

Building Participatory Organizations for Common Pool Resource Management: Water User Group Promotion in Indonesia

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Summary. — States are increasingly striving to create participatory local organizations for joint management of common pool resources. What local conditions determine success of such state efforts? What effect do these efforts have? Drawing on controlled comparisons between three districts in Indonesia and an original survey of 92 water user groups, I demonstrate that local political contexts condition the effectiveness of participatory irrigation policies. When irrigation is politically salient, local politicians pressure bureaucrats to better engage with farmers. The data also show that training programs are not as effective at increasing water user organization activity as frequent contact between bureaucrats and farmers.

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1. INTRODUCTION

Since the 1980s, a growing body of research has emphasized the capacity of local organizations to manage common pool resources through collective action (Bardhan, 1993b; Ostrom, 1990, 2000; Ostrom & Gardner, 1993; Wade, 1987). In this work is an implicit, and sometimes explicit, critique of state efforts to control resource management. State control, or even interference, often eviscerates the institutions for collective action which have evolved over generations to deal with challenges in their environments (Agrawal & Chhatre, 2007; Ostrom, 2005).

This extremely valuable literature often implies a dichotomy between local organizations and a hierarchical centralized state, at times employing empirical tests contrasting the effectiveness of the two (e.g., Lam, 1998). Framing the world in this way, though, glosses over the fact that many common pool resource systems are jointly managed (Agrawal & Benson, 2011). In most countries, state policies are involved more than ever in common pool resources, often through participatory methods incorporating citizen groups (Agrawal, 2007). Rather than having either independent groups or state agencies individually manage resources, we instead see state actors promoting local organizations to accomplish developmental tasks in close collaboration with the state (e.g., Barr, Dekker, & Fafchamps, 2015; Edmonds, 2002). Often these organizations are products of top-down state policies rather than bottom-up collaboration among resource users. The questions then arise, under what conditions do these policies result in the creation and encouragement of effective participatory organizations? What effect do state efforts have?

These questions have broad-ranging relevance, from fisheries to farming villages to forest communities. As developing countries adopt participatory policies, often spurred by the international aid community, it is of vital interest to understand the local conditions that facilitate implementation of these policies and the effect of efforts to incorporate service recipient participation (Mansuri & Rao, 2013). In this essay, I examine these questions through investigating attempts by the Indonesian state to develop water user associations (WUA) to assist in the operation and maintenance of irrigation systems.

Irrigation has long held a privileged place in discussions of participatory management of common pool resources (Lam, 1996; Moore, 1989; Ostrom, 1990, 1992; Wade, 1987), and Southeast Asian cases have figured prominently in the discussion, both for their successes and challenges (Araral, 2005, 2009, 2011; Bruns, 1993; Fujiie, Hayami, & Kikuchi, 2005; Korten & Siy, 1989; Ricks, 2015; Svendsen, 1993; Vermillion, Samad, Pusposudardjo, Arif, & Rochdyanto, 2000). Recently, scholars focused on Indonesia have begun to analyze the national politics that shape irrigation policies (Bruns, 2004, 2013; Suhardiman, 2013, 2015; Suhardiman & Mollinga, 2012), an area of research often overlooked in earlier analyses (Mollinga & Bolding, 2004; Suhardiman, Giordano, Rap, & Wegerich, 2014). Synthesizing and building upon this work, Suhardiman and Giordano (2014) came to the conclusion that greater policy emphasis must be placed on farmer–agency interactions, suggesting that a sub-national focus on the farmer–agency relationship might provide better results than previous efforts to engage national-level policy (Oorthuizen, 2003; van der Zaag, 1992). Through a better understanding of local-level interactions, the goals of participatory irrigation management may be achieved.

Expanding on this point, I contend that the local political environment shapes implementation of participatory policies

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for resource management. Using a controlled comparison research design of three districts in Indonesia, I show that the success of state efforts to promote WUA was determined by the relationship between irrigation officials and farmers, which was contingent upon the political context of the district (von Luebke, 2009). Only when irrigation was an important political issue did the district leadership obligate bureaucrats to promote farmer participation. Thus, I underscore the vital role of local governments in shaping the incentive structure of street-level bureaucrats (Lipsky, 2010).

Further emphasizing the impact of interaction between officials and farmers, I present a second finding drawn from an original survey of 92 WUA. Here I demonstrate that training programs, although yielding some benefits, often fall short in their goal of promoting participation. Indeed, short-term or temporary training programs may even be counter-productive to institutional development and building a participatory relationship between state actors and farmers. The data show WUA activity was most strongly affected instead by the frequency of interaction between state officials and group leaders.

These findings emphasize the importance of local political contexts in determining the implementation of participatory policies. Successful outcomes in co-production of services require that bureaucrats and farmer groups develop the capacity to collaborate in joint management of resources (Evans, 1995, 1996; Lam, 1996; Ostrom, 1996), but decisions about policy made by centralized agencies are unlikely to succeed in this endeavor (Pritchett & Woolcock, 2004; Suhardiman & Giordano, 2014). Citizen demands translated through local politics, though, can encourage the development of participatory organizations and a collaborative relationship between state actors and service recipients.

The remainder of this essay is structured as follows. In Section 2, I provide a brief overview of some of the obstacles states face when promoting participatory organizations and hypothesize how these might be overcome at the local level. Section 3 provides background on the Indonesian policy context. I then describe my research methods and data collection strategy in Section 4 before turning to my qualitative comparisons across three districts in Yogyakarta in Section 5 and presenting the results of the WUA survey in Section 6. In the conclusion, I discuss the implications of these findings.

2. POLITICS, BUREAUCRATS, AND PARTICIPATORY POLICY IMPLEMENTATION

Building local organizations necessary for participatory management of common pool resources is a complex developmental task. While researchers have identified some of the conditions and principles necessary for such groups (Agrawal, 2003; Araral, 2009; Ostrom, 1992), these approaches can neglect the politics that shape state actions regarding participatory organizations (Mollinga, 2008; Mollinga & Bolding, 2004). In this section I first briefly describe the challenges states face in building participatory organizations. This highlights the vital role of bureaucracies and especially street-level bureaucrats (Lipsky, 2010; Suhardiman & Giordano, 2014; Wade, 1992). I then argue the relevance of local political contexts in shaping the incentive structures of officials who implement participatory policies.

Participatory organizations are difficult for states to build because they run contrary to the incentive structure and organizational culture of centralized bureaucracies (Grindle, 1997;

Quarles van Ufford, 1988; Scott, 1998). This is especially true of irrigation agencies, which often adopt a “hydraulic mission” or bureaucratic identity prioritizing large infrastructure projects rather than reforms necessary for participatory management (Molle, Mollinga, & Wester, 2009; Suhardiman & Giordano, 2014; Suhardiman *et al.*, 2014). Thus when state officials are charged with forming a participatory organization, implementation fails for a number of reasons including poor alignment with bureaucratic goals, high information and transaction costs, and the difficulty of measuring participatory outcomes (Lam, 1998; Pritchett & Woolcock, 2004; Ricks, 2015; Suhardiman, 2013, 2015). Thus, it should be unsurprising when state efforts to develop WUA fall short of expectations. In fact, we should anticipate finding more failed groups than successful ones.

