under conditions of political vulnerability. While pressure on politicians led to new efforts to reform the irrigation agency, forces within the bureaucracy were able to resist those attempts and eventually repeal many of the reforms for PIM. This indicates an interesting dynamic between the strength of bureaucratic fusion and political vulnerability, which is discussed in greater detail below.

Finally, Thailand's experience with water user organizations has been defined by a series of top-down programs brought about primarily by the Royal Irrigation Department. Legislators and politicians were rarely involved with the development of policy for water user organizations, as they faced little to no vulnerability in the issue. Thailand has never faced a shortage of rice, and water supplies are generally sufficient. Beyond that, Thailand's legacy of “bureaucratic polity” gave the irrigation agency a great deal of

power and influence over policy making in water management. It was also a lucrative source of funds and projects to reward local voters for their support. Politicians had little incentive to get involved in any reforms that might change the agency's focus on construction. Thus the development of policy for PIM was left to the irrigation agency.

The agency, though, had few clear incentives to develop water user organizations. At first they were seen as a source of cheap labor for projects, but officials soon found that farmers were not amenable to being told what to do with little remuneration. The agency abandoned early groups. Later attempts were made with smaller, on-farm groups, but these received relatively little attention. Most of the resulting water user groups in the country are paper organizations. The lack of political vulnerability combined with a great deal of bureaucratic fusion has left Thailand bereft of the institutional framework necessary for effective participatory irrigation management.

Thus we see the historical process by which institutions either did or did not develop. In Taiwan and the Philippines the presence of these institutions grew out of serious political threats. The KMT was concerned about developing and maintaining food security in the face of threats from the mainland. In the Philippines, Marcos had watched his predecessors fall due to rice price fluctuations, and he was determined to ensure a stable rice supply and price to legitimate his rule. Neither was forced to face battles with their irrigation agencies over policy reforms, and both engaged in changes that pushed for greater participatory management of irrigation resources. In contrast, both Indonesia and Thailand housed influential irrigation agencies. When vulnerability threatened in Indonesia, politicians briefly gained the upper hand over bureaucrats, but this momentary

aberration quickly faded as bureaucrats re-entered the policy arena, reshaping it to fit their interests. Thailand never experienced much pressure for institution-building, and the RID has always been influential enough to avoid major reforms.

These causal tales provide support for my argument that political vulnerability is the main mover behind institution-building and that bureaucratic fusion can block it. My sub-national cases, though, indicate that the local context in which street-level bureaucrats engage with farmer groups is more nuanced.

In Indonesia, where bureaucratic fusion was not strong at the district level, I observed variation among districts according to the degree of political pressure district politicians felt regarding agricultural production. In Kulon Progo, the district chief was well aware of farmer needs, and he felt electorally bound to direct civil servants to be responsive to farmer needs. This contributed to the focus of irrigation and agriculture officials on water user organization development, which in turn resulted in relatively stronger groups. In both Bantul and Sleman, district leaders felt little vulnerability in issues related to irrigation, and they put their focus on more urban pursuits such as industry and education sector promotion.

Even so, I found cases of success in both of those districts. In Bantul, the tireless efforts of a local farmer leader brought his water user organization into national prominence as an example of success. In Sleman, district irrigation officials, responding to staffing shortages, developed a training program to encourage greater involvement of farmers in the operations and maintenance of irrigation systems. These cases indicate that although political vulnerability may be sufficient to encourage the development of

institutions for participatory irrigation management, it may not be necessary. There are other causal pathways to the development of water user groups.

Thailand offered an interesting opportunity to test the strength of bureaucratic fusion. As the irrigation agency is very centralized, local politicians have very little control over local irrigation officials. While they may cooperate with officials, they do not have the authority to compel them to respond to local pressures. Theoretically, then, I would expect that the major determinant of the strength of water user groups comes from either the officials or the farmers themselves.

As I visited a number of water user organizations throughout the country, I found that multiple paths led to more successful water user groups. Perhaps the most important determinant was the attitude of the local irrigation agency officials; in cases where the irrigation officials were supportive of water user groups and focused on their promotion, I found a much greater level of success. In cases where local officials were not interested in working with water user groups, success was very rare.

The causes of a local officials' interest in water user groups were varied. In one case, the official was inspired by farmer activity to begin learning more about public administration. In another, the official was a native of the area and he had relatives who were farmers. Officials were also aware of staffing limits within the agency, which provided some pressure for better cooperation with farmers. This, though, was experienced in both successful and unsuccessful cases. None of the successful cases I studied appeared to be driven solely by political vulnerability.

Bringing the subnational comparisons for both Thailand and Indonesia together,

we can see that although local political vulnerability did seem to have some effect, and may have been sufficient for the promotion of water user organizations, it is not the only causal path available. Indeed, it appears that a number of alternative causal chains may result in the development of local institutions for water resource management.

While political vulnerability of local politicians did seem to matter in Kulon Progo, Indonesia, other areas did not experience the same vulnerability. In Sleman, Indonesia, a staffing shortage seemed to be the primary motivator, while in Bantul, Indonesia, the personal effect of a farm leader mattered. In Mae Yom, Thailand we saw the personal connections between farmers and a civil servant as the primary motivators behind a successful group. In the P4 Water Management Committee Thailand, an active group of farmers who banded together independent of the irrigation agency were able to develop their group. Finally in Krasiew, Thailand, a dedicated set of irrigation employees facing staffing shortages humbled themselves to work with farmers.

Using my sub-national case studies and taking the data presented in Table 4.3 and Table 5.3, I construct a simplified truth table based on the Qualitative Comparative Analysis technique developed by Charles Ragin.[3] This combined data is found in Table 6.1. Using this data, we can further construct simplifications of the causal chains that led to successful WUO in both Indonesia and Thailand, found in Table 6.2. In each of the lines, lower-case lettering indicates the absence of a condition, while upper-case lettering indicates the presence of the condition. Ragin suggests using Boolean algebra to simplify the causal chains, but in my cases there are no simplifications to be made. We are left with seven distinct causal paths to successful water user organizations.

3 See Ragin 1987; 1994.

Table 6.1: Truth Table for Data on Success in WUO in Thailand and Indonesia

	Local BF*	Local PV*	Supportive Local Politician	Supportive Local Official	External Pressure for PIM	Obvious Benefit to Farmers	Water Resource Shortages	Independent Organized Farmers	Success*	Number of groups
1	1	0	0	1	0	1	1	1	1	1
2	1	1	1	1	0	1	1	1	1	2
3	1	0	0	0	0	1	0	0	1	1
4	1	0	0	0	0	0	0	0	0	1
5	1	0	0	1	1	1	0	0	1	1
6	1	1	0	0	1	0	0	0	0	1
7	1	0	0	0	1	0	1	1	0	1
8	1	0	0	0	0	0	1	0	0	1
9	0	0	1	0	1	1	1	1	1	1
10	0	0	0	0	0	0	1	0	0	1
11	0	1	1	1	1	1	1	0	1	2
12	0	0	0	1	0	1	0	1	1	1
13	0	0	0	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	1

* For brevity's sake, I use BF for bureaucratic fusion, PV for political vulnerability
** Success here includes both the high and medium categories

Table 6.2: Causal Configurations from Truth Table	
Successful Groups	
Row 1	BF*pv*politician*OFFICIAL*external*BENEFIT*SHORTAGE*FO
Row 2	BF*PV*POLITICIAN*OFFICIAL*external*BENEFIT*SHORTAGE*FO
Row 3	BF*pv*politician*official*external*BENEFIT*shortage*fo
Row 5	BF*pv*politician*OFFICIAL*EXTERNAL*BENEFIT*shortage*fo
Row 9	bf*pv*POLITICIAN*official*EXTERNAL*BENEFIT*SHORTAGE*FO
Row 11	bf*PV*POLITICIAN*OFFICIAL*EXTERNAL*BENEFIT*SHORTAGE*fo
Row 12	bf*pv*politician*OFFICIAL*external*BENEFIT*shortage*FO
BF = Bureaucratic Fusion PV = Political Vulnerability FO = Independent Farmer Organization	

Theoretically what can these varied paths tell us? The truth tables alone only demonstrate that, under conditions of a weak policy framework for PIM, there are many causal paths to a successful WUO. Further information can be garnered by paying attention to specifics from my cases.

First, the informal links between farmers and political leaders in Kulon Progo were very important, as were the informal links between farmers and irrigation officials in Mae Yom. Such informal links were vital to facilitating the relationship between officials and farmers and reducing the professional distance between them. In Kulon Progo this operated partly through the rotating credit society that the wife of the district chief attended, which happened to be the same group that a farmer leader's wife attended. It also operated through friendships and village relationships. In Mae Yom, the local irrigation official was a native of the area, and he had relatives and friends who were farmers. Farmers felt comfortable approaching him about their problems, and he received

their complaints well. Such relationships could be termed social capital, thus linking this evidence to a broad literature.[4] Thus social capital may be one of the mechanisms through which farmers are able to pressure officials to develop water user organizations to co-manage their resources.

Second, resource shortages for local bureaucratic offices were a common complaint throughout all my fieldwork sites. In some cases, such shortages encouraged officials to rely more heavily on farmers. In Sleman it motivated irrigation officials to develop a training program that empowered water user groups. In Krasiew, officials realized that they would not be able to accomplish their work without developing better relationships with farmers. In both cases, the repeated efforts of street-level bureaucrats to develop water user organizations were rewarded as water user groups in their areas became active in the groups and shouldered the burden of operating and maintaining the local irrigation system. Limited resources, another type of vulnerability,[5] can have a positive effect on institutional development, but they alone are not sufficient to encourage street-level bureaucrats to collaborate with farmers.

Finally, there is something to be said for individual farmers or farmer leaders who develop groups on their own almost independent of the state. In Bantul, Indonesia and in the P4 Water Management Committee in Northeast Thailand, farmers independently have organized and found ways to manage their own resource issues. A growing literature, largely based on the work of Elinor Ostrom,[6] recognizes that human groups do not necessarily need the hand of the leviathan to manage resource distribution. In fact, these

4 See Putnam 1993; Narayan and Pritchett 1999; Fukuyama 2002. See also the World Bank's slightly dated annotated bibliography on social capital, Feldman and Assaf 1999.
5 I discuss this in greater detail below.
6 Ostrom 1990.

indigenous groups are often much more effective and efficacious than their counterparts developed by state actors.

These alternate causal pathways, social capital, resource shortages, and indigenous groups, are all legitimate ways to reach an institution for management of a common pool resource. What is striking, though, is their sporadic nature. When a state apparatus does not answer the needs of the people, an informal method may arise for the establishment of organizations or rules for management of a resource. Working inductively, it seems that perhaps there is no elegant theoretical explanation that can encapsulate all of the successes and failures observed in the field.

Instead, I believe that the take-away points may be less useful as support for my theory of political vulnerability but more useful for policy recommendations. We see that one of the major determinants of successful institutions for irrigation management is the role of the street-level bureaucrat.[7] When a street-level bureaucrat is dedicated to participatory work, he or she will encourage, educate, and empower water users to manage their own irrigation systems. This requires starting with a large time investment, as meetings and training in the field being fairly intensive. After the initial investment, though, eventual returns are impressive. With farmers operating and maintaining systems themselves, the work of officials becomes easier and the cost of maintaining the system decreases. Unfortunately, these benefits are not immediately visible, and extending the life of an irrigation system through good management is a benefit that is hard to capitalize on for any official.

