From Voice to Empowerment: Rerouting Irrigation Reform in Indonesia

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Abstract: Indonesia's 1987 Irrigation Operation and Maintenance Policy introduced a series of efforts to improve irrigation management through increased farmer participation. Small schemes were to be transferred to water user associations, while in larger schemes irrigation service fees were to be introduced through participatory institutions and operation and maintenance made more efficient. In 1999, amidst dissatisfaction with the results of earlier efforts, the Indonesian government proclaimed a new irrigation reform policy aimed at farmer empowerment. This paper analyzes the dynamics of reform over the twelve years between these policies.

Robert Repetto's 1986 paper, "Skimming the Water: Rent-Seeking and the Performance of Public Irrigation Systems" analyzed how rent-seeking interests have dominated irrigation development in countries around the world. Irrigation agencies, political leaders, farmers, and construction interests benefit from and seek to expand subsidized construction. Farmers receive valuable water while paying little or nothing for it. Economic rents, the difference between the cost of water and its marginal value to farmers, become capitalized into land values, with farmers seeking to keep and expand the benefits of subsidized irrigation services. Within irrigation agencies, power and money are concentrated in construction, offering the best opportunities for career advancement, and personal enrichment (Chambers 1988). As long as centralized technical agencies control infrastructure operation and maintenance, they have little incentive to carry out maintenance (Ostrom, Schroeder and Wynne 1993). Underbudgeting of maintenance perpetuates a cycle of premature degradation and subsequent rehabilitation, reinforcing construction interests. The pragmatic response for officials in such agencies is to accept the pattern of deferred maintenance and rehabilitation projects (Levine 1986). Proposals to solve apparent economic inefficiencies through cost recovery, volumetric water wholesaling and irrigation fees paid to government frequently fail to recognize the dynamics of the institutional interests in irrigation (Moore 1989, Small and Carruthers 1991).

In Indonesia as in many countries, international donors funded centralized technocratic development of irrigation, in contrast to the local control of irrigation that prevails in much of the U.S., Europe and Japan. Centralized approaches were convenient for donors and national government agencies, and fit easily into technocratic, state-led development. Availability of international finance enabled agencies to subsidize projects and avoid the accountability that might have come with greater dependence on local resources. This process often overwhelmed and displaced local efforts to invest in improving irrigation. The participatory reforms initiated in 1987 offered Indonesian farmers greater voice in irrigation management (Paul 1992, Hirschman 1970), but, as this paper shows, offered little choice to exit from the dominant patterns of agency-controlled development in irrigation.

The first section of this paper outlines Indonesia's 1987 irrigation reforms through which the government, with support from international donors, sought to increase farmer participation in irrigation management. The discussion focuses on the case of irrigation management transfer under World Bank-funded projects. The second section analyzes how the set of interests that supported and benefited from irrigation construction reshaped reform efforts, and the persistent dynamics of a construction-driven approach to irrigation. Sustainability of reforms was endangered by the one-sided emphasis on reducing old government roles, and inadequate attention to developing the dynamics necessary to sustain new institutions. Beginning in the late 1990s, a second round of efforts to reform irrigation and water resources management was introduced in the context of ambitious efforts to restructure Indonesia's governance institutions. The third section describes the key principles of second phase of reforms and how they sought to escape problems that derailed earlier reforms.

CONTEXT: THE 1987 IRRIGATION OPERATION AND MAINTENANCE POLICY REFORMS

Since the beginning of Indonesia's New Order government in the mid-1960s, national irrigation policy focused first on rehabilitation, and then on expansion and construction of new schemes (Varley 1989). Oil revenues and international loans financed government intervention to increase agricultural production. Projects controlled by the central government were the major vehicle for government intervention in irrigation. From 1968-1993 about $10 billion was invested in irrigation, about 70% of which was financed by external loans, building and improving public schemes irrigating about 5 million hectares (Varley 1999). Donors made money available for construction and rehabilitation projects executed by Directorate General of Water Resources Development (DGWRD) in the Ministry of Public Works (MPW).