Even so, we have examples in which state actors do coordinate and cooperate with farmer groups. Lam (1996, 2001) demonstrates that effective WUA in Taiwan emerged from a unique institutional milieu in which local irrigation officials have strong incentives to work closely with farmers. Officials live in the communities they serve, they face community pressure, and they interact daily with the farmers who use irrigation. This social embeddedness of officials contributes to the strength and effectiveness of the organizations (see also Evans, 1995; Moore, 1989). Tandler (1997) found similar outcomes among extension agents in Brazil wherein the officials’ performance was conditioned on their relationship with service recipients. Street-level bureaucrats that develop a rapport with those they serve produce better policy outcomes because their implementation efforts are better directed at the local needs (Oorthuizen, 2003; van der Zaag, 1992; Wade, 1992).

Thus, if farmer–agency interface is so important (Suhardiman & Giordano, 2014), what conditions create incentives for street-level bureaucrats to develop close relationships with service recipients? Here I suggest that we must pay closer attention to the role of politicians. While bureaucracies can, at times, have independent missions and interests, their ultimate incentive structures are set by politicians who control the purse strings (Huber & Shipan, 2002). Drawing again on the findings of Tandler (1997), the effectiveness of civil servants arose not only from their relationship with service recipients; it was also conditioned on the incentives, pressures, and praise they received from politicians (Lipsky, 2010; McCubbins, Noll, & Weingast, 1989; Moe, 1984).

Politicians, though, react to their own incentive structure. Their main motivation is to remain in office, but being a political leader is time-consuming. They cannot address all policy issues that require attention. Thus they will react most strongly and quickly to those policy issues that can threaten their tenure; otherwise they often allow the status quo bureaucracy to deal with policy issues as they appear (Besley & Burgess, 2002; Grindle & Thomas, 1991). In other words, demand-side constraints shape their incentives (Winters, Karim, & Martawardaya, 2014). Following this logic, I propose that when irrigation becomes salient to a politician’s success, he or she will exert control over the irrigation agency, incentivizing officials to engage more closely with farmers. This, in turn, should lead to better participatory outcomes.

Such pressures should be much more salient at the local level. A focus on irrigation is rarely a nationwide political strategy,¹ but locally it can be very important. Proponents of decentralization have argued that by bringing governance decisions closer to the people, service provision will improve through increased accountability and responsiveness (Bardhan, 2002; Diamond, 1999; Faguet, 2004). Thus

subnational discrepancies can be explained by variation in political prominence of irrigation.

In sum, in countries that have already adopted participatory policies, I hypothesize that two issues are ultimately salient in the implementation of those policies. First, the relationship between bureaucrats and service recipients will determine the efficacy of participatory groups (Suhardiman & Giordano, 2014). If bureaucrats are aloof outsiders who are merely implementing top-down policies, we should expect to see paper organizations with little effect. On the other hand, if bureaucrats develop close and enduring relationships with farmers, then we will see more effective WUA emerge.

Second, the local political context should shape the incentives of bureaucrats. In areas where political pressure for irrigation management reaches politicians, those political leaders will wield their influence to pressure bureaucrats to work more closely with farmers. This should lead to better participatory outcomes. Alternatively, where irrigation is not politically salient, we should see the bureaucracy being left to its own internal incentive structure.

Indonesia provides an excellent opportunity to test these two propositions. Due to massive decentralization during its democratic transition, individual districts exercise extensive control over both policy implementation and budgets (Sjahrir, Kis-Kasot, & Shulze, 2014).² Variation between districts grants the opportunity to seek out successful cases and compare them with relatively less successful cases while holding a variety of variables constant. In the next section I describe the Indonesian policy context before progressing to my research design.

3. THE INDONESIAN POLICY CONTEXT

Scholars working on Indonesia have emphasized the politics of national water policies, especially those regarding participatory irrigation management (Bruns, 2004; Lansing, 2007; Suhardiman, 2013, 2015; Suhardiman & Mollinga, 2012). My own analysis, though, focuses on the local level, treating this national policy environment as exogenous. Thus I only provide a few brief details here about national policies to clarify the context in which my research took place.

Indonesia's current WUA framework is largely drawn from the 1987 Irrigation Operation and Maintenance Policy, which emerged out of international donor pressure in the wake of the 1980s oil crisis (Bruns, 2004). In accordance with the policy, three types of WUA exist, which operate in similar fashion albeit at different canal levels. At the tertiary canal are the basic water user groups, or *perkumpulan petani pemakai air* commonly called P3A. Membership ranges from only a few to a few hundred farmers, according to canal length, population density, and area watered. At the secondary canal level, a group of P3A can combine to become an Integrated Water User Group, or *gabungan P3A* or GP3A. These generally include thousands of farmers. Finally, at the primary canal level, a group of GP3A can join together to become a Major Water User Group, *induk P3A* or IP3A. They are rare, though.

Ideally, WUA should have responsibility over operating and maintaining the irrigation systems in their territory. In reality, throughout much of its history, the irrigation agency limited the role of farmers; they were expected to provide labor for projects and pay water user fees to the irrigation agency but little else.

This changed in response to the 1997 financial crisis. Indonesia embarked on a massive and tumultuous transition,

encompassing both democratization and decentralization. Political and administrative authority was handed to districts, giving them a great deal of autonomy in policy development and implementation. At the same time, the government was forced to rely heavily on loans from international agencies in order to pay its bills. The agricultural sector depended on a package of loans from the World Bank, supported by other international donors, called the Water Sector Adjustment Loan (WATSAL). This program mandated that the Indonesian government engage in greater transfer of authority over irrigation systems to farmer participants. This resulted in a number of policies which expanded the role of WUA. They were assigned real responsibility over operating and maintaining their systems.

As implementation proceeded, though, forces in Jakarta were working to return control of irrigation systems nationwide back to the central government ministries (see Suhardiman, 2015). This resulted in the 2004 Law on Water Resources (UU No. 7, 2004).³ The new law, and the successive Presidential Instructions, returned the bulk of control over irrigation management to the hands of the bureaucracy, reversing many of the participatory efforts enacted from 2000 through 2006. Shortly thereafter, in 2008, another new law transferred authority over the basic water user groups (P3A) to the Ministry of Agriculture, while the irrigation agency within the Ministry of Public Works maintained authority over Integrated and Major Water User Groups (GP3A and IP3A). This created the administrative and political environment wherein the data presented here were collected.

4. RESEARCH DESIGN AND DATA COLLECTION

During the WATSAL program and the Water and Irrigation Sector Management Program (WISMP) which followed, World Bank evaluations gauged the success of the participatory policies throughout the provinces sharing in the projects. When the first phase of the WISMP loan ended in 2011, the program was evaluated prior to the disbursement of the second tranche of the loan.⁴ While the World Bank chose not to delay the program's second phase, a Ministry of Public Works Official explained that only two of the participating provinces had achieved necessary outcomes for advancement to the second stage of the loan program (personal communication, Yogyakarta, June 13, 2011). One of these was Yogyakarta Special Administrative Region; the other was Nusa Tenggara Barat. This indicated that Yogyakarta had achieved some level of success at meeting the program goals, including improved institutional capacity among water user groups.

Even so, within Yogyakarta, different districts experienced variation in their success at promoting WUA. This provides an important methodological opportunity to investigate the research questions posed above. First, I conducted a comparative case design, implementing controlled comparisons of three districts within Yogyakarta. Thanks to similarities across the three districts, I was able to hold many variables constant while observing variation in the success of WUA promotion (Slater & Ziblatt, 2013). This allowed me to address the proposition that local political context should shape the implementation of participatory policies.