---

7 This has some similarities to the argument put forth that the institutional capacity of a state, to a large degree, is determined by the actions of street-level bureaucrats. See Migdal 1988.

Thus, as noted in the nation-level analysis, the policy framework that surrounds water user organizations is vital to their survival. Without changes to the incentive structure of street-level bureaucrats, we can expect nothing better than sporadic pockets of participatory success. Incentives must be in developed for officials to cooperate with farmers. Monitoring mechanisms must be found that will encourage officials to give ear to farmer concerns, such as those experienced in Taiwan when officials were evaluated, in part, based upon the punctuality of irrigation fee payment. Such bureaucratic incentives are vital to the development of farmer-agency collaboration. I return to this issue below when I consider additional lessons.

The empirical evidence summarized above has some serious implications for our theoretical understanding of how and why institutions emerge. It should also cause us to consider the utility of the theory presented in the second chapter based on the concepts of political vulnerability and bureaucratic fusion.

Political Vulnerability and Bureaucratic Fusion

After reflecting upon the empirical evidence, we can re-evaluate the utility of the concepts upon which my theory is based. Here I discuss political vulnerability as a type of vulnerability. I then discuss the interaction between political vulnerability and bureaucratic fusion. I also point to the importance of a sustained threat for the development and maintenance of institutional capacity. I finally consider the somewhat ambiguous role of the bureaucracy in policy making before weighing the contribution of political vulnerability and bureaucratic fusion as concepts.

First, I have shown that political vulnerability can be a powerful motivator for

policy action and institution-building. Even so, it is useful to think about political vulnerability as only one type of vulnerability. Systemic vulnerability, as identified by Doner, Ritchie, and Slater, has been shown to lead to developmental states.[8] Political vulnerability does not achieve such lofty goals, but it does encourage politicians to engage in some institutional development at a sectoral level. In the case of the Philippines, which is not considered a developmental success by any measure, political vulnerability led to unexpected achievements in the irrigation sector. This included the development of arrangements for farmer-agency co-management of irrigation in some areas. In the Kulon Progo district in Indonesia, electoral and social pressures placed on district leaders by farmers led to the development of strong water user groups. Thus political vulnerability can encourage either a geographic or sectoral benefit while not necessarily encouraging institutional development in other areas.

We also saw in Taiwan the combined effect of systemic vulnerability and political vulnerability. While the country's systemic vulnerability encouraged institutional capacity across the country, the specific feeling of political vulnerability in food security caused the KMT government to spend time and resources in developing irrigation associations for farmer-agency co-management of irrigation.

Does this mean that political vulnerability is a diminished sub-type of systemic vulnerability? Such a claim does have some merit. While systemic vulnerability has far-reaching effect on the state, political vulnerability is more specific. Even so, there are some important distinctions. Politicians experiencing political vulnerability know where and where not to direct their efforts, as the pressure is unique to a certain sector or region.

8 Doner, Ritchie, and Slater 2005.

Politicians experiencing systemic vulnerability must develop institutional capacity for almost every part of the state.[9] This, as we see in Taiwan, does not mean that systemic vulnerability precludes the presence of political vulnerability in certain sectors. In fact, systemic vulnerability may be thought of as an aggregate of political vulnerability in all issue areas rather than in a few instances.

It is also useful to acknowledge a third type of vulnerability, which I do not develop in this dissertation: the vulnerability of bureaucrats to the society around them. Peter Evans referred to something akin to this as "embeddedness," in which bureaucrats maintain links with private actors, thus encouraging the bureaucracy to act in ways beneficial for both.[10] In the cases discussed in previous chapters, resource shortages as well as social links that bureaucrats maintained with farmers had a strong effect on their incentives to be responsive to farmer wishes. These resource limits also encouraged leaders in Sleman district in Indonesia and the Krasiew project in Thailand to emphasize water user groups as a solution to staffing shortages.[11] Such pressures, or vulnerability, placed on bureaucratic officials seem to be an alternative path to institutions for participatory irrigation management. Even so, while resource pressures placed on some bureaucrats may have some effect, my research provides ample examples where these resource limits did not result in any innovative actions taken by officials. Thus this type of bureaucratic vulnerability does not have a deterministic relationship with institution-building.

Second, when we consider the interplay between political vulnerability and

9 See Doner, Ritchie, and Slater 2005.
10 Evans 1995.
11 See also Ricks & Arif 2012.

bureaucratic fusion, we should seek to consider the relative effect of the forces, i.e. which one is stronger. Here the Indonesian case is most useful. When the Asian Financial Crisis struck Indonesia in 1997, the country faced a major threat. Suharto fell, the country decentralized, and the state could barely afford to pay its bills. At this point the World Bank, among others, stepped in with offers of assistance. Some of these offers were conditioned on policy reforms, especially in irrigation. The poor financial state of the country handed the World Bank and other international donors an extremely powerful bargaining position. International donor agencies were able to provide a credible threat that if they withdrew their support, politicians would lose their political offices.

At this point, Indonesian politicians were able to override the interests of the traditionally powerful bureaucratic agencies in policy making. The Ministry of Public Works was disbanded, and reforms in irrigation management moved forward. It seemed that under extreme conditions of political vulnerability, bureaucratic influence over policy could be overcome.

Of course within only a few short years, the bureaucracies were able to navigate their way back into policy control as the 2004 Water Law was being drafted. At that point the Indonesian economy had recovered well enough that politicians no longer felt vulnerable in the face of World Bank threats.

In contrast, we don't see any evidence that political vulnerability in irrigation was ever sufficient to overcome the bureaucratic fusion experienced in Thailand. Even at the sub-national level, efforts to engage in institutional development were not born of political vulnerability.

The evidence from Indonesia indicates, at least anecdotally, that a high degree of political vulnerability can overcome the block on policy reform engendered by a politically strong bureaucratic agency, which brings us to the next issue.

Third, the evidence presented here also causes us to consider the length of time that a politician must feel vulnerable to engage in real institution-building. Again, returning to the Indonesian example, when political vulnerability led the Wahid administration to reform the Ministry of Public Works, it seemed that the reforms were bound to take hold. As the Indonesian economy recovered and the presidency shifted to the hands of Megawati, vulnerability diminished and the reforms were reversed. Also, considering the development of Joint Management Committees in Thailand, the length of time the government was forced to move toward PIM mattered. Initially five projects were begun, which included plans for PIM promotion and the establishment of JMC. As the Asia Development Bank's leverage on the government vanished due to economic recovery, so did the plans for PIM.[12] During an interview, the Advisor to Thailand's Minister of Agriculture and Cooperatives, explained it this way, "If there is no crisis, then the policy moves won't happen. It it isn't an immediate threat, then [the government] won't feel like it is an issue for today... if the crisis isn't long enough the policy passes and doesn't get changed."[13]

Zhu, arguing along similar lines, stated that an "extremely intensive and long-term threat" was vital to the creation of institutional capacity for developmental states in

12 It is important to note here that the actions taken by the Thai government did not amount to real reforms. The political vulnerability of Thai politicians was never as high as that of Indonesian politicians, and the Thais made no serious efforts to reform the irrigation agency. See Abonyi 2005.

13 Interview, Advisor to the Minister of Agriculture and Cooperatives, Bangkok, February 14, 2012.

Taiwan and South Korea.[14] He went on to argue that as such threats disappear, the developmental states falter. This seems to have occurred in the case of Taiwan's Irrigation Associations as well as the National Irrigation Administration in the Philippines. When pressures on politicians changed from a focus on food security, the institutions developed for co-management of irrigation were dismantled by politicians seeking electoral gains. Thus it appears that sustained political vulnerability is necessary.

Finally, the evidence presented in this dissertation points to an interesting, if ambiguous role, played by bureaucratic fusion. In both the Taiwan and Philippines cases, as well as the sub-national cases considered in Indonesia, the relatively subservient role of the bureaucracy allowed politicians to develop policy and bureaucratic rules for the implementation of PIM and the creation of water user organizations free of the kind of bureaucratic interference seen in Thailand at both the national and sub-national levels and in Indonesia at the national level. One might draw the lesson that bureaucratic fusion is always a negative when working on developmental tasks, but this is not necessarily true. The Philippines has rarely experienced developmental success, due in part to the weakness of the bureaucracy. Bureaucratic subservience to both politicians and private actors has allowed for oligarchic dominance of the banking industry,[15] the decimation of the sugar industry,[16] and the control of "bosses" over state officials,[17] not to mention very poor economic performance. In comparison, the Thai state, characterized by an insulated bureaucracy has been much more successful at diversification, promoting foreign investment, as well as encouraging manufacturing in selected sectors, such as automotive

14 Zhu 2002, 5.
15 Hutchcroft 1998;
16 See Billig 2003; Doner 2009.
17 Sidel 1999.

and electronics. This has not necessarily led to upgrading[18] or the capacity to sustain growth,[19] but it has left Thailand and the Thai people in a much better economic position than their Philippine counterparts. Thus, a bureaucracy with strong policy influence is not necessarily detrimental to development.[20] Even so, when the issue of reform is the question, bureaucratic fusion can certainly hamstring the efforts of policy makers.

In conclusion, from the evidence presented in the previous chapters, I believe that political vulnerability and bureaucratic fusion provide a degree of theoretical leverage in explaining the conditions under which a state engages in institutional development. Political vulnerability does appear to motivate policy makers to act in ways that would be against their initial interest structure. It is a distinct concept from systemic vulnerability, although it may be a diminished sub-type. Future work with the concept could benefit from a more deliberate typology classifying the different types of vulnerabilities that policy actors, both politicians and bureaucrats, face in the policy-making and implementing process.

Bureaucratic fusion also provides utility when considering the role of bureaucracies in the policy-making and implementing process. Political scientists need to be more aware of the influence of top-level bureaucrats as policy is developed. Bureaucratic agencies have their own incentives to promote, and they do not passively wait until legislation is passed before they engage in protecting their own interests. When agencies are able to engage in the policy-writing process, either through formal or informal means, they shape the outcome, blurring the distinction between principals and

18 Doner 2009.
19 Rock 2000; see also Rodrik 2007.
20 This point is well-developed by Evans 1995.

agents. This area is under-theorized,[21] and my research into the role of bureaucratic fusion in the creation and implementation of PIM policies has the potential for application in other settings and greater theoretical development.

Additional Lessons

While the results of my research have provided some answers in relation to my theory and hypotheses, the evidence has also indicated a number of other issues which my theory does not adequately explain. One of the benefits of case study research is that it provides the opportunity to identify missing variables from our theories and for parsing out causal complexity.[22] The cases presented here bring up three major additional points which merit further, albeit brief, consideration.

First, the nation-level comparisons outlined in Chapter Three pointed to two successful cases wherein Taiwan and the Philippines were, at certain points in their history, able to develop the policy framework necessary to encourage water user organizations for farmer-agency collaboration in the management of irrigation resources. It is important to note that in both cases, the institutional reforms were adopted during authoritarian eras and after the transition away from authoritarianism the two states also moved away from the promotion of WUO and co-management of irrigation resources. This may be more than a coincidence.

Social scientists have long debated the benefits of democracy over dictatorship. Scholars have shown that democracy does not necessarily hinder economic growth, thus democracy need not be sacrificed in order to achieve development.[23] In fact scholars have

21 Moe 2006.
22 Gerring 2007; George and Bennett 2005.
23 Przeworski et al. 2000.

shown that democracies are more likely to provide public goods such as public health and education than their authoritarian counterparts.[24] Thus, through investment in human capital, democracies are able to promote economic growth, albeit through an indirect path.