Irrigation development was a core part of efforts to achieve national self-sufficiency in rice production. Even in relatively well-watered western areas, such as Sumatra and west Java, irrigation helped expand second and third season crops, as well as reducing losses due to dry spells in the wet season. On parts of Sumatra, Kalimantan and Sulawesi, as well as in drier areas of eastern Indonesia, construction of irrigation schemes was also part of transmigration policies intended to move people from the islands of Java and Bali to other parts of the country.

The Ministry of Public Works and provincial irrigation agencies managed newly-built or improved schemes, including older locally-managed schemes incorporated into new schemes and rehabilitation works. Legally, government responsibility in government-built irrigation schemes extended all the way down to tertiary outlets and fifty meters beyond. Government's role in irrigation management expanded steadily even though by international standards most Indonesian irrigation schemes are relatively small, mostly less than 5,000 hectares in size, as shown in Figure 1. Even these categories are somewhat misleading since designated "irrigation areas" are often composed of multiple adjoining subunits with separate headworks, often linked by complex networks of supplementary canals. In addition to about 4.8 million hectares of government irrigation schemes, "village schemes," managed by local irrigation institutions and village authorities, cover an additional one to 1.5 million hectares of small systems.

Figure 1. Sizes of public irrigation areas

Size	**Systems**		**Area**	
	(number)		**(million ha.)**	
Small <1,000 ha	5,783	86%	1.65	34%
Medium 1,000-5,000 ha	814	12%	1.57	33%
Large >5,000 ha	133	2%	1.57	33%
Total	6,730		4.78	

Source: CID 1998, based on 1996 DGWRD Inventory

The fiscal crisis caused by the collapse of oil prices in the mid-1980s highlighted problems with construction oriented policies. That strengthened the voice of those in government concerned with the need for increased attention to operation and maintenance (O&M). Those involved included irrigation officials directly responsible for O&M as well as the Ministry of Home Affairs and provincial governments, concerned with broader objectives in public administration, and the National Planning Board (Bappenas) and the Ministry of Finance, concerned with efficiency of public expenditure. The cost of constructing new schemes was rising. Budget allocations for operation and maintenance were low. The performance of schemes in terms of area actually irrigated and benefits to farmers was often well below expectations, Degradation and need for rehabilitation much sooner than the expected lifetime of the infrastructure signaled the inadequacy of operation and maintenance.

International donors had become increasingly concerned about the lack of adequate operation and maintenance. The government's fiscal crisis increased the leverage of the World Bank and Asian Development Bank in policy dialogue, which resulted in the government's 1987 Irrigation Operation and Maintenance Policy (IOMP), issued as a precondition for the first Irrigation Subsector Project (ISSP-I) funded by the World Bank. As was usual at the time, preparation of projects and of the IOMP, was conducted as a secret (confidential) process between government and donors, without public consultation and with little publicity. The IOMP was designed as an integrated package of reforms to ensure adequate funding for operation and maintenance and improved irrigation management. The government committed to increase budget allocations for O&M, turn over small schemes to water user associations, establish irrigation fees, reform property tax administration, and mobilize more resources from beneficiaries. Implementation of the new policies was supported by the World Bank's Irrigation Subsector Project (ISSP-I) from 1998 to 1991, IISP II from 1991 to 1995 and then the Java Irrigation and Water Resources Management Project (JIWMP) from 1995 to 2001, as well as projects funded by the Asian Development Bank and other donors. Table 2 gives an overview of the principal programs carried out to implement the IOMP: turnover, irrigation service fees and efficient operation and maintenance.

*Turnover***.** The IOMP envisioned that over a period of about fifteen years all schemes smaller than 500 hectares would be turned over to water user associations (WUA). Initial emphasis was on schemes smaller than 150 hectares. WUAs were to be formally established and registered with district government. A modest level of funding, initially about US $100 per hectare, was provided

for repairs and improvements, with designs to be prepared in consultation with farmers (Bruns and Atmanto 1995, Vermillion et al. 2000).