Second, seeking to better understand the effect of state efforts to promote WUA, I conducted a survey within a single district. P3A organizations from Sleman district have experienced uncommon success in recent years. Indonesia holds a yearly competition both to reward and encourage WUA to

develop their capacity to accomplish collective action. In these yearly competitions, basic water user groups from the Sleman district are considered as some of the country's top performers. This evidenced either some degree of excellence in the training program or some special characteristic unique to Sleman's water user groups. Initial research had indicated that it was due to training efforts of the irrigation agency (Ricks & Arif, 2012). Thus, I developed the survey to better understand how the relationship between irrigation officials and farmers determined WUA activity.

The data for this study were gathered in two phases. Phase I, carried out from January through October 2011, was primarily qualitative in nature. I accessed primary data by visiting local government offices, observing meetings of both government officials and WUA, accompanying the evaluation committee for the annual WUA competition, and visiting with leaders of farmer groups. I also conducted over 70 semi-structured interviews with farmer leaders, government officials, and researchers. Contacts were initially drawn from snowballing methods beginning with local researchers, then spreading into local government agencies, and finally meeting with leaders of both successful and unsuccessful farmer organizations.

Interviews with farmer leaders discussed aspects of WUA activity, including farmer organization, operations and maintenance of canals, as well as basic information about the group. Further questions addressed the history of the group and its relationship with the irrigation and agriculture agencies. I asked farmer leaders to offer their own explanations of group success or failure. Interviews with government officials included requests to identify successful groups, explain their own definitions of success, and describe their own interaction with WUA. I also asked questions regarding the history of the district agencies' interaction with farmers and the effect of policy changes. Discussions with government officials often involved evaluations of a number of groups as well as deeper exchanges regarding bureaucratic incentives, agency efforts to work with WUA, and officials' own experiences regarding farmer groups. Interviews with local researchers focused primarily on attaining understanding of the local context, including history of the bureaucratic agencies in the region. In all cases, the semi-structured nature of the interview allowed respondents to answer questions broadly and direct the conversation toward the aspects of irrigation management and farmer-agency cooperation that they felt were most important.

Phase II included a face-to-face survey drawing on the lessons learned from the earlier qualitative work. Using data from the district irrigation and agriculture agencies, I identified 441 basic water user groups (P3A) in Sleman District. Of these, I used proportional quota sampling to choose 100 groups, drawing a representative number from each sub-district. In cases where the chosen group was unavailable, the most proximate P3A group was substituted. From the process, 92 valid surveys were completed from October 2013 through early 2014.

Because the survey relied on responses from farmer leaders, I oversampled "active" groups. While this choice would be detrimental to a study seeking to abide the assumptions of probability sampling, for my purposes this is less troubling for two reasons. First, in order to obtain information about the groups, I needed to be able to contact farmers who could comment on the group's status. If a group was completely inactive and no farmer leader was available to survey, including that group in the sample would have been futile. Second, while the sampling framework limits the conclusions I can draw about the broader population of water user groups, it

does give sufficient variation between groups which had been trained by the irrigation department (54 valid responses) and those which had not been trained (31 valid responses). A smaller proportion reported having taken part in a recent training program, which had been more clearly geared toward WUA promotion (35 valid responses). Thus the survey data allow me to draw conclusions about the effect of state efforts to promote these groups.

5. DISTRICT COMPARISONS

In this section I address the first question posed in the introduction: under what conditions do participatory policies result in the creation and encouragement of effective participatory organizations? I do this by comparing the success of WUA promotion strategies across three districts in Yogyakarta: Bantul, Kulon Progo, and Sleman. Thus, my unit of analysis is the district. First I define my dependent variable and explain how I measured it. I then evaluate five alternate explanations for the observed variation in success before turning to the role of local politics and discussing my findings.

(a) *Measuring the dependent variable*

The dependent variable is each district's degree of success in promoting WUA, measured by the proportion of WUA in the district which are considered effective. Unfortunately the Indonesian irrigation agency does not keep standardized assessments of the organizations.⁵ While the central irrigation agency does request that local offices conduct evaluations each year as part of the annual WUA contest, local irrigation officials do not have time, will, or resources to appraise each unit. With even a small district containing hundreds of P3A groups, evaluations are often limited to local officials' subjective observations.

Conscious of these constraints, I judged WUA effectiveness on four indicators drawn from literature on irrigation management (Garces-Restrepo, Vermillion, & Munoz, 2007; Mukherji *et al.*, 2009). The four indicators included: (1) ability of the groups to independently collect water user fees; (2) ability of groups to manage conflicts between farmers without reliance on government officials; (3) ability of groups to manage water distribution independently; and (4) the relationship of groups with the irrigation agency. Each of the first three indicators highlights an aspect of WUA organizational strength. I chose these indicators as they were relatively easily observable in a data-poor environment in comparison to some other possible indicators. For instance, officials and farmers could accurately comment on whether or not any water conflict within a group had been referred to irrigation officials or the local government within the past few years. In contrast, equitable distribution of water, another possible indicator, would rely on subjective evaluations due to the absence of clear monitoring data. Thus I chose to focus primarily on indicators which reduced the chance that evaluations would be subject to respondent bias.

The fourth indicator, the relationship of WUA with the irrigation agency, was designed to gauge the capacity for cooperation between state officials and farmer groups. As such, it relied on subjective evaluations from irrigation officials, agriculture agency officials, researchers, and farmer group leaders. Generally I found that this evaluation, at least on the district level, was consistent across all of my respondent groups. The only exceptions came from a few government officials who would offer a pronouncement that farmers and the

government worked well together, but upon further questioning most would admit they had painted too rosy a picture.

District irrigation and agriculture officials provided initial evaluations of the efficacy of WUA in their respective districts based on these four characteristics. The perspective of district officials was supplemented by evaluations from local researchers at Gadjah Mada University who have a long history of collaboration with the irrigation agency and promoting farmer welfare in the province. Beyond this, my own field visits and discussions with WUA leaders in all three districts informed my evaluation of success.

The three districts demonstrated a range of variation in these evaluations. WUA in Kulon Progo were relatively successful. Officials, researchers, and farmer leaders felt that all of the 10 GP3A could be considered effective, and many of the 240 P3A were also active.⁶ I rank Kulon Progo, then, as mostly successful. Bantul, on the other hand, is home to 35 GP3A units and 313 P3A units, but very few of them are effective along my measures. Thus Bantul is considered mostly unsuccessful at promoting WUA. Sleman experiences limited success. By and large, the 24 GP3A are not considered active. In contrast, the district has been repeatedly recognized in provincial and national contests as home to some of the most successful P3A in the country. That said, the successful groups are relatively few and have all taken part in recent training programs from the district irrigation agency; the vast majority of the 441 P3A groups are not considered active.

Thus we see three levels of success in participatory policy implementation within the same province: Kulon Progo as mostly successful; Bantul as mostly unsuccessful; and Sleman as experiencing limited success.⁷ Before discussing findings about the effect of the local political context on this variation, my comparative research design allows me to preclude five possible alternative explanations.

(b) *Alternative explanations*

First, many scholars have argued that collective action is shaped by resource system characteristics (Agrawal, 2002; Bardhan, 1993a; Uphoff, Wickramasinghe, & Wijayaratna, 1990). Among the most important factors for irrigation is location. Upstream users who have plentiful access to water generally find that collective action in resource management is not necessary. Downstream users, on the other hand, are compelled to activity in order to ensure their access to water (see Ostrom, 1990). Thus we might expect to see greater success in our two downstream districts, Bantul and Kulon Progo. In contrast, we see that one is successful, which the other is not. The upstream district, Sleman, on the other hand, experiences limited success. Thus the upstream–downstream dichotomy fails to adequately explain this variation.