On the other hand, Samuel Huntington infamously declared that regime type did not matter as much as the strength of the government in the search for development.[25] In fact, a dictatorial regime may be beneficial in some cases. Others have argued that the difference in time horizons between democrats and autocrats matter. Thus a "stable bandit" acting with long time horizons would cultivate long-term economic growth and protection of private property due to his or her own self-interest.[26]

While most social scientists would not dispute the normative "good" of democracy, there are indicators that a dictatorship would provide at least some incentives to rulers to engage in developing institutional capacity. In fact, the most touted developmental successes of the late 20th century were authoritarian. My research indicated that dictatorial regimes can have incentives to develop institutions for improved management of water resources. Even so, my alternate cases of Thailand and Indonesia demonstrate that dictatorship itself is not a proximal causal factor for institutional development in the irrigation sector. Taiwan and the Philippines, though, deserve a brief discussion here.

The evidence presented in Taiwan does show that the country experienced a great deal of political vulnerability in food security at the same time it was authoritarian. Later,

24 Lake and Baum 2001; Baum and Lake 2003; Ansell 2008.
25 Huntington 1968.
26 Olson 1993; Clauge et al. 1996; McGuire and Olson 1996.

as those threats diminished,[27] the institutions built to ensure efficient management of water resources throughout the previous decades were allowed to decay. This occurred at the same time period as Chiang Ching-kuo, Chiang Kai-shek's son, began the transition away from dictatorship. While there is some correlation between regime type and the efficacy of water user organizations, the evidence presented does show that the proximal cause of the care taken for irrigation institutions was the concern over food security.

In the Philippines, though, the link between dictatorship and water user organization development requires more explanation. The success of the NIA was closely correlated with the authoritarian regime of Marcos despite the fact that food security concerns were experienced both before and after his regime. Here we need to look deeper at the circumstances that caused Marcos to focus on promoting PIM and the creation of water user organizations as a solution to the problem of food security.

Marcos' legitimacy was based, in large part, on promises for increased agricultural production. Unlike prior governments, he could not rely on the expansion of the land frontier, as it was exhausted by the early 1960s. In fact, by the amount of land under rice production decreased from 3.306 million hectares in 1960 to 3.096 million hectares in 1967.[28] Instead Marcos planned to rely on the increasing yields through expanding the area under irrigation and cultivation of high yield varieties developed by the International Rice Research Institute.[29] During his first term as president, he devoted a great deal of money to irrigation infrastructure projects. As his second term as president began,

27 Zhu 2002.

28 Tadem 1986.

29 Marcos had also hoped that land redistribution would assist in this effort. The land reform program, though, failed to redistribute land to tenant farmers in rice-producing areas. What did help increase rice production was the Masagana 99 Program, a subsidized credit program for farmers. This program, though, required farmers to have access to irrigation. See Tadem 1986.

though, the Philippines experienced a major balance-of-payments crisis, brought on, in part, by Marcos' profligate spending.[30] When the country transitioned to authoritarian rule, the state coffers were relatively bare. As noted in Chapter Three, the president could not spend himself into rice self-suffiency. Thus in 1972 he reformed the National Irrigation Administration to rely more heavily on funds from two sources: (1) farmers and (2) international aid agencies. Both of these sources required a greater reliance on farmer participation as well as the development of water user organizations to facilitate it.

Looking at the circumstances facing Marcos, we can see more clearly that it was not dictatorship that caused the institutional development, although it may have facilitated it. Had the Philippines remained under democratic rule this development may have not been possible due to an increased number of veto players. The counter-factual, though, is uncertain. We do know that Marcos faced political vulnerability in the realm of rice production, and his only recourse was to expand irrigation. He, though, was out of money. Thus he had to rely on institutional development necessary to obtain resources from farmers and international aid agencies.

By the early 1980s corruption in the political system had limited the success of rice production, and Marcos was once again vulnerable. The country transitioned to democracy, and politicians began to engage in pork-barrel spending in the irrigation realm; the pressure on the NIA to work closely with farmers diminished. Despite rice insecurity, politicians now focus on more immediate and tangible promises to garner political support, such as removing water user fees or providing an easily visible infrastructure project for their home district. It seems that democracy, in allocating power

30 Hutchcroft and Rocamora 2003.

among a number of individuals, has also decentralized political vulnerability. Thus the problem of rice production and irrigation management cannot be assigned to a single politician and brought to bear for the promotion of reforms and institutional development.

Of course, these are merely hypotheses. At best we can say that dictatorship may have facilitated political leaders' responses to vulnerability, but it was not a proximate cause.

Second, we see an ambiguous effect from international donors. International aid agencies, like the World Bank and the Asia Development Bank, face barriers in prompting irrigation agency reform and improved governance of water resources. Despite a long history of urging host countries to reform, aid agencies remain significantly constrained in their capacity to elicit change. I found that one potential opening for reform, however, occurred during economic crises. Under these conditions, aid agencies exerted additional influence for policy reform; otherwise their efforts resulted in the adoption of half-hearted reforms, if any. Following the 1997 Asian Financial Crisis, we saw that in Thailand and, to a much greater extent, Indonesia, international donors were able to force institutional changes and reforms on the host countries. In both cases, they had domestic allies that also promoted reform, but it was the threat of withholding aid that caused both Thailand and Indonesia to embark on some degree of irrigation reform. After the countries had recovered sufficiently, though, they both backtracked on reforms. We also saw that in 1987 Indonesia adopted half-hearted reforms for PIM to appease the World Bank.

This reflects some parallels with Girod's argument that “desperate” countries

respond better to the incentives provided by international donors.[31] My research shows that aid agencies can contribute to a feeling of vulnerability and encourage reform, but if the vulnerability is short-lived, the institutional reforms may not take root. Even the World Bank's protests in 2004 and disbanding of the final disbursement of its loan program could not convince Indonesia to continue down the road of reform. On the other hand, the Philippines' long relationship with the World Bank has not encouraged productive reform despite its poor financial state. Indeed, one World Bank official wrote that, "To a substantial degree Bank (and other donor) funds have enabled NIA to avoid facing the need for fundamental reform."[32] Investigating the conditions under which international donors might have more success at encouraging reform could be a promising endeavor and be well-informed by a comparison of the cases presented here.

Finally, my sub-national comparisons identified a number of alternative causal pathways to the creation of water user organizations as outlined above. This is indicative of two major issues that exist outside of my theory. First, individual incentives outside of the official institutional framework matter. Neither Indonesia or Thailand had a national policy framework to encourage irrigation officials to develop effective water user organizations. Instead most bureaucratic incentives were based on infrastructure construction and rehabilitation projects. What incentives did exist for creating water user organizations focused primarily on quantity rather than quality.[33] Local offices in both countries were evaluated on the number of new water user organizations established,

31 Girod 2012.
32 Briscoe 2000, 2.
33 One official in Thailand complained of rush to set up water user organizations without any attention paid to the needs of the farmers in the area. He rattled off the number of new organizations and then said, "it's absurd!" (*mua loei*). Interview, RID Official, Bangkok, February 7, 2012.

regardless of whether the farmers whose names appeared on the paperwork were active in their organizations or if they even wanted or needed the group. With such a policy framework, it should not be surprising that few successful cases emerged.

Even so, I found time and time again that some bureaucrats cared about participation. During an interview, the official who had spearheaded many efforts to incorporate more participation for farmers in the Royal Irrigation Department of Thailand summarized his own interest in participatory methods with a grin, "The short answer is that I love it."[34] One of his colleagues explained more in depth the sacrifice made by those who focus on participatory work:[35]

> Look at me, I first was in the mapping office, then moved to the OPPP, and now I am here working at the Irrigation College, but I have never been promoted in the civil service. I am still at the same pay-grade. That is because top officials are not interested in my work. They don't care about working with farmers, so there is no reward for doing it. Working with farmers will not get you promoted. If you work with projects that the big guys are interested in, you can get promoted fast. Working with farmers isn't that kind of work. But I like it.

Others in the Thai civil service also expressed enjoyment in working with farmers. These officials, who acted against their narrowly-defined self interest by working with farmers, [36] were vital to the success of some of the water user organizations I visited. These officials sacrificed time, money, and promotion potential to encourage the development

34 In Thai: "*Khamtob san san kheu jai rak.*" Interview, RID Official, Bangkok, March 20, 2012.
35 Interview, RID Official, Bangkok, March 20, 2012.
36 Some might even say that these were not rational actors. In fact, another official I interviewed asserted repeatedly that working with farmers would harm his career prospects as it took time away from his official duties. Interview, RID Official, Nakhorn SriThammarat Province, June 5, 2012.

of water user groups.

This was also true of officials in Indonesia. As I attended farmer meetings in villages in the Sleman district, I was repeatedly surprised to bump into the official who developed the water user group training program for the district. Despite the fact that he has been transferred to another office and had no further responsibility over water user groups, he continued to attend meetings, make presentations, and teach farmers of the benefits they could gain from actively pursuing a water user group.[37] In another case, a now-retired official interested in farmer welfare spent a great deal of time and effort talking with farmers, building trust between them and the agency, and laying the groundwork for farmer-agency collaboration.[38] Despite a lack of official incentives, these officials were driven by their own mindfulness for farmer welfare and participatory work.

Individually-driven results such as these pose a challenge for broad theories. We can dismiss them as anomalies or outliers, but that does not negate the fact that they exist. We could employ a cynical eye, pointing out that this affection expressed for farmers must come from some other source, such as social ties to the community or some deeper utility-maximizing force thereby tying them into our theory through circuitous means. These approaches, although fairly common, miss the fact that human behavior is not always easily described by elegant theories. While the vast majority of irrigation officials do follow the incentive structures given them, a few individuals are willing to bear the extra cost necessary to promote a cause they feel is just. This does not mean we should abandon our theories, but it does mean that we must be aware of the effect of an

37 Interview, PU Official, Yogyakarta, April 7, 2011.
38 Interview, PU Official, Yogyakarta, August 4, 2011.

individual.

Second, the role of these individual actors should also cause us to consider the freedom of movement provided to street-level bureaucrats. In other words, even in a centralized state like Thailand, there is still a great deal of implementation space in which local officials can maneuver, despite extensive laws and policies. Such "policy space" allowed for street-level bureaucrats to promote water user groups, notwithstanding the fact that clearly-defined national policy frameworks for such activities were generally missing.

We might tie this to the literature on street-level bureaucrats, defined largely by the work of Lipsky. He argued that the government officials who engage in day-to-day interaction with service recipients have a great deal of discretion in their jobs. As they implement public policy, they also define it on the ground. In a sense, this means that their actions "become the public policies they carry out."[39] And in many ways, their actions are often outside the realm of accountability. Even so, the policy environment matters. Not all options are open. The entire policy framework determines the universe of bureaucratic action.

In many developing countries, though, this policy framework is broad and monitoring is weak. For example, in Thailand, irrigation policies developed by the RID provide a multitude of opportunities for a civil servant to justify almost any action. Water user fees have legal force thanks to the 1962 Dykes and Ditches Act, yet the general policy is that water is free to farmers. The Government's five year plans have declared the importance of participation since the 1980s, yet there is little-to-no enforcement. Dams

39 Lipsky 2010, *xiii*.

construction is restricted by environmental impact analysis and community involvement, so the government builds "weirs" that have all the characteristics of dams.[40] The multitude of policies and overlapping responsibilities provides a great deal of space wherein street-level bureaucrats have discretion in their individual actions.[41] Coordinating and monitoring is almost impossible.