*ISF***.** Irrigation service fees were introduced through a participatory approach, involving water user associations in identifying and prioritizing O&M needs and in collecting fees. In the approach developed at pilot sites, farmers had a voice in determining the O&M needs through joint walkthroughs, and through district-level consultative bodies composed of selected heads of WUA federations (Gerards 1995). Based on the scheme O&M budget, individual ISF charges were to be calculated by a formula based on the level of service received. Fees were to be paid into a bank account held by the district government, and used to pay for O&M done by the irrigation agency. Whereas before this budget was fully under the irrigation agency and its projects, the new arrangement created a potential "check and balance" intended to promote greater accountability (Paul 1992).

Table 2. Project activities to implement the 1987 Irrigation Operation and Maintenance Policies

	Institutions	**Finance**	**Construction**
Large schemes (>500 ha)	· WUA formation and development · Joint walk-throughs to assess O&M needs · District consultative bodies approve use of fees for O&M · Strengthening of agency O&M procedures (starting in "Advanced Operations Units") · Water User Training Program for officials and farmer leaders	· Central government subsidizes "special maintenance" (at a rate oi about $200/ha) · Salaries of permanent staff in provincial budget · Central government subsidies to provincial O&M budgets (~$20/ha) · Irrigation service fee (~$20/ha expected) · WUA still responsible for O&M of tertiaries · Strengthening of land and property tax for local government revenue	· Central government projects construct "special maintenance" works to improve canals and headworks, and O&M facilities (transport, communications, and buildings)
Small schemes (<500 ha)	· WUA formation and development · Consultation about design and construction of "special maintenance" works · Training on O&M (in the field, and sometimes formal) · Transfer of management	· Central government subsidizes "special maintenance" (~$100/ha) · WUA contributions to construction (mainly earthworks) · WUA responsible for subsequent O&M. · Possible government aid for later repairs if "beyond farmers' capacity," · Strengthening of land and property tax for local government revenue	· Central government projects construct "special maintenance" works to prepare schemes for turnover

*EOM***.** The Efficient Operation and Maintenance program (EOM) was supposed to ensure effective water delivery and adequate preventive maintenance, breaking the cycle of neglect and

premature rehabilitation. Maintenance budgets for government managed schemes were to be based on field analysis of needs. Donor-funded projects financed "special maintenance" to improve scheme infrastructure and facilities to the level needed for EOM. Loan funds subsidized O&M budgets in EOM schemes for a five-year transitional period, while loan conditions required maintaining adequate funding levels after loan subsidies ended. Improved O&M procedures were developed and initially applied in schemes selected as "Advanced Operation Units" (AOU). A large Water Users Training Project (WUTP) disseminated information about WUA and O&M to WUA leaders and government officials at all levels.

MISADVENTURES ON THE ROAD FROM POLICY TO PRACTICE

Attempts to institute participatory reforms challenged the network of interests among individuals, groups and organizations which benefited from construction-oriented approaches to irrigation development. This section analyzes several examples of how reforms were redirected during the process of translating new policies into practice.

Detours: Construction before turnover

The disappearance of category A. The turnover program was formulated to prepare for management transfer by carrying out design and construction of improvements in parallel with development of WUAs. For the working group of agency and donor officials that designed the program, minor construction works offered a way to interest farmers and give them meaningful participation in decisions. In the original formulation of the turnover program, schemes which had been included in the register of government irrigation schemes, were supposed to be gradually inventoried and classified into three categories:

A Schemes which had no government-built infrastructure. These could be "turned over" by just revising administrative records, or, at most, organizing a WUA to receive formal responsibility for the scheme
B Schemes with government-built infrastructure that had recently been improved, and so would need WUA organization, but no physical improvements, before turnover
C Schemes which had government-built infrastructure, and which needed physical improvements as well as WUA organization, before turnover