Second, group size and clearly defined boundaries also shape the ability of groups to be successful (Fujiie *et al.*, 2005; Olson, 1965; Tang, 1992). In general, though, these characteristics are held constant among the three districts. Basic P3A can range from fewer than 10 members covering less than five hectares to over 600 members with a range of almost 200 hectares. Group size in each district is fairly uniform. In Bantul the average P3A covers 52 hectares, in Sleman the average area is 43 hectares, and in Kulon Progo the average area is just under 45 hectares. Boundaries between groups are also porous in all districts. Thus group size and boundaries fail to clearly explain the variation.

Third, the underlying assumption of neo-institutional economics is that scarcity drives institutional change (North, 1995), thus scarcity of resources, especially in the irrigation

agency, could be seen as an opportunity for irrigation officials to focus on building farmer capacity to manage irrigation. Multiple irrigation officials in all three districts argued that promotion of WUA emerged due to manpower shortages rather than any specific government policy push. Due to budget constraints, Indonesia's civil service was under a hiring freeze from 2011 to 2013. Limits on hiring in the irrigation agency, though, predate the freeze.

Potentially this could explain the variation in WUA promotion across the districts if discrepancies in the shortages corresponded with the dependent variable. This is not the case. According to officials, all three districts suffer from manpower shortages. Kulon Progo's irrigation office has seen a drop in the number of officials, most dramatically in field officers (*jurulair*) from 33 to only five. This has translated into greater reliance on WUA and collaboration between the agency and farmer groups (irrigation official, personal communication, Kulon Progo, July 28, 2011). Bantul's irrigation office faced a similar drop in the number of irrigation workers. While officials complain of the shortage, it has not translated into greater emphasis on promoting WUA (irrigation officials, personal communication, Bantul, February 25, 2011). Sleman faced similar constraints. In 2010, the Department of Water, Energy, and Mineral Resources that houses the irrigation agency had 192 employees, but more than half of them were over 50 years old and rapidly approaching mandatory retirement. Only 36 were under 39 years of age. In response, one official created a WUA training program, but his efforts were limited due to resource constraints; only about nine P3A per year could take part in the program (irrigation official, personal communication, Sleman, April 7, 2011). This was, arguably, the source of the district's success in the national P3A contests mentioned above. Unfortunately, though, the efforts did not spread throughout the district agency. Thus we see that resource constraints were constant across all three districts, and they alone fail to explain variation in the outcome of interest.

Fourth, changes in government policy may shape the effectiveness of the WUA (Ostrom, 1992). Even so, the national policy environment is held constant for all three districts. They all took part in the shifts in WUA promotion which occurred in the wake of the Asian Financial Crisis, including the World Bank-funded projects. The national water laws as well as central irrigation agency direction has been the same for all three districts.

A fifth possibility is that farmers in one district may have higher levels of informal organization, a rough indicator of social capital, which might be driving the observed variation (Evans, 1996; Ostrom, 2000). In these cases, though, we are able to hold the role of social capital relatively constant. Scholars have repeatedly referenced Indonesian farmers' capacity to organize for irrigation management (Bruns, 2013; Lansing, 2007). Indeed, Javanese farmers in the Yogyakarta area have a long history of informal organization for water management (Arif, 2009; FTP-UGM, 2006). In all three districts, farmers episodically organized to engage in activities like canal cleaning. This, though, did not mean that the local WUA was active and able to facilitate cooperation with the irrigation agency. Because this informal farmer activity, or level of social capital, was constant across all three districts, it also fails to explain the variation in outcomes.

These five possible explanations are summarized in Table 1. As shown, there is no clear correlation between any single explanation and the degree of district success in promoting WUA. The variation in success, then, draws from some other explanation (Slater & Ziblatt, 2013). In

Table 1. *District comparisons*

	Location on system	Avg. group size* (Ha)	Agency labor shortage*	Policy context & social capital	Share of agriculture in economy**		Water user associations
					Labor (%)	GRP (%)	
Kulon Progo	Downstream	45	Yes	Constant	52.6	23.4	Mostly successful
Bantul	Downstream	52	Yes	Constant	15.6	19.9	Mostly unsuccessful
Sleman	Upstream	43	Yes	Constant	20.4	12.9	Limited success

* Data drawn from respective district irrigation offices.

** Data from BPS (2013).

the next section I contend that it is conditioned on the local political context.

(c) *Local political context and WUA promotion*

Due to Indonesia's decentralization, district-level politicians hold great sway over the bureaucrats charged with implementing policies (Aspinall, 2014; Buehlher, 2010; von Luebke, 2009). Thus, I posit that if district politicians have strong incentives to focus on farmers as a political constituency, then they will exercise greater control over the irrigation agency, prompting better service, and therefore attaining greater success in promoting WUA.

The variation in political pressure felt by local politicians regarding agriculture is clearly represented by the proportion of each district's population involved in agricultural sectors. Table 1 presents these numbers. According to 2012 provincial data, over half of Kulon Progo's work force (52.56%) is employed in agriculture (BPS, 2013). This count may underestimate the number of farmers, as many employees in other sectors still maintain small farms. Irrigation officials in the district claimed that over 80% of the population was involved in agriculture activities (irrigation official, personal communication, Kulon Progo, May 10, 2011). The large proportion of farmers translates into electoral demands on district leaders. For instance, during the 2011 election for district head, each of the three candidates paid special focus to farmer issues. The candidate who won the election even visited a number of GP3A offices, as some GP3A leaders also serve as vote canvassers.

In contrast, both Bantul and Sleman's populations are rapidly shifting out of agriculture. Bantul's population is growing, with an increase of about 100,000 residents during 2000–10, with the majority of the growth being outside the agriculture sector. Farm land is being quickly converted from production into housing and other urban use. The share of agriculture in the local economy dropped from just under 24% of the district's Gross Regional Product (GRP) in 2010 to less than 20% in 2014. Only 15.63% of the local workforce remained primarily employed in agriculture in 2012. The district government is focused on promoting the communication sector, commerce, and services rather than agriculture (BAPPEDA, 2011).

Sleman's district government also has economic and policy foci outside of the agriculture sector. According to recent numbers from the Bureau of Provincial Statistics (BPS, 2013), the proportion of residents employed in the commerce sector (25.3%) and the services sector (24.6%) are both larger than agriculture (20.4%). Agriculture's contribution to the economy is slowly dropping, from 14.5% in 2006 to less than 13% in 2012. Housing Gadjah Mada University, Yogyakarta State University, and 27 other institutions of higher education,

the district has a heavy focus on the education sector. The current district chief comes from an educational background and does not list agriculture as one of his priorities for his term (2010–15). Instead, the district government is focused on education, health, and creating a stronger investment climate.

In both Bantul and Sleman, the relatively weak focus on agriculture in the economy has translated into a lack of political will to effectively promote good governance in water management and participatory programs in irrigation. Without political constraint on local politicians, they have little incentive to exercise authority over irrigation officials. Civil servants in the irrigation agency reported feeling very little pressure from the district government to focus on agricultural development.

Beyond economic signals, field interviews also indicated that farmers in Kulon Progo were better able to access their district government leaders than those in either Bantul or Sleman. Kulon Progo's *bupati*, or district chief, has long been interested in the needs of farmers (former irrigation official, personal communication, Kulon Progo, August 4, 2011). Part of this was due to the prevalence of agriculture in the local economy, but it was also due to social connections between the district chief and farmer groups. The chief for the two terms prior to the 2011 election, Toyo Santoso Dipo, was the son of farmers and lived within the boundaries of one P3A. The head of the local GP3A had also served as a vote canvasser, and his wife belonged to some of the same social organizations as the district chief's wife. Social ties gave farmers direct access to the local government.