Street-level officials also have little incentive to implement more effective monitoring of their activities. In Indonesia this was in evidence as irrigation officials protested new water monitoring efforts. During a meeting, one official called out, "if this policy is implemented, my workload will increase!"[42] Researchers involved with the project had little hope that it would be be successful.

Thus street-level bureaucrats' policy discretion plays an important role in policy outputs. With so much discretion at the local level in Thailand and Indonesia, re-shaping street-level bureaucratic behavior for greater interest in participation in a predictable and nation-wide manner would require extensive reforms to the rules governing bureaucratic behavior. Efforts to increase monitoring of such agencies is often problematic. In fact, some research suggests that increasing monitoring may be counterproductive. Each additional rule can create justification for actions which may violate other rules and greater elaboration can create greater confusion for the street-level officials who must

---

40 Visit to That Noi Weir on the Chi River. Personal Communication, RID Official, Ubon Province, April 5, 2012.

41 For example, in Nakhorn Phatom province, Thailand, 9 separate offices within the RID are responsible for water management. Added to that are a number of other ministries with overlapping responsibilities in the region. When asked about how many offices shared responsibility, one presenter responded, "I don't dare count! (*mai kla nab!*)" Panel on Participatory Water Management: Different Experiences from the Field, at Thailand Research Fund Annual Conference, Impact Arena, Muang Thong Thani, Nonthaburi, Thailand. June 21, 2012.

42 "*Kalau ini jalan, tugasku naik*!" Field Notes from Irrigation Meeting, East Java, March 28, 2011.

interpret centralized rules into situational applications. In essence, "more rules may create more discretion."[43] An alternative may be to augment the training of irrigation officials.[44] Including courses on participation in irrigation colleges or developing more intensive training programs may have the desired effect. A more immediate response could be elicited through augmenting the incentives provided to officials. Officials I interviewed often cited their wish for financial and promotional awards for working with farmers.[45] The economist's adage cited at the opening of this dissertation may be the best medicine for ailing participatory policies: "people do what they get paid to do, what they don't get paid to do, they don't do." If street-level bureaucrats received greater rewards for their participatory efforts, they would spend more time and effort on them.

These issues, the effect of regime type, the role of international aid agencies, individual preferences, and street-level bureaucrats' policy discretion, all likely deserve a great deal more consideration than they receive here. Each could spawn a dissertation of their own. The evidence presented above, although geared toward testing a specific theory, also provides potential contributions in each of these realms, but those are projects for another day.

Conclusion

In this dissertation, I have argued that a state's capacity to create institutions to tackle difficult developmental tasks hinges on the incentives of politicians and bureaucrats, both in the central offices and on the street. The evidence presented here shows that these incentives are vital to policy formation and implementation. We see that

43 Evans and Harris 2004, 871.
44 Evans 2011.
45 e.g. Interview, RID Official, Phrae Province, May 24, 2012. Interview, RID Official, Nakhorn SriThammarat, June 5, 2012.

when politicians' incentives shift toward institution-building and top-level bureaucrats are unable to hinder the policy reform process, a state can develop the necessary policy framework for public-private collaboration to accomplish difficult tasks.

On the other hand, when conditions are not right for the emergence of a favorable policy framework, we see that the incentives of street-level bureaucrats primarily determine whether or not the state can develop such institutions. Thus I propose an adjustment to Lipsky's claim that street-level bureaucrats make policy.[46] More appropriately we might say that the incentive structure of street-level bureaucrats determines policy. Those incentives come primarily from the existing policy framework as well as rules for promotion and raises that are established by their managers. Such incentives, though, may also come from the communities in which they live, especially when the nation-wide policy framework is weak.

These findings are interesting theoretically, but perhaps they are more important substantively. Development practitioners have struggled for decades, seeking the right policy framework to overcome hurdles to difficult developmental tasks.[47] As demonstrated above, getting the right policy reforms in place requires a realignment of politicians' incentive structures. This is difficult, and relies on circumstances often outside the control of any of the actors involved, like food security concerns or financial crises. If we rely on such developmental stars aligning, the likelihood that developing countries will embrace the right reforms at the right time is very slim. All this is to say that there is good reason for the rarity of the developmental state.

---

46 Lipsky 2010, especially Chapter 2.
47 Pritchett and Woolcock 2004.

Perhaps more important and more realistic than finding the right policy reform is finding the right incentive structure for street-level bureaucrats who bear some the leading roles in development. Small modifications, such as providing a salary bonus for officials who work with farmers or requiring a course on participation in an engineering curriculum, might provide more benefit for less cost than hoping for the success of major bureaucratic transformations.

Bibliography

Note: Thai authors are listed by first name in accord with Thai convention.

Abel, Martin E. 1975. *Irrigation Systems in Taiwan: Management of a Decentralized Public Enterprise*. St. Paul, MN: Institute of Agriculture, University of Minnesota.

Abonyi, George. 2005. *Policy Reform in Thailand and the Asian Development Bank's Agricultural Sector Program Loan*. Manila, Philippines: Asia Development Bank.

Ammar Siamwalla. 1995. "Land Abundant Agricultural Growth and Some of Its Consequences: Thailand." in *Agriculture on the Road to Industrialization*, ed. John W. Mellor, 150-174. Baltimore, MD: Johns Hopkins University Press.

———. 2001. *The Evolving Roles of State, Private, and Local Actors in Rural Asia.* New York: Oxford University Press.

Amsden, Alice. 2001. *The Rise of "The Rest": Challenges to the West from Late-Industrializing Economies.* New York: Oxford University Press.

Ansell, Ben W. 2008. "Traders, Teachers, and Tyrants: Democracy, Globalization, and Public Investment in Education." *International Organization* 62 (2): 289-322.

Araral, Eduardo. 2005. "Bureaucratic Incentives, Path Dependence, and Foreign Aid: An Empirical Institutional Analysis of Irrigation in the Philippines." *Policy Sciences* 38: 131-157

———. 2006. "Decentralization Puzzles: A Political Economy Analysis of Irrigation Reform in the Philippines." PhD diss., Indiana University.

Arif, Sigit S. 2009. “Mengembalikan Irigasi untuk Kepentingan Rakyat (Returning Irrigation for the Benefit of the People).” Lecture given at Gadjah Mada University before the Council of Professors, Yogyakarta, Indonesia, May 25..

Arnold, R. Douglas. 1987. “Political Control of Administrative Officials.” *Journal of Law, Economics, & Organization* 3 (2): 279-286.

Asia Development Bank. 2003a. “Report and Recommendation to the Board of Directors on Proposed Loans to the Republic of Indonesia for the Participatory Irrigation Sector Project.” Manilla, Philippines: Asia Development Bank.

———. 2003b. “Program Completion Report on the Agriculture Sector Program in Thailand.” Manilla, the Philippines: Asia Development Bank.

Asian Productivity Organization. 1998. *Report of the APO Seminar on Irrigation Association for Participatory Management held in Lahore from 6 to 11 October, 1997*. Tokyo: Asia Productivity Organization.

Bagadion, Benjamin. 1989. "The Evolution of the Policy Context." In *Transforming a Bureaucracy: The Experience of the Philippine National Irrigation Administration*, ed. Francis F. Korten and Robert Y. Siy, 1-19. West Hartford, CT: Kumarian Publishers.

Bagwell, Kyle and Robert W. Staiger. 2002. “Economic Theory and the Interpretation of GATT/WTO.” *The American Economist* 46 (2): 3-19.

BAPPEDA, Sleman. 2005. *Sleman Regency in Figures 2005.* Sleman, Indonesia:

BAPPEDA Sleman.

BAPPEDA, Bantul. 2011. *Sekilas Kabupaten Bantul (Bantul District at a Glance)*. Bantul, Indonesia: BAPPEDA Bantul.

Bardhan, Pranab. 2000. “Understanding Underdevelopment: Challenges for Institutional Economics from the Point of View of Poor Countries.” *Journal of Institutional and Theoretical Economics.* 156(1): 216-235.

———. 2002. “Decentralization of Governance and Development.” *Journal of Economic Perspectives* 16(4): 185-205.

Bates, Robert H. 1981. *Markets and States in Tropical Africa*. Berkeley, CA: University of California Press

Batley, Richard and George A. Larbi. 2006. "Capacity to Deliver? Management, Institutions, and Public Services in Developing Countries." In *Public Sector Reform in Developing Countries: Capacity Challenges to Improve Services* ed. Yusuf Bangura and George A. Larbi, 99-130. London: Palgrave Macmillan Publishing.

Baum, Matthew and David Lake. 2003. “The Political Economy of Growth: Democracy and Human Capital.” *American Journal of Political Science* 47(2): 333-347.

Bidhya Bowornwathana. 2001. “Thailand Bureaucracy Under Coalition Governments.” in *Civil Service Systems in Asia*, eds John P. Burns and Bidhya Bowornwathana, 281-321. Northampton, MA: Edward Elgar.

———.2005. “Administrative Reform and Tidal Waves from Regime Shifts: Tsunamis in Thailand's Political and Administrative History.” *The Asia Pacific Journal of*

Public Administration 27(1): 37-52.

———. 2010. “Bureaucrats, Politicians, and the Transfer of Administration Reform into Thailand.” in *Comparative Administrative Change and Reform,* eds. Jon Pierre and Patricia W. Ingraham, 207-232. Quebec: McGill-Queen's University Press.

———. 2011. “History and the Political Context of Public Administration in Thailand.” in *Public Administration in Southeast Asia*, ed. Evan M. Berman, 29-52. Boca Raton, FL: CRC Press.

Billig, Michael S. 2003. *Barons, Brokers, and Buyers: The Institutions and Cultures of Philippine Sugar.* Honolulu, HI: University of Hawai'i Press.

Boix, Carles and Milan Svolik. 2011. "The Foundations of Limited Authoritarian Government: Institutions and Power-Sharing in Dictatorships." Unpublished manuscript: Princeton University.

Booth, Anne. 1999. “Initial Conditions and Miraculous Growth: Why is South East Asia Different From Taiwan and South Korea?” *World Development* 27(2): 301-321.

Bosco, Joseph. 1992. “Taiwan Factions: Guanxi, Patronage, and the State in Local Politics.” *Ethnology* 31(2): 157-183.

Bottral, A. F. 1977. “Evolution of Irrigation Associations in Taiwan.” *Agricultural Administration* 4: 245-250.

Bresnan, John, ed. 2005. *Indonesia: The Great Transition.* Lanham, MD: Rowman & Littlefield Publishers.

Briscoe, John. 2000. “The World Bank's Role in Water Resource Management in the Philippines: Results of a Consultation.” World Bank Office Memorandum, April

28.

Brummelhuis, Han Ten. 2005. *King of the Waters: Homman van der Heide and the Origins of Modern Irrigation in Siam.* Leiden, the Netherlands: KITLV Press.

Bruns, Bryan R. 1991. “The Stream the Tiger Leaped: A Study of Intervention and Innovation in Small Scale Irrigation Development in Northeast Thailand.” PhD diss, Cornell University.