As the turnover procedures were developed in more detail in 1988 and 1989, DGWRD officials argued that all schemes should receive consideration as to whether they needed physical improvements before turnover. It was asserted that schemes which had never received assistance were often in worse condition than those that already had government-built infrastructure. Assessments of scheme "condition" emphasized physical hardware such as need for permanent dams and lined canals. Aiding schemes which already had more elaborate infrastructure, while not helping those with fewer permanent structures of stone and concrete, was portrayed as unfair.

Many schemes appeared to fall into category A as initially defined. Often farmers were unaware that the government considered them to be "government schemes." According to law, if there had been any government investment, then legally this made a scheme a "government"

scheme. Since O&M budgets were based on the area of "government schemes," irrigation agencies had a strong incentive to record as much area as possible as government schemes. Many areas were included which had never received government investment. In other cases, although government had funded construction works at some time in the past, the schemes were otherwise fully farmer-managed. All these schemes could have been rapidly "taken off the books," formally recognizing what was already true in practice, that they were de facto managed by farmers.

However, turnover would potentially reduce the flow of O&M subsidies, which in practice were mainly used for other schemes, or for occasional construction aid, not routine O&M (Murray-Rust and Vermillion 1989). The National Planning Board (BAPPENAS) had blocked DGWRD from involvement in project assistance to village irrigation schemes. Transferring category A schemes therefore also might have deprived DGWRD of the opportunity to be involved in future project assistance to these schemes.

In the end, procedures were revised so that schemes were first assessed according to their need for improvement. In all cases of schemes without government-built infrastructure (the original category A), the conclusion was that improvements were needed. Even recently-improved schemes (the original category B) were almost always found to be inadequate or incomplete, so that construction was needed. The outcome was that all schemes were judged to require construction. World Bank officials supervising the project acquiesced in this, seeming to feel they lacked the ability to influence this redefinition. The policy that turnover without construction was still possible in theory made it harder to argue against the change than if there had been an explicit decision that all schemes would have construction. Acceptance of the change may also have been due to the changes in the World Bank personnel involved with the project, lesser leverage in an ongoing project and the fact that this change would not threaten the disbursement of construction funds or achievement of formal project targets. The original design of the turnover process had involved a range of agencies, and donor organizations. However once implementation began, most decision-making was concentrated within DGWRD as the executing agency, and decisions came to reflect a narrower set of priorities. In hindsight this redefinition to make all schemes eligible for construction was a fateful first step in transforming a program ostensibly directed at strengthening O&M and local participation into a construction program.

Diversions. There was substantial contention about the appropriate level of improvement to be carried out before turnover. This was a major point of discussion among central and provincial officials implementing projects, and of discussion with World Bank project supervision missions. In many cases farmers were accustomed to building and repairing temporary headworks on their own to divert water into canals. However, many engineers in DGWRD and provincial irrigation agencies felt that permanent headworks were needed before turnover. They felt that it would be excessively burdensome to turn over schemes that required frequent reconstruction of temporary weirs. Counterarguments offered by some of the central officials involved in the program, consultants (including the author) and Bank missions, stressed that these were functioning schemes, and that usually farmers had been mobilizing to build and rebuild temporary weirs since the schemes were first built, in some cases generations ago. Arguments for building permanent weirs were framed in technical terms, usually with little attempt to compare costs and benefits.

Farmers wanted permanent weirs, particularly if the alternative they faced was between the possibility of getting a government-subsidized permanent structure for free, or continuing to

mobilize their own resources for frequent repair of temporary weirs. Farmers and agency staff had little problem agreeing on the desirability of using project loan funds, which neither had to repay, to build permanent weirs. After substantial debate, the conclusion was that the turnover program would generally not fund new permanent headworks, only repairs to existing structures or construction of semi-permanent (gabion) structures. In part this was driven by budgetary constraints, since the project lacked enough budget to fund many new headworks. Setting limits on budget items and declining to agree to changes was one of the few tools available to the donor agency and central officials. Funding was still allocated according to a per hectare average , roughly $100 per hectare. Sites requiring more than this were either excluded, or required additional justification through an economic analysis.