Through this informal mechanism, the farmers of the area lobbied the district government to ask for financial assistance to support their GP3A organizations (farmer leader, personal communication, Kulon Progo, August 12, 2011). In response to the lobbying, the district government passed *Peraturan Bupati Kulon Progo, Nomor 54 Tahun 2009* (Kulon Progo District Chief Regulation, No. 54, 2009) which provides financial assistance for each GP3A in the district to the tune of five million rupiah (approximately 500 USD) per year. While GP3A generally rely on irrigation service fees from farmers as well as subsidies from the irrigation agency, there are a number of minor expenses where such funding falls short, especially since legal changes in 2006 created challenges for the GP3A to collect member fees (field notes, meeting between GP3A heads and irrigation officials, Kulon Progo, August 10, 2011). Assistance from the district government has become an important subsidy for the costs of farmer meetings as well as some of the expenses that leaders incur from traveling around the association.

Beyond financial support, the district chief also pressured local irrigation and agriculture officials to be responsive to farmers. At one point he was reported to have lectured civil servants on the merits of involving farmers in their work.

One farmer leader recalled his words at the meeting: “Don’t be afraid to talk to farmers about their jobs. I know don’t know as much about farming as they do, so I ask. You can ask them. I consult [farmer name]” (personal communication, August 12, 2011). Both farmers and irrigation officials explained that the political support has proved vital to the development and growth of Kulon Progo’s WUA. In contrast, officials and farmers in both Bantul and Sleman had little to say regarding the role of the district government in encouraging WUA development.

(d) Discussion

In these comparisons, then, it appears that political pressure facing local politicians was a major causal factor leading to Kulon Progo’s relative success in promoting WUA. This pressure was experienced through elections where promoting agriculture was a major issue, informal contacts from social networks, and lobbying by GP3A groups. When local politicians felt pressure to be responsive to farmer needs, they in turn cajoled and supported irrigation and agriculture officials to work closely with farmers in developing these organizations (see Lewis, 2014; von Luebke, 2009). This resulted in a relatively high proportion of WUA becoming effective.

The political stress placed on district leaders in Kulon Progo on irrigation issues has contributed to WUA development. In contrast, the lack of pressure in irrigation issues led Bantul’s government to place low priority on creating and promoting effective WUA. In Sleman low political salience of agriculture translated into poor performance in WUA promotion, with the important exception of the P3A training program, which grew out of the efforts of an individual irrigation official. Its effect, though, was limited as the rest of the agency failed to adopt the program. This is discussed in more detail in the next section.

This evidence suggests a few implications. First, in line with some of claims in the decentralization literature, pressure placed on local politicians can yield positive benefits (Aspinall, 2014; Faguet, 2004). Bureaucrats in Kulon Progo engaged effectively with farmer organizations. This was in large part due to a long relationship that the agency had working with farmers,⁸ but it was also developed in response to compulsion district-level politicians felt in agriculture issues. These local politicians realized that their agriculture-based constituencies were concerned about irrigation. The district head also knew, thanks to personal and political ties with farmer leaders, that he needed to pay attention to farmer demands. Because of this, he placed extra pressure and encouragement on local civil servants to work with farmers. He, and the local legislature, have also provided monetary support for the GP3A organizations, as well as provided forums for complaints. Thus the local political context contributed to the successful implementation of policy.

Second, resource shortages are important, but they alone are insufficient. The same holds for central government mandates for participatory management. Bureaucrats in all three locations experienced resource shortages. They were also legally charged with developing participatory organizations, especially in the years 1999–2006. Despite this pressure, only bureaucrats in one of the three districts engaged in WUA development. The remaining two districts carried out programs from the central government, but these programs failed to result in an effective relationship between farmer leaders and bureaucrats. They also failed to inculcate a commitment in farmers’ minds to the WUA. This led to frustration on both sides, as district 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 efforts to induce participation through training programs, “the longer we are trained, the stupider we get (*makin lama makin bodoh*)” (personal communication, Bantul, April 27, 2011).

Incentives of local irrigation officials, 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. Resource shortages coupled with policy mandates alone do not innovation make.

6. WUA SURVEY RESULTS

I now turn to test the efficacy of state efforts to promote WUA and better understand how agency–farmer interactions shaped participation. I do this through an original survey of P3A conducted in a single district, Sleman, wherein my unit of analysis is the P3A. In this section, I first discuss the choice of Sleman for the survey. Then I explain how I measured my dependent variable, WUA activity. I also briefly discuss the independent and control variables in the survey before presenting the results of my analysis. Finally, I conclude the section with the implications of these results.

My use of surveys and quantitative analysis suffers from a potential limitation in that it simplifies complex human interactions; thus statistical results may overlook or mask important contributing factors in the causal story. Being aware of this potential drawback, the discussion section below supplements these results with data drawn from interviews and field research. By combining the two, I provide a clearer picture of the effect of state efforts to strengthen WUA.

(a) WUA training in Sleman

As noted above, Sleman district has the unique fortune of being home to a string of relatively successful P3A organizations, at least in terms of placement in the yearly national contest. Every winner of the provincial P3A contest from 2007 through 2011 was drawn from Sleman district, and those which won went on to place well in the national contest.⁹ Even so, the vast majority of the WUA in Sleman were relatively inactive. Most of the active groups have been recipients of a recent training program of the irrigation agency.

The district official who developed the program explained the impetus of the scheme: “We are low on manpower... We can’t keep doing our jobs without the resources... so we have to turn to the farmers” (personal communication, Sleman April 7, 2011). Officials hoped that by training farmers to better manage their systems, the agency would be able to continue offering the same level of service provision with fewer employees. Training included multiple meetings with farmer leaders to instruct them on the legal capacity of WUA, organizational structure, how to write and implement rules, basic knowledge about infrastructure design and construction, and how to better access assistance from the irrigation agency. Outcomes of training meetings included establishing a leadership structure, drafting organizational rules, and creating a cropping plan. The training program continued from 2006 through 2010 when the irrigation agency shifted their focus from P3A to GP3A due to implementation of Law 38/2008, which transferred responsibility over the smaller organizations to the agriculture agency. Unfortunately, agriculture officials

in many areas across Indonesia were poorly equipped and less than enthusiastic to adopt programs working with P3A.¹⁰ As such, at the time of field visits and the survey, the irrigation agency no longer had the authority, and more importantly the budget, to facilitate the groups while the agriculture agency had yet to embrace its new responsibility over basic water user groups.

This provided an excellent opportunity to test the program's effectiveness. Anecdotally the irrigation agency's efforts seemed successful, but officials had yet to carry out any systematic evaluation of the WUA. With only 45 groups having received training, I could survey most of these organizations as well as a relatively similar number of groups which had not received the same training. In all, 92 WUA provided valid survey responses. 35 of them had taken part in the recent training program, while 57 had not. Among those which had not been a part of the training program, 22 groups reported having been trained at an earlier period. 35 groups stated that they had received no substantive irrigation agency training.