———. 2004. "From Voice to Empowerment: Rerouting Irrigation Reform in Indonesia,” In *The Politics of Irrigation Reform: Contested Policy Formulation and Implementation in Asia, Africa, and Latin America*, ed. Peter P. Mollinga and Alex Bolding, 145-165. Burlington, VT: Ashgate Publishing.

———. 2008. “Aiding Adaptive Co-management in Irrigation.” Prepared for the 12th Biennial Global Conference of International Association for the Study of the Commons. Cheltenham, England, July 14-18.

Buehler, Michael. 2010. “Countries at the Crossroads 2010: Indonesia.” Washington, DC: Freedom House. http://www.freedomhouse.org/report/countries-crossroads/2010/indonesia.

———. 2012. “Countries at the Crossroads 2012: Indonesia.” Washington, DC: Freedom House. http://www.freedomhouse.org/report/countries-crossroads/2012/indonesia.

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M. Siverson, and James D. Morrow. 2003. *The Logic of Political Survival*. Cambridge, MA: MIT Press.

Bureau of the Budget 2011. *Thailand's Budget in Brief: Fiscal Year 2011.* Bangkok:

Bureau of the Budget.

Burns, John P. and Bidhya Bowornwathana. 2001. "Asian Civil Service Systems in Comparative Perspective." in *Civil Service Systems in Asia*, eds. John P. Burns and Bidhya Bowornwathana, 1-23. Northampton, MA: Edward Elgar Publishers.

Careaga, Maite and Barry Weingast. 2003. "Fiscal Federalism, Good Governance, and Economic Growth in Mexico." in *In Search of Prosperity*, ed Dani Rodrik, 399-435. Princeton: Princeton University Press.

Carino, Ledivina V. 1989. *A Dominated Bureaucracy: An Analysis of the Formulation of, and Reaction to, State Policies in the Philippine Civil Service*. Manila, Philippines: University of the Philippines

———. 1992. *Bureaucracy for Democracy: The Dynamics of Executive-Bureaucracy Interaction During Governmental Transitions*. Manila, Philippines: University of the Philippines.

Chai-Anan Samudavanija. 1997. "Old Soldiers Never Die, They are Just Bypassed: The Military, Bureaucracy, and Globalization." in *Political Change in Thailand: Democracy and Participation,* ed. Kevin Hewison. Pp. 42-57. New York: Routledge.

Chaiyuth Sukhsri. 1999. "Water Resources Law in Thailand." Unpublished memo prepared for Japan International Cooperation Agency. Chulalongkorn University: Bangkok, Thailand.

Charin Atthayodhin. 1968. "Efficient Management, Operation and Maintenance of Projects under Control of the Royal Irrigation Department." from Proceedings of

the 8th Session of the Regional Conference on Water Resources Development in Asia and the Far East, held in Bangkok, Thailand, November 18-25.

Christensen, Scott R. 1994. "Water Allocation Conflicts in Thailand: An Analysis of Government Failure." in *Water Conflicts,* 2nd ed, 53-86. Bangkok: Thailand Development Research Institute.

Christensen, Scott R. and Ammar Siamwalla. 1993. "Beyond Patronage: Tasks for the Thai State." Prepared for the 1993 TDRI Year End Conference, "Who Gets What and How? Challenges for the Future," Ambassador City Jomtien, Chonburi, Thailand, Dec 10-11.

Christensen, Scott R. and Areeya Boon-long. 1994. "Institutional Problems in Thai Water Management." Working Paper. Bangkok: Thailand Development Research Institute.

Clauge, Christopher, Philip Keefer, Stephen Knack, and Mancur Olson. 1996. "Property and Contract Rights in Autocracies and Democracies." *Journal of Economic Growth* 1(June): 243-276.

Dayrit, Hector. 2001. "The Philippines: Formulation of a National Water Vision." in *From Vision to Action: A Synthesis of Experiences in Southeast Asia*, eds Le Huu Ti and Thierry Facon, 43-70. The FAO-ESCAP Pilot Project on National Water Visions. Bangkok, Thailand.

De los Reyes, Romana and Sylvia Ma. G. Jopillo. 1986. *An Evaluation of the Philippine Participatory Communal Irrigation Program.* Institute of Philippine Culture Report. Quezon City, Philippines: Ateneo de Manila University.

De los Reyes, Romana and Sylvia Ma. G. Jopillo 1989. “The Impact of Participation: An Evaluation of the NIA's Communal Irrigation Program.” in *Transforming a Bureaucracy: The Experience of the Philippine National Irrigation Administration*, eds. Frances F. Korten and Robert Y. Siy, 90-116. West Hartford, CT: Kumarian Press.

Department of Irrigation and Engineering. No Date. *History of Irrigation in Taiwan*. http://doie.coa.gov.tw/english/about-history-part1.asp.

Desch, Michael C. 1996. “War and Strong States, Peace and Weak States?” *International Organization* 50(2): 237-268.

Diamond, Jared and James A. Robinson, eds. 2010. *Natural Experiments of History*. Cambridge, MA: Harvard University Press.

Diamond, Larry. 1999. *Developing Democracy: Toward Consolidation*. Baltimore, MD: Johns Hopkins University Press.

Dixit, Avinash K. 1996. *The Making of Economic Policy: A Transaction-Cost Politics Perspective*. Cambridge, MA: MIT Press

Doner, Richard F. 2009. *The Politics of Uneven Development: Thailand's Economic Growth in Comparative Perspective*. Cambridge: Cambridge University Press.

Doner, Richard F., Bryan Ritchie, and Dan Slater. 2005. “Systemic Vulnerability and the Origins of Developmental States: Northeast and Southeast Asia in Comparative Perspecitve.” *International Organization* 59: 327-361.

Doner, Richard F. and Ben Ross Schneider. 2000. “Business Associations and Economic Development: Why Some Associations Contribute More Than Others.” *Business*

and Politics 2 (3): 261-288.

Doronila, Amando. 1985. “The Transformation of Patron-Client Relations and Its Political Consequences in Postwar Philippines.” *Journal of Southeast Asian Studies* 16(1): 99-116.

Duncan, S. 1976. "Local Irrigators' Groups: Assessment of their Operations and Maintenance." In *Irrigation Policy and the Management of Irrigation Systems in Southeast Asia*, ed. Donald C. Taylor and Thomas H. Wickham, 185-191. Bangkok, Thailand: The Agriculture Development Council

Easterly, William. 2001. *The Elusive Quest for Growth*. Cambridge, MA: The MIT Press.

Eleazar, Luis P., Jose A. Galvez, Verda Imperial Saw, Roger C. Lazaro, and Alfred Waldstein. 2005. “Participatory Approaches to Irrigation Development and Management in the Philippines: The Next Generation.” in *Asian Irrigation Systems in Transition: Responding to Challenges Ahead*, eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 291-309. Thousand Oaks: Sage Publications.

Endriga, Jose N. 2001. "The National Civil Service System of the Philippines." In *Civil Service Systems in Asia*, ed. John P. Burns and Bidhya Bowornwathana, 212-248. Northampton, MA: Edward Elgar Publishing

Ertsen, Maurits. 2006. “Colonial Irrigation: Myths of Emptiness.” *Landscape Research* 31(2): 147-167.

Evans, Peter. 1995. *Embedded Autonomy: States and Industrial Tranformation.* Princeton: Princeton University Press.

———. 1996. “Government Action, Social Capital, and Development.” *World Development* 24(6): 1119-1132.

———. 1997. “The Eclipse of the State? Reflections on Stateness in and Era of Globalization.” *World Development* 50(1): 62-87.

Evans, Tony. 2011. “Professionals, Managers and Discretion: Critiquing Street-Level Bureaucracy.” *British Journal of Social Work.* 41: 368-386.

Evans, Tony and John Harris. 2004. “Street-Level Bureaucracy, Social Work and the (Exaggerated) Death of Discretion.” *British Journal of Social Work*. 34: 871-895.

Falletti, Tulia. 2005. “A Sequential Theory of Decentralization: Latin American Cases in Comparative Perspective.” *American Political Science Review* 99(3): 327-346.

Fan, Shenggen, Somchai Jitsuchon, & Nuntaporn Methakunnavut. 2004. *The Importance of Public Investment for Reducing Rural Poverty in Middle-Income Countries: The Case of Thailand.* Development Strategy and Governance Division Discussion Paper No. 7. Washington DC: International Food Policy Research Institute.

Feldman, Tine Rossing and Susan Assaf. 1999. *Social Capital: Conceptual Frameworks and Empirical Evidence, and Annotated Bibliography*. Social Capital Initiative Working Paper No. 5. Washington DC: The World Bank.

Fernandez, M. A. Z. 2004. “Managing the Fight Against Corruption through Partnerships among Government Agencies and with Civil Society: The Philippine Experience.” *Asia Review of Public Administration* 16(1): 91-99.

Fields, Karl 1997. "Strong States and Business Organization in Korea and Taiwan." In

Business and the State in Developing Countries, ed. Ben Ross Schneider and Sylvia Maxfield, 122-151. Ithaca, NY: Cornell University Press

FTP-UGM. 2006. "Laporan Akhir Kajian Teknologi dan Budaya: Studi Kasus Masyarakat Jawa (Final Resport Assessing Technology and Culture: A Case Study of Javanese Society)." Unpublished Report for BAPPENAS. Yogyakarta, Indonesia: Gajah Mada University.

Fukuyama, Francis. 1996. *Trust: The Social Virtues and the Creation of Prosperity.* The Free Press.

———. 2002. "Social Capital and Development: The Coming Agenda." *SAIS Review* 22(1): 23-37.

Gandhi, Jennifer. 2008. *Political Institutions under Dictatorship*. New York, NY: Cambridge University Press.

Gandhi, Jennifer and Adam Przeworski. 2007. "Authoritarian Institutions and the Survival of Autocrats." *Comparative Political Studies* 40 (11): 1279-1301.

Garces-Restrepo, Carlos, Douglas Vermillion, and Giovanni Munoz. 2007. *Irrigation Management Transfer: Worldwide Efforts and Results*. Rome: Food and Agriculture Organization of the United Nations.

George, Alexander L., and Andrew Bennett. 2005. *Case Studies and Theory Development in the Social Sciences.* Cambridge, MA: MIT Press.

Gerring, John. 2007. *Case Study Research: Principles and Practices.* New York: Cambridge University Press.

Girod, Desha. 2012. "Effective Foreign Aid Following Civil War: The Non-Strategic-

Desperation Hypothesis." *The American Journal of Political Science* 56(1): 188-201.

Grief, Avner. 2006. *Institutions and the Path to the Modern Economy*. New York: Cambridge University Press.

Grindle, Merilee. 2004. *Despite the Odds.* Princeton, NJ: Princeton University Press.

———. 2007. *Going Local.* Princeton: Princeton University Press.

Grindle, Merilee, and John Thomas. 1991. *Public Choice and Policy Change: The Political Economy of Reform in Developing Countries*. Baltimore, MD: Johns Hopkins University Press.

Gunasekara, Charles. 1996. "Philippines: Communal Irrigation Projects." In *The World Bank Participation Sourcebook,* 109-116. Washington DC World Bank.

Hadiz, Vedi R. 2003. "Reorganizing Political Power in Indonesia: A Reconsideration of So-Called 'Democratic Transitions.'" *Pacific Review* 16(4): 591-611.

Haggard, Stephen. 1990. *Pathways from the Periphery: The Politics of Growth in the Newly Industrializing Countries*. Ithaca, NY: Cornell University Press.