Cost sharing. Farmer cost-sharing was another point of debate during the World Bank's supervision missions for ISSP-I. Inclusion of a scheme in the program was basically a unilateral decision by government, not a choice by farmers or something negotiated based on their readiness to invest in improving the scheme. The issue of cost sharing was framed in terms of farmer "contributions," not as a matter of joint investment by farmers and government (Murry-Rust and Vermillion 1989). A commonly expressed view on the part of government and donor officials was that construction was an incentive to persuade farmers to accept turnover. Many agency officials felt requirements for local contributions would be difficult to implement and impose an unfair obligation on farmers, who were already being "burdened" with future responsibility for O&M. The conclusion was that farmers were expected to do earthworks. These local contributions were monitored, though attention to even this level of local "contribution" dwindled over time.

Construction before turnover. During implementation, farmers did gain a voice in making their suggestions about priorities and design of improvements (Bruns and Atmanto 1995, Mott-MacDonald 1993). Opportunities were increased for farmers to sell their labor and local materials during construction. WUA were set up that the government recognized as speaking for farmers. However the process was largely controlled by the agency, with little empowerment of farmers. The decision to carry out physical improvements before transfer constrained the pace and scope of turnover to the rate at which construction could be accomplished. Control of funds, and management of the design and construction process was in the hands of the agency, not farmers. Much of the time of senior government officials and World Bank staff supervising the project was focused on debating the need for permanent headworks, per hectare ceilings of the amount of contruction to be done, and farmer contributions to construction, which reduced the time available to attend to institutional issues.

Shortcuts to nowhere: Targeting WUA establishment

The turnover pilot program worked out procedures for organizing water user associations in pilot areas. These were supposed to start from the level of quarternary blocks, groups of 10-30 farmers. This approach was intended to build on local social relationships and be closely linked to farmers' involvement in prioritizing ways for schemes to be improved in preparation for turnover. Progress in WUA development was measured by the steps of formulating the WUA constitution and by-laws, choosing a slate of officers, and formal recognition of the organization by village, subdistrict, and district level authorities. Much of this process appeared to work

successfully during the pilots and initial implementation during ISSP I. However, organization of formal WUA was easily disconnected from substantive development of management capacity for irrigation operation and maintenance. WUA development often skipped the bottom-up organizing process, with WUA leaders instead appointed because of their relationship to village authorities. WUA constitutions and by-laws followed pre-printed examples, filling in a few blanks in these forms, rather than being based on thorough local discussion and genuine consensus. Project targets were met, in terms of organizations formed on paper. However, such paper organizations quickly became inactive. Commonly the essential tasks of pre-season maintenance and rotational water distribution during periods of shortage were still carried out by persons authorized by village officials, or informal mutual aid among farmers, rather than by the formal WUA.

Experience in the ISF program was similar. Initially the consultants guiding the pilot projects recruited community organizers who worked in the field to facilitate a bottom-up process of forming WUA. There was a stress on identifying local management problems and developing solutions, which often could result in more equitable water distribution and better mobilization of fees. However as the project expanded it focused on targets, particularly the number of WUA formally established. Success was measured in terms of payment rates for ISF, with little attention to whether there were improvements in irrigation performance.