(b) Measuring WUA activity

I first needed to gauge the success level of individual P3A. The survey allowed me greater leverage to apply a standard measure of effectiveness across a broad variety of groups than the earlier qualitative study. Here I posed a series of questions related to seven indicators of WUA activity found in the literature (Garces-Restrepo *et al.*, 2007; Mukherji *et al.*, 2009). Three of these questions were directed at the same indicators of group success as in the qualitative comparisons: irrigation service fee collection, conflict management, and water sharing. These questions were supplemented with four other indicators. These included whether the group independently maintained the canals in their system, whether the group coordinated cropping patterns, and whether the organization had a set of written rules. I also included a self-evaluation in which the group leader declared whether or not he felt the group was active. Each of these responses was coded into a binary variable, with a one reflecting a positive response.

In order to measure the underlying latent variable, water user group activity, I conducted a factor analysis based on these seven indicators. The resulting predicted latent variable is labeled WUA Activity, which serves as my dependent variable in the following analysis.¹¹ Summary statistics of all variables can be found in Table 2.

(c) Independent variables

I used three variables to measure the efforts of the state to promote WUA. The first was a binary variable indicating whether or not the group had been part of the training program conducted in the district from 2006 through 2010. The second was another binary variable indicating that the P3A had taken part in earlier training programs but not those conducted after 2006. Some of the groups which had earlier training also took part in the later training program, but I removed these from this measure. This variable, then, captures only those groups which had been trained exclusively prior to 2006. If training programs are effective, then we should see that these variables have positive relationships with WUA activity. A third variable was also used, which indicated the frequency of contact that the group had with irrigation officials. This was a categorical variable with increasing frequency, from less than once a year to regular monthly contact. Frequency of contact was not coterminous with training, but it allowed me to measure the strength of the relationship between irrigation officials and the WUA. I expected that this relationship should be positively related to group activity, following the theoretical predictions discussed above (Lam, 1996; Tendler, 1997).

Drawing on Agrawal (2003), I included set of control variables which could have an effect on collective action. First, I included continuous measures of group size, gauged by both land area (in hectares) and membership numbers. From these numbers, we can see that the size of P3A in my sample ranged from 10 farmers to just over 600 farmers, with an average membership of 72 farmers. Area-wise, the groups ranged from four hectares to 180 hectares, with an average size of just under 37 hectares. This is about six hectares smaller than

Table 2. Summary statistics

	Obs.	Mean	St. Dev.	Min	Max
<i>Dependent variables*</i>					
Do you consider the WUA as active?	90	0.833	0.375	0	1
Does the P3A regularly clean canals?	91	0.923	0.268	0	1
Does the P3A coordinate cropping patterns?	90	0.267	0.445	0	1
Does the P3A manage water rotation and sharing?	91	0.835	0.373	0	1
Do at least 70% of P3A members pay water fees?	85	0.424	0.497	0	1
Is the P3A able to manage farmer conflicts?	90	0.944	0.230	0	1
Does the P3A have written rules?	89	0.517	0.503	0	1
WUA Activity (predicted latent variable)	80	0	0.739	-1.69	0.987
<i>Training variables</i>					
Training (2006–10)	92	0.380	0.488	0	1
Other training (pre-2006)	92	0.239	0.429	0	1
Frequency of contact with irrigation officials	90	3.10	1.218	1	5
<i>Controls</i>					
Area	91	36.984	28.921	4	180
Membership numbers	90	72.289	82.522	10	603
Geography	87	0.713	0.455	0	1
Crop type	90	0.200	0.402	0	1
Water scarcity	89	1.292	0.527	1	4

* These questions have been simplified to fit this table. Actual survey questions varied slightly.

the average P3A group size reported in Table 1. I expect that these variables would be negatively related to WUA activity, as smaller groups should mobilize more easily (Olson, 1965).

Second, a geographic variable indicates whether the group is located on the mountainside or on the lowlands. This was a binary measure; groups in mountainous terrain scored a zero, while those on the plains or lowlands scored a one. The average score for this variable (0.713) indicates that the majority of the groups surveyed were located on the plains. I expect a negative sign from this variable, as Sleman is an upstream district and relatively water-rich. Thus, farmers on the plains have little need for collective action. In contrast, mountainous environments require collective action to reduce water losses from run-off, thus farmer groups would have greater incentives for collective action (Lam, 1996; Lansing, 2007).

I also included a measure of the types of crops cultivated by the group in order to gain information about the homogeneity of group interests. This was a binary measure, with a one indicating that the group relied exclusively on rice. A group receiving a zero score cultivated a mixture of crops, which in many cases included rice. The average score (0.200) indicates that most of the groups surveyed had a mixed cropping profile. Relatively few of the groups cultivated rice exclusively. I have no clear expectation about the effect of this variable, although we know that divergent interests may make collective action more difficult (Agrawal & Gibson, 1999). On the other hand, mixing crops may give farmers a greater incentive to coordinate cropping patterns and water sharing.

Water scarcity was the last control variable. This was a categorical variable wherein the P3A reported the amount of water available, lower values indicated abundant water and higher values indicated water scarcity. Here, the average score is 1.292 meaning that the P3A surveyed generally have sufficient access to water. I am agnostic as to the expected effect

of this variable, as many scholars have found cooperation is difficult in both situations of extreme water scarcity and extreme water abundance (Agrawal, 2002; Bardhan, 1993a). Thus the effect may be curvilinear (Araral, 2009).

(d) Findings and discussion

On order to assess the effect of training on group activity, I ran five regression models using these data to test the effects of the three independent variables of interest. In the first model, I included all three independent variables as well as the control variables. The second model removed the control variables. The last three models include all the control variables but tests each one of the training measures independently in order to separate out their effects. The linear regression results can be found in Table 3.

The regression results present a few interesting findings, which are summarized in Table 4. Initially we can see that only two of the control variables have significant effects. In the sample it appears that groups located in the plains are less active than their counterparts in mountainous terrain. This follows with the logic noted above that the steep slopes require more frequent collective action among farmer groups in order to prevent a loss of fast-flowing water. Additionally, groups which engage in mono-cropping rice are less active than those which cultivate a wider variety of crops. This effect is likely due to the fact that mixed cropping patterns require better coordination regarding water distribution. The effect may also emerge from the fact that those who monocrop rice are in areas that have abundant water, which means they have little impetus to coordinate. Water Scarcity, which maintained a consistently positive sign, albeit not statistically significant, offers some weak support for this supposition, but the conclusion is subject to further testing. The other control variables do not appear to be significantly correlated with WUA Activity.

Table 3. Regression results on WUA activity

	Model A	Model B	Model C	Model D	Model E
Training (2006–10)	−0.030 (0.168)	−0.090 (0.193)	0.287* (0.144)		
Other training (pre 2006)	−0.180 (0.201)	−0.433** (0.199)		−0.204 (0.198)	
Frequency of contact	0.200*** (0.067)	0.228*** (0.074)			0.200*** (0.058)
Area	0.001 (0.003)		0.002 (0.004)	0.003 (0.004)	0.001 (0.004)
Membership size	−0.001 (0.001)		−0.001 (0.001)	−0.001 (0.001)	−0.001 (0.001)
Geography	−0.366** (0.161)		−0.413** (0.162)	−0.449*** (0.162)	−0.374** (0.158)
Crop type	−0.499** (0.210)		−0.570** (0.226)	−0.474** (0.231)	−0.566*** (0.195)
Water scarcity	0.085 (0.122)		0.005 (0.150)	0.058 (0.154)	0.094 (0.120)
Constant	−0.210 (0.278)	−0.651** (0.245)	0.349 (0.227)	0.409 (0.242)	−0.266 (0.275)
N	71	79	72	72	71
R-squared	0.399	0.231	0.315	0.297	0.390

Robust standard errors in parentheses.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

Table 4. *Expected and observed coefficient signs of independent variables*

Independent variable	Expected sign	Observed sign
<i>Variables of interest</i>		
Training (2006–10)	Positive	Mixed
Other Training (pre 2006)	Positive	Negative*
Frequency of Contact	Positive	Positive**
<i>Controls</i>		
Area	Negative	Positive
Membership size	Negative	Negative
Geography	Negative	Negative**
Crop type	No Prediction	Negative**
Water scarcity	No Prediction	Positive

“Mixed” indicates that the variables had different signs in different models.
 *Statistically significant at 0.05 level in one model.
 ** Statistically significant at 0.05 level in multiple models.