Hall, Peter and David Soskice. 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford University Press.

Hardin, Garret. 1968. "The Tragedy of the Commons." *Science* 162: 1243-1248.

Heredia, Blanca and Ben Ross Schneider. 2003. "The Political Economy of Administrative Reform in Developing Countries." In *Reinventing the Leviathan: The Politics of Administrative Reform in Developing Countries*, ed. Ben Ross Schneider and Heredia Blanca, 1-29. Coral Gables, FL: North-South Center Press

at the University of Miami.

Hirschman, Albert. 1970. *Exit, Voice, and Loyalty.* Harvard: Harvard University Press.

Hoynck, Sabine and Armin Rieser. 2002. "The Dynamics of Water User Associations in a Large-Scale Irrigation System in Thailand." *Technology Resource Management & Development – Scientific Contributions for Sustainable Development*. Vol 2: 1-22.

Huber, John D. and Charles R. Shipan. 2002. *Deliberate Discretion? The Institutional Foundations of Bureaucratic Autonomy*. New York, NY: Cambridge University Press.

Huntington, Samuel. 1968. *Political Order in Changing Societies*. New Haven, CT: Yale University Press.

Hutchcroft, Paul. 1998. *Booty Capitalism: The Politics of Banking in the Philippines.* Ithaca, NY: Cornell University Press.

Hutchcroft, Paul and Joel Rocamora. 2003. "Strong Demands and Weak Institutions: The Origins and Evolution of the Democratic Deficit in the Philippines." *Journal of East Asian Studies* 3: 259-292.

Intal, Ponciano S. and Marissa C. Garcia. 2005. *Rice and Philippine Politics.* Discussion Paper Series No. 2005-13. Makati City, Philippines: Philippine Institute for Development Studies.

Jones, William I. 1995. *The World Bank and Irrigation*. Washington DC: The World Bank.

Jordan, A. Grant. 1981. "Iron Triangles, Woolly Corporatism and Elastic Nets: Images of the Policy Process." *Journal of Public Policy* 1 (1): 95-123.

Kang, David. 2002. *Crony Capitalism: Corruption and Development in South Korea and the Philippines*. Cambridge: Cambridge University Press.

Kaufman, Herbert. 1960. *The Forest Ranger: A Study in Administrative Behavior.* Baltimore, MD: Johns Hopkins University Press.

Keyes, Charles F. 1995. "Hegemony and Resistance in Northeast Thailand." in *Regions and National Integration in Thailand, 1982-1992,* ed. Voker Grabowsky, 154-181. Wiesbaden: Harrossowitz.

Kingsbury, Damien and Harry Aveling, eds. 2002. *Autonomy and Disintegration in Indonesia.* New York: RoutledgeCurzon Publishers.

Knight, Jack. 1992. *Institutions and Social Conflict*. Cambridge, UK: Cambridge Univeristy Press

Ko, Hai-Sheng. 2002. *Case Study from Taiwan, Survey on Irrigation Modernization: Scheme of Tao-Yuan Irrigation Association*. Colombo, Sri Lanka: International Water Management Institute.

Korten, Francis F. and Robert Y. Siy, eds. 1989. *Transforming a Bureaucracy: The Experience of the Philippine National Irrigation Administration.* West Hartford, CT: Kumarian Press.

Kulon Progo Statistics Office. 2010. *Kulon Progo Regency in Figures 2010.* Wates, Indonesia: Kulon Progo Statistics Office.

Kuo, Cheng-tian. 1995. *Global Competitiveness and Industrial Growth in Taiwan and the Philippines.* Pittsburgh, PA: University of Pittsburgh Press.

Lake, David, and Matthew A. Baum. 2001. "The Invisible Hand of Democracy: Political

Control and the Provision of Public Services.” *Comparative Political Studies* 34 (6): 587-621.

Lam, Wai Fung. 1996. “Institutional Design of Public Agencies and Coproduction: A Study of Irrigation Associations in Taiwan." *World Development* 24 (6): 1039-1054.

———. 1998. *Governing Irrigation Systems in Nepal: Institutions, Infrastructure, and Collective Action*. Oakland, CA: ICS Press.

———. 2001. “Coping with Change: A Study of Local Irrigation Institutions in Taiwan.” *World Development* 29(9): 1569-1592.

———. 2005. “Reforming Taiwan's Irrigation Associations: Getting the Nesting of Institutions Right.” in *Asian Irrigation Systems in Transition: Responding to Challenges Ahead*, eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 346-365. Thousand Oaks: Sage Publications.

———. 2006. “Foundations of a Robust Social-Ecological System: Irrigation Institutions in Taiwan.” *Journal of Institutional Economics* 2 (2): 203-226.

Lande, Carl H. 1996. *Post-Marcos Politics: A Geographical and Statistical Analysis of the 1992 Presidential Elections*. New York: St. Martin's Press.

Lansing, J. Stephen. 2007. *Priests and Programmers: Technologies of Power in the Engineered Landscape of Bali.* Reprinted edition. Princeton, NJ: Princeton University Press.

Larson, Anne M. 2005. “Democratic Decentralization in the Forestry Sector: Lessons

Learned from Africa, Asia, and Latin America." in *The Politics of Decentralization: Forests, Power, and People*, eds. Carol J. Pierce Colfer and Doris Capistrano, 32-62. London: Earthscan.

Larsson, Tomas. 2008. "Western Imperialism and Defensive Underdevelopment of Property Rights Institutions in Siam." *Journal of East Asian Studies* 8: 1-28.

Lauraya, Fay M. and Antonia Lea R. Sala. 1995. *Performance Determinants of Irrigators Associations in National Irrigation Systems in Bocol, the Philippines: An Analysis.* IIMI Country Paper, the Philippines No. 4. Colombo, Sri Lanka: International Irrigation Management Institute.

Levine, Gilbert. 1977. "Management Component in Irrigation System Design and Operation." *Agricultural Administration* 4: 37-48.

Li, Tania M. 2002. "Engaging Simplifications: Community-Based Resource Management, Market Processes and State Agendas in Upland Southeast Asia." *World Development* 30(2): 265-283.

———. 2007. *The Will to Improve*. Durham, NC: Duke University Press.

Lindauer, David L. & Lant Pritchett. 2002. "What's the Big Idea? The Third Generation of Policies for Economic Growth." *Economia* (Fall): 1-39.

Lipsky, Michael. 2010. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services.* 30th Anniversary, Expanded Edition. New York: Russell Sage Foundation.

Little, Peter D. 1992. *The Elusive Granary: Herder, Farmer, and State in Northern Kenya.* Cambridge: Cambridge University Press.

Magaloni, Beatriz. 2008. "Credible Power-Sharing and the Longevity of Authoritarian Rule." *Comparative Political Studies* 41(4/5): 715-741.

Mahoney, James and Gary Goertz. 2006. "A Tale of Two Cultures: Contrasting Quantitative and Qualitative Research." *Political Analysis* 14: 227-249.

Mansbridge, Jane. 2010. "Beyond the Tragedy of the Commons: A Discussion of *Governing the Commons: The Evolution of Institutions for Collective Action*." *Perspectives on Politics* 8(2): 590-593.

Mansfield, Edward D., Helen V. Milner, and B. Peter Rosendorff. 2002. "Why Democracies Cooperate More: Electoral Control and International Trade Agreements." *International Organization* 56 (3): 477-513.

Marcos, Ferdinand. 1974. *The Democratic Revolution in the Philippines.* Englewood Cliffs, NJ: Prentice Hall International.

McCubbins, Mathew, Roger G. Noll, and Barry R. Weingast. 1987. "Administrative Procedures as Instruments of Political Control." *Journal of Law, Economics, & Organization* 3 (2): 243-277.

McDermott, Gerald. 2007. "The Politics of Institutional Renovation and Economic Upgrading: Recombining the Vines that Bind in Argentina." *Politics & Society* 35 (1): 103-143

McGuire, Martin C. and Macur Olson. 1996. "The Economics of Autocracy and Majority Rule: The Invisible Hand and the Use of Force." *Journal of Economic Literature* 34: 72-96.

McKean, Roland N. 1965. "The Unseen Hand in Government." *The American Economic*

Review 55(3): 496-506.

Meier, Gerald. M. 2001. “The Old Generation of Development Economists and the New,” in *Frontiers of Development Economics*, eds. Gerald M. Meier & Joseph Stiglitz, 13-50. New York: Oxford University Press.

Migdal, Joel. 1988. *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World.* Princeton, NJ: Princeton University Press.

Mingsarn Khao-saad, et. al. 2001. *Neaw Nayobai Kanjadkan Nam Samrab Prathed Thai (Water Management Policies for Thailand).* Volume 1 and 2. Bangkok: Thailand Development Research Institute.

Missingham, Bruce. 1997. “Local Bureaucrats, Power, and Participation: A Study of Two Village Schools in the Northeast,” in *Political Change in Thailand: Democracy and Participation,* ed. Kevin Hewison, 149-162. New York: Routledge.

Moe, Terry M. 1989. "The Politics of Bureaucratic Structure." In *Can the Government Govern?* , ed. John E. Chubb and Paul E. Peterson, 267-329. Washington DC: The Brookings Institution.

———. 2006. “Political Control and the Power of the Agent.” *The Journal of Law, Economics, & Organization* 22 (1): 1-29.

Molle, Francois. 2005. “The Closure of the Chao Phraya River Basin in Thailand: Its Causes, Consequences, and Policy Implications.” in *Asian Irrigation in Transition: Responding to Challenges,* eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 206-225. Thousand Oaks: Sage Publications.

Molle, Francois, and J. Berkoff, eds. 2007. *Irrigation Water Pricing: The Gap Between Theory and Practice.* Cambridge, MA: CAB International.

Molle, Francois, Chatchom Chompadist, Thippwal Srijantr, and Jesda Keawkulaya. 2001. *Dry-Season Water Allocation and Management in the Chao Phraya Delta*. DORAS-DELTA Research Report No. 8. Khon Kaen Thailand.

Molle, Francois, Nittaya Ngernprasertsri, and Savakon Sudsawasd. 2002. "Are Water User Organizations Crucial for Water Management? A Post-Mortem Analysis of Water User Groups in Thailand and the Prospect for Reincarnation." Presented at the 6th Conference on Participatory Irrigation Management, Beijing, China, April 20-26.

Molle, Francois, Philippe Floch, Buapun Promphakping, and David J.H. Blake. 2009. "The 'Greening of Isaan': Politics, Ideology, and Irrigation Development in the Northeas of Thailand." In *Contested Waterscapes in the Mekhong Region: Hydropower, Livelihoods, and Governance*, ed. Tira Foran, Francois Molle, and Mira Kakonen, 253-280. Sterling, VA: Earthscan

Mollinga, Peter and Alex Bolding, eds. 2004. *The Politics of Irrigation Reform: Contested Policy Formulation and Implementation in Asia, Africa, and Latin America*. Burlington, VT: Ashgate Publishing

Moore, Mick. 1989. “The Fruits and Fallacies of Neoliberalism: The Case of Irrigation Policy.” *World Development* 17 (11): 1733-1750.

Mosse, David. 2003. *The Rule of Water: Statecraft, Ecology, and Collective Action in South India*. New Delhi, India: Oxford University Press.