WUA federations were formed which sometimes played a role in joint walk-throughs, but mainly were just a means to channel ISF to the district treasury. There was significant opposition within government to the idea of “community organizers” and deliberate avoidance of any approach which might foster large self-governing organizations, (such as that of Dutch polder management districts,) or otherwise allow significant organization above the village level. This fit the New Order regime’s approach of depoliticizing rural people and preventing the growth any strong organizations outside of the administrative command hierarchy, which ran all the way down to the village level. No forums were established at the scheme level for involving farmers in management. Formal arrangements for farmer voice were put into place, at least on paper. Over time even these tended to be neglected. It was argued that annual walkthroughs were unnecessary. District level consultative bodies often had little or no role in decisions. Later, interpretations of new regulations resulted in ISF funds being incorporated in the regular district budgets, and often not returned to the schemes where they were collected. ISF collections declined and only weak efforts to were made implement fee collection in areas nominally included under ISF.

Who steers? Projects and agencies

Initially, the irrigation officials responsible for O&M were given responsibility for implementing the turnover program. This combined their regular structural position as part of the provincial irrigation service with functional project responsibilities as subproject managers. They had knowledge about O&M problems, and better incentives to seek lasting changes, since they would be around to deal with problems later on. By contrast, most project staff had no responsibility after construction was complete, and usually soon moved on to other positions.

This policy changed during ISSP II, after a new Director General took charge and DGWRD was reorganized. Functional project responsibilities were split from structural positions, based on the principle that one person should only hold one position. This led to a situation where

most project managers came out of backgrounds in managing large construction projects. The cadre of officials who had been involved in starting the turnover program were excluded or had much less authority over implementation. This exacerbated the tendency to focus on easily measured targets of financial and physical progress of construction works, rather than institutional development. Managers for the provincial irrigation "projects" were appointed by DGWRD and oriented towards the national level, rather than the provincial irrigation agency. Project managers were in the driver's seat, not structural officials, and certainly not farmers.

Fuel: Money by the hectare

Funding for special maintenance works was planned on a per hectare basis, initially averaging about US $200 per hectare for larger schemes being prepared for EOM, and $100 per hectare for turnover schemes. While some relatively simple estimate of costs was needed for project preparation, planning based on per hectare rates was often carried through to the design process. It was usually not difficult to find ways to spend all the available funds within a scheme or package of several schemes. And there was a matching tendency not to prepare designs costing more than the average rate or ceiling. In theory more expensive works could be funded, long as an economic analysis was done and submitted to the World Bank for review. However, it was much simpler to keep under the limit, even if this meant parts of schemes were left incomplete or in poor condition. Farmers and structural officials in provincial irrigation agencies had a voice in identifying needs for improvement, but decisions were in the hands of projects which controlled design and construction works.

The term "special maintenance" itself had been created for ISSP I. Ostensibly there was only a need for relatively minor works to improve systems to be ready for efficient operation and maintenance. In practice the term avoided donor reluctance to fund rehabilitation, or to acknowledge that earlier construction had left many schemes unfinished and incomplete. As semantic manipulation this was quite successful. However the scope of activities was often little different from that covered by rehabilitation, just with less money. The package of IOMP reforms was also used to justify loan funding for O&M subsidies, albeit supposedly during a transition as ISF was phased in. However, ISF expansion was slow, and collection problematic. In practice, generous central government subsidies for O&M gave a contradictory signal that there was little need to be serious about collecting ISF, undermining the urgency of reforms. The center made up for declining allocations from the loan by increasing subsidies from its own resources. The central government exerted little pressure to increase local resource mobilization from ISF. Financial mechanisms continued to fuel old patterns of construction driven-development, and did not create new choices for farmers.

Potholes: Maintenance neglected

In combination, needs-based budgeting as part of EOM and the ISF program's participatory planning for O&M might have transformed how maintenance was planned and financed. A key attempted strategy was to build on farmers' interests in improving irrigation performance, either by transferring management to locally controlled WUA, or by using ISF payments and participation in identifying and prioritizing O&M activities to make management of larger schemes more accountable. However the approach was still primarily one of giving greater voice

for scheme level staff and farmers to express the needs they perceived. Control over expenditures was not shifted from the hands of irrigation project officials. While WUA representatives sat on the consultative bodies which authorized use of ISF funds for O&M, this was done at the district level, not for individual schemes, and did not include any authority over other parts of the O&M budget. While the Ministry of Finance may have been interested in reducing government expenditures on O&M, this was not an imperative for the other government agencies, which still benefited from controlling the flow of funds for O&M.