Moving on to the variables of interest, we can see that the two training variables did not seem to have as strong an effect as one might have hoped. While in Model C, we did see a significantly positive effect from taking part in the recent training program (2006–10), this effect disappears when paired with other measures of training. The positive result is heartening, in that it seems to support the idea that training can be beneficial (Ricks & Arif, 2012). Even so, the relationship between training and WUA activity is weaker than that found among other variables, and its direction was reversed in other models.

On the other hand, in Model B we see that having been trained before 2006 actually has a significantly negative effect on WUA activity, contrary to expectations. The significance disappears in other models, but the effect remains negative. This result, though, is in harmony to some of the findings from field visits. For instance, leaders in one WUA, which been part of a training program many years previous, explained that the organization was established at the behest of the government. Their training had only involved the establishment of the group and writing a basic set of group rules. Since that time, they had received relatively little support from irrigation officials. The farmer leaders related that they saw very little need for a WUA and that it existed primarily on paper. They only

used the group name on rare occasions when filing paperwork with the irrigation department. When I asked them their feelings regarding the switch of authority over P3A from the irrigation department to the agriculture department that had occurred three years previous, the farmers had not yet heard of the transfer, indicating the lack of contact which they experienced with irrigation department personnel (farmer leaders, personal communication, June 24, 2011). The farmers also seemed to harbor feelings of resentment or distrust toward the irrigation agency as they felt the training programs were only conducted to serve officials’ needs rather than those of farmers. The early training program was thus ineffective and perhaps even counterproductive.

In contrast, frequent contact between irrigation officials and the WUA has a strong positive effect on a group’s level of activity. This relationship held strong across all three models that included the variable. Frequent contact between irrigation officials and the WUA became the single most significant predictor of group activity out of any of the variables in the analysis. The substantive effect can be seen in the scatterplot drawn from Model A in Figure 1. Here the predicted values of WUA Activity for each of the P3A are plotted according to their level of contact with irrigation officials; a line of best fit has also been drawn through the data. This graphically represents the finding that if a group is contacted at least every few months by state officials, the WUA is much more likely to be active than those which receive only semi-annual or yearly contact.

What do these results mean for the effect of state efforts to promote WUA? Training programs are often not effective at building WUA. Even among well-intentioned projects, training does not build the close relationships necessary for farmer–agency interaction. Indeed, one-off training projects may actually be detrimental to the relationship between farmers and the agency, as farmers feel that they are being used or patronized rather than becoming equal partners in management.

Short-term training programs tend to focus on making the organizations legible to the state, which in this case meant establishing a formal set of rules. These rules may not always be enforced, even in relatively successful groups (farmer leaders, personal communication, Sleman June 24, 2011; field

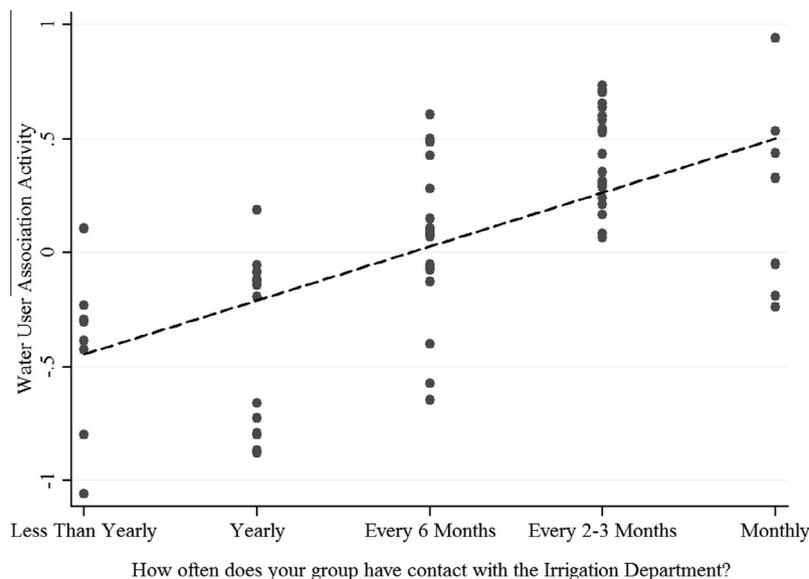


Figure 1. *The effect of frequency of contact on WUA activity.*

notes, GP3A leadership meeting, Kulon Progo August 10, 2011), but their existence legitimizes groups in the eyes of the state. This holds true not only for Sleman, but all three districts under consideration. In one case, a GP3A which was being considered for the provincial contest had a strong set of rules, but during an interview, a farmer leader confessed, “we have rules. . . but they are not enforced (*tidak jalan*)” (personal communication, Bantul April 27, 2011). Rule books are a way that irrigation officials are able to report to their agencies that they have implemented a participatory policy, a strategy harkening back to implementation of the 1987 policy (Bruns, 2004). Reflecting the perennial appeal of this approach, officials within the agriculture agency who were now in charge of developing the P3A claimed that their main focus for WUA promotion was to record a body of laws for each group (agriculture official, personal communication, Sleman, June 22, 2011). Thus, the institutions which emerge from training programs are often reflections of incentive structures within the agencies rather than the organizations farmers need.

Instead of training programs, regular contact between irrigation officials and farmer leaders serves as a more effective way to build strong WUA (Lam, 1996; Wade, 1992). Again, the qualitative field visits provide an indication as to why this matters. Regular interaction between irrigation officials and farmers reduced the transaction costs for information sharing. When irrigation officials frequently meet with farmers, they create an opportunity to exchange knowledge with farmers. Such information flows convince farmers of the utility of the groups. They also facilitate the efforts of the irrigation department, as they are able to gather greater site-specific information more efficiently than through their own observations. Active groups reported that irrigation officials and agriculture extension agents regularly attended their group meetings (field notes, Sleman, May 27, 2011; communication with irrigation official, Sleman, June 9, 2011). In fact, in Kulon Progo where farmer groups are the most active among the three districts considered here, irrigation officials hold a meeting with GP3A group leaders as well as representatives from the agriculture agency and the regional planning agency at least twice a month (irrigation official, personal communication, Kulon Progo, May 10, 2011). This frequent meeting was seen as key to the close relationship between farmer groups and the irrigation agency. Regular contact with state officials provides both the incentives and the tools to farmers to develop an active organization which benefits all involved.