Mukherji, Aditi, Blanka Fuleki, Tushaar Shah, Diana Suhardiman, Mark Giordano, and Parakrama Weligamage. 2011. "Irrigation Reform in Asia: A Review of 108 Cases of Irrigation Management Transfer." Presented at IASC Biennial International Conference on Sustaining the Commons: Sustaining Our Future, Hyderabad, India, January 10-14.

Mukherji, Aditi, Thierry Facon, Charlotte de Fraiture, David Molden, and Colin Chartres. 2012. “Growing More Food with Less Water: How Can Revitalizing Asia's Irrigation Help?” *Water Policy* 14 (3): 430-446.

Nadvi, Khalid. 1999. “Collective Efficiency and Collective Failure: The Response of the Sialkot Surgical Instrument Cluster to Global Quality Pressures.” *World Development* 27(9): 1605-1626.

Narayan, Deepa and Lant Pritchett. 1999. “Cents and Sociability: Household Income and Social Capital in Rural Tanzania.” *Economic Development and Cultural Change.* 47(4): 871-897.

National Irrigation Administration. 1990. *A Comprehensive History of Irrigation in the Philippines*. Manila, Philippines: National Irrigation Administration.

Neef, Andreas. 2009. “Transforming Rural Water Governance: Towards Deliberative and Polycentric Models?” *Water Alternatives* 2(1): 53-60.

Nelson, Joan. 1999. *Reforming Health and Education: The World Bank, the IDB, and Complex Institutional Change.* Washington DC: Overseas Development Council.

Nishizaki, Yoshinori. 2011. *Political Authority and Provincial Identity in Thailand: The Making of Banharn-buri.* Ithaca, NY: Cornell Southeast Asia Program

Publications Program.

North, Douglass C. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.

North, Douglass C. and Barry R. Weingast. 1989. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England." *The Journal of Economic History* 49 (4): 803-832.

Office of Public Participation Promotion. 2011. *Kaew Su Khwam Samred: Kanborihanjadkan Chonprathan doi Kasetakon mi Suan Ruam (Moving Toward Success: Managing Irrigation with Farmer Participation)* . Bangkok: Royal Irrigation Department.

Olson, Mancur. 1965. *The Logic of Collective Action*. Boston, MA: Harvard University Press.

———. 1993. "Dictatorship, Democracy, and Development." *The American Political Science Review* 87 (3): 567-576.

Operations Evaluation Department. 1996. *Irrigation O&M and System Performance in Southeast Asia: An OED Impact Study*. Washington DC: The World Bank.

Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

———. 1992. *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco, CA: Institute for Contemporary Studies.

———. 1996. "Crossing the Great Divide: Coproduction, Synergy, and Development." *World Development* 24(6): 1073-1087.

———. 1998. “A Behavioral Approach to the Rational Choice Theory of Collective Action: Presidential Address, American Political Science Association, 1997.” *American Political Science* Review 92(1): 1-22.

———. 2000. “Social Capital: Fad or Fundamental Concept?” in *Social Capital: A Multifaceted Perspective*, eds. Partha Dasgupta and Ismail Serageldin, 172-214. Washington DC: The World Bank.

Ostrom, Elinor, Larry Schroeder, and Susan Wynne. 1993. *Institutional Incentives and Sustainable Development*. Boulder, CO: Westview Press.

Parthasarathy, R. and Jharna Pathak. 2003. “The Guiding Visible Hand of Participatory Approaches to Irrigation Management.” in *Managing Water Resources: Policies, Institutions, and Technologies*, eds. V. Ratna Reddy and S. Mahendra Dev, 61-85. New Delhi, India: Oxford University Press.

Pasuk Phongpaichit and Chris Baker. 2005. *A History of Thailand.* New York: Cambridge University Press.

Peters, B. Guy, and Jon Pierre. 2001. "Civil Servants and Politicians: The Changing Balance." In *Politicians, Bureaucrats, and Administrative Reform*, ed. B. Guy Peters, and Jon Pierre, 1-9. New York, NY: Routledge

Plusquellec, Herve L. and Thomas Wickham. 1985. *Irrigation Design and Management: Experience in Thailand and its General Applicability*. Washington, DC The World Bank.

Postel, Sandra. 2001. "Growing More Food with Less Water." *Scientific American* 248(2): 46-50.

Przeworski, Adam, Michael Alvarez, Jose Cheibub, and Fernando Limongi. 2000. *Democracy and Development*. New York: Cambridge University Press.

Praphan Chitkham. 2012. "30 *Tambol Khong Chaengwat Kamphengphet Sang Khruakhai Ruamkan Jadkan Panha Nam Thuam/Nam Laeng (30 Districts of Kamphengphet Province Create an Organization for Collective Management of Droughts and Floods*." Presented as part of a panel on Participatory Management on Water, Experiences from the Field. Thailand Research Fund Annual Conference, Impact Arena, Muang Thong Thani, Thailand, June 21.

Pressman, Jeffrey L. and Aaron Wildavsky. 1984. *Implementation*. 3rd ed. Berkeley, CA: University of California Press.

Pritchett, Lant and Michael Woolcock. 2004. "Solutions when the Solution is the Problem: Arraying the Disarray in Development." *World Development* 32 (2): 191-212.

PU (Department of Public Works). 2004. "Data Set: Rekapitulasi P3A Menurut Kondisi dan Jumlah Areal Dareah Irigasi Yang di Tengani, Seluruh Provinsi Tahun Anggaran 2004." Jakarta, Indonesia: Department of Public Works.

———. 2006. *Perkumpulan Petani Pemakai Air (Water User Groups).* Ministry of Public Works, Department of Research and Development: Jakarta.

Putnam, Robert D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, NJ: Princeton University Press.

Raby, Namika. 1997. "Participatory Irrigation Management in the Philippines." Presented at the International Workshop on Participatory Irrigation Management, Cali,

Columbia, February 9-15.

———. 2000. "Participatory Irrigation Management in the Philippines: National Irrigation Systems." in *Case Studies in Participatory Irrigation Management*, eds. David Groenfeldt and Mark Svendsen. World Bank Institute: Washington DC.

Rachal, Patricia. 1982. *Federal Narcotics Enforcement: Reorganizations and Reform*. Boston: Auburn House.

Ragin, Charles C. 1987. *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press.

———. 1994. *Constructing Social Research: The Unity and Diversity of Method.* Thousand Oaks, CA: Pine Forge Press.

Rahman, M. Jamilur, Y. Kobayashi, F. Ahmed, L. Blanchetti-Revelli, K. Emzita, and M. Ehsan Khan 2003. *Report and Recommendation of the President to the Board of Directors on Proposed Loans to the Republic of Indonesia for the Participatory Irrigation Sector Project*. Manila, Philippines: Asia Development Bank.

Rap, Edmund. 2006. "The Success of a Policy Model: Irrigation Management Transfer in Mexico." *Journal of Development Studies* 42(8): 1301-1324.

Reppetto, Robert. 1986. *Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems.* Research Report No. 4. Washington DC: World Resources Institute.

Reuter, Ora John. 2010. "The Politics of Dominant Party Formation: United Russia and Russia's Governors." *Europe-Asia Studies* 62 (2): 293-327.

Reuter, Ora John and Thomas F. Remington. 2009. "Dominant Party Regimes and the

Commitment Problem: The Case of United Russia." *Comparative Political Studies* 42 (4): 501-526.

Rice, Edward B. 1997. *Paddy Irrigation and Water Management in Southeast Asia*. Washington DC: The World Bank.

Ricks, Jacob. 2008. "National Identity and the Geo-Soul: Spiritually Mapping Siam." *Studies in Ethnicity and Nationalism* 8(1): 120-141.

Ricks, Jacob and Sigit S. Arif. 2012. "Field Report: Local Success in Encouraging Participatory Irrigation Management: Policy Lessons from Indonesia." *Journal of International Development* 24(7): 946-949.

RID. Various years. *Annual Report*. Bangkok, Thailand: Royal Irrigation Department.

———. 2004a. *Rayngan Chabab Sudthay: Rayngan Pramern Phon Khrongkan Khanad Yai Khrongkan Prathan Lumnam Ping Ton Lang (Final Report: Report of the Results of Large Projects for the Lower Ping River Basin).* Volume 1.1. Bangkok: Royal Irrigation Department.

———. 2004b. *Ngan Tidtam Le Pramern Phon Khrongkan Perm Prasithiphab Kanphalit Nai Khet Chonprathan Le Laengnam Thammachat Klum Ngan Thi 2: Khrongkan Song Nam Le Bamrungraksa Mae Lao, Chaengwat Chiang Rai (Follow-Up on the Results of Increasing the Efficacy in Irrigation in the Natural Basins of Working Group 2: Operation and Maintenance Office Mae Law, Chiang Rai Province).* Bangkok: Royal Irrigation Department.

———. 2010. *Kanborikanjadkan Chonprathan doi Kasetakorn Mii Suan Ruam (Operation and Maintenance of Irrigation through Farmer Participation).*

Bangkok, Thailand: Royal Irrigation Department.

———. 2011a. *109 Pi Krom Cholprathan (109 Years of the Royal Irrigation Department).* Bangkok, Thailand: Royal Irrigation Department.

———. 2011b. "Banchee Sarub Jamnuan Ongkon Phu Chai Man Chonprathan Thuk Prapet Thi Khun Thabian Ruu Khun Banchee nai Khet Samnak Chonprathan Thi 1-17 (Accounting Summary of the Number of Water User Groups of All Types Registered in Irrigated Districts 1-17)." Bangkok: Royal Irrigation Department.

RID, Nakhorn Sri Thammarat. 2011. *Sarub Khrongkan Phem Prasitiphap Kannborihanjadkan Nam Nai Phunthi Khrongkan Annuang Ma Chak Phrarachadamri 8 Khrongkan Namrong Chaengwat Nakhorn Sri Thammarat Pracham Pii Nobpraman 2554 (Summary of the Project to Increase Efficacy of Management in 8 Royal Projects of Nakhorn Sri Thammarat Province in Fiscal Year 2011)* . Royal Irrigation Department: Nakhorn Sri Thammarat.

Riggs, Fred W. 1966. *Thailand: The Modernization of a Bureaucratic Polity*. Honolulu, HI: East-West Center Press.

Rock, Michael T. 2000. "Thailand's Old Bureaucratic Polity and Its New Semi-Democracy." in *Rents, Rent-Seeking and Economic Development*, eds. Mushtaq H. Khan and Jomo Kwame Sundaram. Pp. 182-206. New York: Cambridge University Press.

Rodrik, Dani. 2007. *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*. Princeton, NJ: Princeton University Press.

Rohdewohld, Rainer. 1995. *Public Administration in Indonesia* Victoria, Australia:

Montech Pty.

Rosegrant, Mark W. & Claudia Ringler. 2000. “Impact on Food Security and Rural Development of Transferring Water out of Agriculture.” *Water Policy* 1(6) 567-586.

Sacha Sethaputra et al. 2001. “Thailand's Water Vision: A Case Study.” in *From Vision to Action: A Synthesis of Experiences in Southeast Asia*, eds. Le Huu Ti and Thierry Facon, 71-98. FAO/ESCAP Project Report. Bangkok.

Saleth, R. Maria and Ariel Dinar. 2004. *The Institutional Economics of Water.* Northampton, MA: Edward Elgar.

Schrank, Andrew. 2006. "The Case Study and Causal Inference." In *A Handbook for Social Science Field Research*, ed. Ellen Perecman and Sara Curran, 169-174. Thousand Oaks, CA: Sage Publications.