Over half the O&M funding was usually spent on staff, with a large contingent working on annual contracts. Of the remaining funds, most were spent on minor civil works to repair and upgrade schemes, e.g. lining canals, rather than on any systematic program of preventive maintenance. During ISSP I, procedures were developed and implemented for needs-based budgeting, inventorying the condition of irrigation infrastructure and compiling estimates for maintenance and repair work. However, after budget requests were proposed, the center and provinces still allocated budgets on the old per-hectare basis. This discouraged those who had put in time and effort to prepare detailed estimates. After a few years of trying needs-based budgeting with few useful results from their efforts, those responsible for preparing budget proposals usually reverted to the older, and much simpler per hectare basis. Provincial irrigation project officials retained their discretion over how to expend O&M budgets, including the tendering of construction contracts.

Needs-based budgeting was done separately from ISF introduction, not as part of an integrated package of reforms. The definition of needs made “needs-based budgeting” problematic. There were no clear standards for saying how much maintenance was adequate, or how to optimize maintenance expenditures in economic terms. Attention tended to focus on apparent needs for repair, and improvement, such as canal lining, rather than the more mundane tasks of routine and periodic maintenance. “Needs-based” estimates included the backlog of neglected maintenance, not just routine annual and periodic maintenance. This often resulted in estimates far in excess of available O&M funds. Even though schemes were already supposed to be in suitable condition for EOM, canal networks were often incomplete, many gates were in poor condition, and schemes often lacked equipment, such as motorcycles for transport, radios for communications, and other facilities.

O&M budgets were not controlled at the scheme level. Neither farmers nor scheme staff had power to choose what would be done. O&M staff at this level could make proposals, but the usage of O&M funds was managed through functional “O&M projects” set up at the provincial level. Sometimes the first time that scheme O&M staff knew that works had been approved was when contractors showed up to begin work. What was built often did not match priorities as perceived by staff within schemes. Often funds were concentrated into minor construction works, while more routine maintenance activities were neglected. This was both more convenient for those handling the budget and may have also allowed more opportunities for personal profit in awarding contracts.

During JIWMP, funding channels were changed so that central government subsidies for O&M were included in block grants provided to provinces, rather than going directly to budges controlled by provincial irrigation projects. Most central funds intended for O&M were placed under a general budget item, which provinces formally had authority to allocate to whatever

sector they chose. Provinces decided they had higher priorities in other sectors, so that actual O&M funding at the field level declined, even though on paper national budget allocations were being maintained. Maintenance was still treated as a "project" and transformed into minor construction. More mundane needs for routine and periodic maintenance still tended to be neglected in favor of adding canal lining, new division structures and other works that could be contracted out.

ROUTES TO RENEWAL

The 1987 IOMP reforms did not change the underlying dynamics of irrigation development. Government continued its role as an operator, directly implementing activities. Farmers gained some means for greater voice, but the system remained trapped in old patterns. Government sought to impose bureaucratic forms of WUA development, and was largely unable to tap the energies of local initiative. Construction was highly subsidized, with funds channeled through irrigation bureaucracies. Technical, financial, legal and organizational services to aid WUA were largely absent, except for government's own target oriented programs directly delivering conventional classroom based training. Under such conditions it was hard to expect WUA to survive, let alone thrive.