7. CONCLUSIONS

These findings provide important insights about how local conditions shape the implementation of participatory policies. First, drawing on an original survey of 92 WUA, we see that the frequency of contact between state officials and farmer groups is much more important for the success of the group than training programs. Qualitative interviews complemented this finding. This result challenges the use of training programs to promote local organizations for participatory management, a common strategy in many developing countries (Geijer, Porton, & Smith, 1994; Mansuri & Rao, 2013). The data even suggested that some training efforts have been counterproductive. Without regular contact between officials and service recipients, efforts to implement participatory policies based on training programs will be of little or fleeting effect. This highlights the importance of socially embedded street-level officials both in irrigation (Lam, 1996, 2001; Oorthuizen,

2003; Suhardiman & Giordano, 2014; van der Zaag, 1992; Wade, 1992) and in other sectors (Edmonds, 2002; Evans, 1995; Tandler, 1997). Beyond this, the finding provides empirical support for Suhardiman and Giordano’s (2014) recent call for greater focus on farmer–agency interactions. Frequent contact between officials and farmer groups does appear to improve participatory outcomes.

Second, we see the important role of local politics in determining the success of participatory policies. While bureaucracies can often encompass negative incentives that hinder close ties between officials and service recipients (Lam, 1998; Molle *et al.*, 2009; Ricks, 2015), those negative incentives can be overcome through local political conditions (see also Bruns, 2013). These findings show that participatory policy implementation, especially in decentralized systems (von Luebke, 2009), is a dynamic affair. Farmers in Kulon Progo were able to demand assistance from the district chief due to the local importance of agriculture as well as social and political ties. The district chief, in turn, backed the development of WUA through providing financial support to the groups as well as pressuring state officials to be responsive to farmers. In contrast, in both Bantul and Sleman districts, local governments felt little demand from farmer groups and thus placed little emphasis on developing participatory irrigation management institutions. This allowed the irrigation agency to follow its own internal initiatives. These findings demonstrate that, under the right political context, farmer groups are able to affect policy implementation and service delivery (Mollinga & Bolding, 2004; Rosser *et al.*, 2011). While at the national level these appeals may be diluted (Suhardiman, 2015), I suggest that local-level demands from service recipients should be an important consideration in our examination of participatory policies. Researchers should be aware of the potential for local mobilization and engagement during the policy implementation process.

Of course, the data here is drawn from a limited geographic region in Indonesia. The generalizability of these lessons, therefore, remains contingent on further testing. Even so, these findings demonstrate that the state can create active WUA, suggesting the success of participatory organizations for common pool resource management may have less to do with whether they are top-down or bottom-up and more to do with the local context and politics of implementation, especially in decentralized systems (Pressman & Wildavsky, 1984). Unfortunately, political contexts like those found in Kulon Progo, where demand from service recipients helps drive policy implementation, are relatively rare (Ricks, 2015; Winters *et al.*, 2014). This has a rather sobering implication that we might expect participatory policies to repeatedly fail except in extraordinary cases where the ambitions of a local politician align with the goals of the policy. Relying on such sporadic success does not make for satisfying outcomes.

As such, these findings imply that one of the major challenges in participatory management is changing the way that state agencies monitor, evaluate, and reward the actions of their street-level officials. Rather than fixate on budget cycles and easily measured results, such as how many groups have a written body of rules, incentives must be developed for bureaucrats to engage with the intangible aspects of institutional development. Policy makers and officials in irrigation agencies would be better served by focusing less on a project or program-based approach with specific start and end dates and concentrating more on encouraging their local officials to meet with farmer groups regularly. An awareness of the role of frequent contact on WUA success can serve to increase the effectiveness of participatory policies.

NOTES

1. Increasingly scholars are highlighting the politics of national participatory policies, showing that politicians have relatively few incentives to shape these policies to reflect the needs of farmers. [Suhardiman \(2013, 2015\)](#) and [Bruns \(2004\)](#) have both emphasized this point in relation to Indonesia. Scholars have similarly highlighted these issues in Mexico ([Rap, 2006](#)), Nepal ([Lam, 1998](#)), India ([Mosse, 2003](#)), and the Philippines ([Araral, 2005](#)), among others ([Mollinga & Bolding, 2004](#); [Suhardiman et al., 2014](#)).
2. While the decentralization process resulted in some early concerns that district-level accountability would be lost due to corruption ([Aspinall & Fealy, 2003](#); [Hadiz, 2004](#)), recent work by [Aspinall \(2014\)](#), [Kis-Katos and Sjahrir \(2013\)](#), [Lewis \(2014\)](#), [Rosser, Wilson, and Sulistiyanto \(2011\)](#), and [von Luebke \(2009\)](#) has demonstrated that vertical accountability mechanisms are become increasingly important in determining service provision at the district level in Indonesia, and “voters are now more powerful than at any other time in Indonesian history” ([Buehlher, 2010, pp. 273](#)). [Lewis \(2014\)](#) further argued that the reason for continued poor service delivery is not one of a lack of accountability but instead a lack of citizen demand in key sectors (see also [Winters et al., 2014](#)). Pairing these arguments with my own field observations, I contend, despite the presence of corruption, district heads who experience pressure from citizen groups do respond with policy shifts.
3. The 2004 Law was declared unconstitutional by the Constitutional Court in February 2015, reinstating the prior 1974 law.
4. World Bank WISMP appraisals were based on 18 key indicators, with six related to participation in irrigation management including: the number of integrated water user groups (GP3A) that had been legally established in each project area; the amount of contributions to system maintenance drawn from farmer irrigation fees; women’s participation; transfer of tasks to water user groups; training of district irrigation departments; and sustainability of operations and maintenance budgets. World Bank documents, though, state that evaluations of WUA were primarily qualitative in nature, “due to lack of systematic monitoring and evaluation data” ([World Bank, 2012, pp. 18](#)).
5. The most recent nation-wide evaluation of WUA occurred in 2004, but irrigation officials in Jakarta hesitate to use the data, as they do not believe it is accurate. They complained that data collection efforts were difficult, and many districts and provinces either failed to report information or provided only partial information. In private communications, the officials also admitted that, dependent on the province, much of the data were likely falsified.
6. Previously there had been 13 GP3A, but some of the organizations recently merged.
7. In evaluations, I only rely on my four indicators. For instance, even though Kulon Progo was relatively successful, the district’s WUA still faced multiple challenges, including poor financial practices, disconnects between some farmers and WUA leadership, conflicts between P3A and GP3A over funding, weak coordination between GP3A, and continued reliance on the irrigation agency. For more details on the situation in Kulon Progo in the years prior to my research, see Chapter 7 of [Suhardiman \(2015\)](#).
8. This has some similarity to the findings of [Oorthuizen \(2003\)](#) in the Philippines and [van der Zaag \(1992\)](#) in Mexico.
9. In theory, the national contest involves standardized scores for each WUA in the country on organization, administration, finances, technical matters, and agricultural production. In practice, relatively few organizations are evaluated due to time and budget constraints. Evaluations tend to emphasize a close relationship with irrigation officials as well as formal aspects of the organization, such as written rules and irrigation service fee collection.
10. This was consistent across all three districts discussed here. P3A in other areas also complained that the agriculture agency was unprepared to work with them (see [Tribun Lampung, 2013](#)).
11. Factor analysis of the seven indicators resulted in only one factor with an eigenvalue greater than one, which also accounted for 77.5% of the variance of the indicators. Applying the Kaiser rule, I kept the single factor. Using this statistic, I created a predicted latent variable. As predicted variables are continuous and unbounded, they also include negative numbers. This does not mean that WUA Activity was negative; it merely serves as a continuous statistic across a range of activity levels. As an alternate measure, I repeated this analysis using an index variable created from the seven indicators. The results differed in relation to only the Crop Type variable, which lost its significance across all models. Otherwise the results were consistent with those presented here. Results are available from the author upon request.

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