———. 2011. “Co-producing Workplace Transformation: The Dominican Republic in the Comparative Perspective.” *Socio-Economic Review* 9: 419-445.

Schneider, Ben Ross. 2004. *Business, Politics, and the State in Twentieth-Century Latin America.* New York: Cambridge University Press.

Schneider, Ben Ross and Sylvia Maxfield, eds. 1997. *Business and the State in Developing Countries*. Ithaca, NY: Cornell University Press.

Schneider, Ben Ross and Richard F. Doner. 2000. “The New Institutional Economics, Business Associations, and Development.” *Brazilian Journal of Political Economy* 20(3): 39-62.

Scott, James C. 1998. *Seeing Like a State: How Certain Schemes to Improve the Human*

Condition Have Failed. New Haven, CT: Yale University Press

Selway, Joel Sawat. 2011. “Electoral Reform and Public Policy Outcomes in Thailand: The Politics of the 30-Baht Health Scheme.” *World Politics* 63 (01): 165-202.

Shivakoti, Ganesh P. 2003. “Facilitating Policies for Improved Governance and Management of Asian Irrigation Systems.” Paper presented at the Workshop of Political Theory and Policy Analysis, Indiana University, Sept 22.

Sidel, John T. 1999. *Capital, Coercion, and Crime: Bossism in the Philippines.* Stanford, CA: Stanford University Press.

Siegel, James T. 1998. “Early Thoughts on the Violence of May 13 and 14, 1998 in Jakarta.” *Indonesia* 66: 74-108.

Siy, Robert. 1989. “A Tradition of Collective Action: The Farmers and Irrigation in the Philippines.” in *Transforming a Bureaucracy: The Experience of the Philippine National Irrigation Administration*, eds. Frances F. Korten and Robert Y. Siy, 20-30. West Hartford, CT: Kumarian Press.

Slater, Dan. 2005. "Ordering Power: Contentious Politics, State-Building, and Authoritarian Durability in Southeast Asia." PhD diss, Emory University

———. 2008. “Can Leviathan be Democratic? Competitive Elections, Robust Mass Politics, and State Infrastructural Power.” *Studies in Comparative International Development* 43(3): 252-272.

Snyder, Richard. 2001. “Scaling Down: The Subnational Comparative Method.” *Studies in Comparative International Development*. 36(1): 93-110.

Soenarno. 1995. "Irrigation Management Transfer in Indonesia " In *Irrigation*

Management Transfer in Asia: Papers from the Expert Consultation on Irrigation Management Transfer in Asia, *Papers from the Expert Consultation on Irrigation Management Transfer in Asia*, eds J.C.M.A. Geijer et al. Bangkok and Chiang Mai, Thailand, September 25-29. Colombo, Sri Lanka: IWMI.

Somchai Phatharathananunth. 2002. "Political Resistance in the Isan." *Tai Culture: International Review on Tai Cultural Studies* 7(1): 106-132.

Somkid Buapeng. N.D. "Groundwater Situation and Land Subsidence Mitigation in Bangkok and Its Vicinity." Presentation at the Department of Groundwater Resources, Ministry of Natural Resources and Environment, Bangkok, Thailand.

Stavis, Benedict. 1974. *Rural Local Governance and Agricultural Development in Taiwan*. Rural Development Committee, Center for International Studies. Ithaca, NY: Cornell University.

Suhardiman, Diana. 2008. "Bureaucratic Designs: The Paradox of Irrigation Management Transfer in Indonesia." PhD diss, Wageningen University.

Sukit Kanjina. 2008. "Participatory Water Resource Management in Thailand: Where are the Local Communities?" Paper Presented at the 12th Biennial Conference of the International Association for the Study of the Commons, Cheltenham, England, July 14-18.

Svendsen, M. & Douglas L. Vermillion. 1994. *Results of Irrigation Management Transfer in the Columbia Basin Project, USA.* Short Report Series on Locally Managed Irrigation No. 15. Colombo, Sri Lanka: International Water Management Institute.

Tadem, Eduardo C. 1986. *Grains and Radicalism: The Political Economy of the Rice Industry in the Philippines: 1965-1985.* Commodity Series No. 5. Quezon City, Philippines: University of the Philippines Third World Studies Center.

Tassanee Ounvichit. 2005. “People's Participation in Irrigation Management in Thailand.” In *Asian Irrigation Systems in Transition: Responding to Challenges Ahead*, eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 366-389. Thousand Oaks: Sage Publications.

TDRI. 2002. “Executive Summary, Small-scale Water Resource Utilization and Management.” Prepared for the NESDB. Bangkok, Thailand: Thailand Development Research Institute.

Tendler, Judith. 1997. *Good Government in the Tropics.* Baltimore: The Johns Hopkins University Press.

Therkildsen, Ole. 2006. "Elusive Public Sector Reforms in East and Southern Africa." In *Public Sector Reform in Developing Countries: Capacity Challenges to Improve Services*, ed. Yusuf Bangura and George A. Larbi, 53-81. New York, NY: Palgrave Macmillan Publishing

Thies, Cameron G. 2005. “War, Rivalry, and State Building in Latin America.” *American Journal of Political Science* 49(3): 451-465.

Thongchai Winichakul. 1994. *Siam Mapped: A History of the Geo-Body of a Nation.* Honolulu: University of Hawai'i Press.

Tsai, Lily. 2007. “Solidary Groups, Informal Accountability, and Local Public Goods Provision in Rural China.” *American Political Science Review* 101(2): 355-372.

Tsebelis, George. 1995. “Decision Making in Political Sysetms: Veto Players in Presidential, Parliamentarism, Multicameralism, and Multipartyism.” *British Journal of Political Science* 25(3): 289-325.

Unger, Daniel and Patcharee Siroros. 2011. “Trying to Make Decisions Stick: Natural Resource Policy Making in Thailand.” *Journal of Contemporary Asia* 41(2): 206-228.

United Nations. 1992. "Report of the United Nations Conference on Environment and Development." In *Conference on Environment and Development*. Rio de Janeiro: United Nations.

———. 2006. *National Water Development Report: Thailand.* Report Prepared within the Framework of the 2nd Phase of the World Water Development Programme. New York: United Nations.

United States Bureau of Reclamation. 2000. *Brief History of the Bureau of Reclamation*. Denver, CO: Bureau of Reclamation History Program.

Uphoff, Norman. 1991. *Managing Irrigation: Analyzing and Improving the Performance of Bureaucracies.* New Delhi, India: Sage Publications.

Vanpen Surarerks. 2006. “Muang Fai Communities in Nothern Thailand: People's Experiences and Wisdom in Irrigation Management.” *Journal of Developments in Sustainable Agriculture* 1: 44-52.

Vermillion, Douglas L. 1997. *Impacts of Irrigation Management Transfer: A Review of the Evidence*. Colombo, Sri Lanka: International Irrigation Management Institute.

———. 2005. “Irrigation Sector Reform in Asia: From 'Participation with Patronage' to

'Empowerment with Accountability.'" in *Asian Irrigation Systems in Transition: Responding to Challenges Ahead*, eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 409-434. Thousand Oaks: Sage Publications.

Vermillion, Douglas L., Madar Samad, Suprodjo Pusposutardjo, Sigit S. Arif, and Saiful Rochdyanto. 2000. *An Assessment of the Small-Scale Irrigation Management Turnover Program in Indonesia*. Colombo, Sri Lanka: International Water Management Institute

Vermillion, Douglas, Elinor Ostrom, and Robert Yoder. 2005. "The Future of Irrigated Agriculture in Asia: What the Twenty-First Century Will Require of Policies, Institutions, and Governance." in *Asian Irrigation Systems in Transition: Responding to Challenges Ahead*, eds. Ganesh Shivakoti, Douglas Vermillion, Wai-Fung Lam, Elinor Ostrom, Ujjwal Pradhan, and Robert Yoder, 491-505. Thousand Oaks: Sage Publications.

Wachiraporn Kumnerdpet. 2010. "Community Learning and Empowerment through Participatory Irrigation Management: Case Studies from Thailand." PhD diss, University of Manitoba.

Wade, Robert. 1975a. "Irrigation and Income Distribution: Three Papers." Discussion Paper No. 85. Institute for Development Studies. University of Sussex, England.

———. 1975b. "Administration and the Distribution of Irrigation Benefits." *Economic and Political Weekly* 10 (44/45): 1743-1747.

———. 1984. "Irrigation Reform in Conditions of Populist Anarchy: An Indian Case."

Journal of Development Economics 14 (3): 285-303.

———. 1988. “The Management of Irrigation Systems: How to Evoke Trust and Avoid Prisoner's Dilemma.” *World Development* 16(4): 489-500.

Waldner, David. 1999. *State Building and Late Development*. Ithaca, NY: Cornell University Press

Walker, Andrew. 2012. *Thailand's Political Peasants: Power in the Modern Rural Economy*. Madison, WI: University of Wisconsin Press.

Waterman, Richard, Amelia Rouse, and Robert Wright. 2004. *Bureaucrats, Politics, and the Environment*. Pittsburgh: University of Pittsburgh Press.

Weingast, Barry R. 1997. “The Political Foundations of Democracy and the Rule of Law.” *American Political Science Review* 91 (2): 245-263.

Wester, Philipus, Edwin Rap, & Sergio Vargas-Velazquez. 2009. “The Hydraulic Mission and the Mexican Hydrocracy: Regulating and Reforming the Flows of Water and Power.” *Water Alternatives* 2(3): 395-415.

Williams, Jack R. 1994. “Vulnerability and Change in Taiwan's Agriculture.” in *The Other Taiwan: 1945 to the Present*, ed. Murray A. Rubinstein, 215-233. Amork, NY: M.E. Sharpe.

Williams, Sandy, and Jim Weale. No Date. *Pro-Poor Interventions in Irrigated Agriculture: Issues, Options, and Proposed Actions: Indonesia*. Manila, Philippines: Asia Development Bank.

Whitaker, Gordon P. 1980. “Coproduction: Citizen Participation in Service Delivery.” *Public Administration Review* (May/June): 240-246.

Woo-Cummings, Meredith Jung-en. 1998. "National Security and the Rise of the Developmental State in South Korea and Taiwan." in *Behind East Asian Growth*, ed. Henry Rowen, 319-340. New York: Routledge.

———, ed. 1999. *The Developmental State*. Ithaca, NY: Cornell University Press.

The World Bank. 1991. *Staff Appraisal Report 9021-IND, January 25*. Washington DC: The World Bank.

———. 1993. *Water Resources Management.* Washington DC: The World Bank.

———. 1996. *Irrigation O&M and System Performance in Southeast Asia: An OED Impact Study*. Operations Evaluation Department Report No. 15824. Washington DC: The World Bank.

———. 2001. *Thailand Social Monitor: Poverty and Public Policy*. Report No. 23147-TH, Human Development Sector Unit, East Asia and Pacific Region. Bangkok: World Bank.

———. 2005. *Indonesia: Water Use Rights Study Stage 2, Final Report Volume 1*. Washington DC: The World Bank.

Wyatt, David. 2003. *Thailand: A Short History*. 2nd ed. New Haven, CT: Yale University Press.

Yogyakarta Special Administrative Area. 2005. *Regional Atlas*. Yogyakarta, Indonesia: Yogyakarta Provincial Government.

Zhu, Tianbiao. 2002. "Developmental States and Threat Perceptions in Northeast Asia." *Conflict, Security, & Development* 2(1): 5-29.