During the eighties and nineties various studies, workshops and seminars provided forums for discussing problems with WUA development. University academics and NGO workers helped suggest new approaches. The Ford Foundation supported many of these activities. Other donor projects also helped introduce new approaches, such as Dutch-funded efforts in the Cidurian scheme, the Madura groundwater projects supported by Britain, and the Small-Scale Irrigation Management Project in eastern Indonesia, funded by USAID and OECF. In many cases, government officials supported new ideas, and in private were highly critical of their own programs. However they usually felt unable to voice ideas which might upset their superiors, though sometimes outsiders could function as a channel for raising criticisms and alternatives. Over time views evolved.

By the time of the 1996 national seminar on participatory irrigation management there was substantial consensus among mid-level and many senior level officials about the shortcomings of current approaches, the need to effectively apply those principles which had been already been put into policy, and the importance of making more fundamental changes (Bruns and Helmi 1996). At an intellectual level, many battles had been won, even though in practice implementation during this period was often retrogressing, with institutional changes neglected in favor of more construction-oriented approaches. Despite disappointing events on the ground, the conditions had been created for a more drastic reforms, if senior officials were willing to consider such changes.

Changes in leadership of DGWRD and the Ministry of Public Works in 1998 opened up the possibilities for discussing institutional reforms in ways which could go beyond lip service. Advocates of top-down approaches were on the defensive, and possibilities appeared for major changes in irrigation management. Over the period of a dozen years, farmer empowerment went from something which could only be whispered about privately to something which was to be embraced as a major goal of national policy.

Reformation and decentralization

The end of the New Order regime in mid-1998 expanded the possibilities for institutional change. Passage of laws on regional autonomy in April 1999 laid the foundation for a major shift in power and money from the central government to districts. Criticism of previous waste, corruption and abuse of power brought wide acceptance of the need for greatly increasing transparency and accountability in the implementation of government programs. Change brought more willingness to put money and decision-making into local hands, though efforts to put this into practice also brought awareness of the risks of local corruption and abuse of power.

In 1997-1998 the Asian Development Bank had funded a technical assistance study on Options for Sustainable Irrigation Development in Indonesia. This clearly signaled the concern of this major donor for reviewing the direction of irrigation sector activities. Beginning in late 1997, the World Bank began increased dialog about the need for major reforms in the irrigation and water resources policy and institutions, as a prerequisite for any future lending in the sector. These efforts helped to draw high level attention from BAPPENAS, the Minister of Public Works and other senior officials. The results of the Asian monetary crisis and the new pro-reform atmosphere brought an increased sense of urgency to some of those involved.

The economic crisis also increased the leverage of the World Bank's offer to provide a sector adjustment loan to support reforms. Funds from the sector adjustment loans would be used for general budgetary support, but were tied to specific sector policy changes. In late 1998 and early 1999, an inter-agency working group led the formulation of ideas for reforms in irrigation and water resources policy. This drew on many ideas from earlier discussions and studies, notably a series of seminars organized by BAPPENAS which had included government officials, NGOs and academics. The working group also carried out public consultation meetings in Jakarta and several provinces. University experts helped the working group to synthesize and clarify key principles for irrigation reforms. The outcome of this process was agreement on a major program of reforms. In April 1999, a Presidential Instruction, and speech laid out the key principles of an irrigation reform program.

New directions: Reform principles

Presidential Instruction Number 3 issued on April 26, 1999, laid out five principles for irrigation reform: redefining irrigation institutions, empowering WUA, transfer and joint management, farmer-managed fees, and irrigation sustainability. These points had already been spelled out in more detail in a longer document written in Indonesian, which was used as a basis for reform discussions including officials from various agencies, universities, NGOs and donors. Reforms were also described in the formal documents for the Water Sector Adjustment Loan (WATSAL), between the Government of Indonesia and the World Bank, intended to support these policy changes, which was agreed in April 1999. The rest of this section discusses the five principles, corresponding elements of WATSAL, and some of the challenges involved in putting such reforms into practice.

Enabling institutions. The first principle of the Presidential Decree emphasized the need to rearrange the government agencies and farmer organization involved in irrigation management, so that farmers become decision-makers. Broader discussions about government reformation had emphasized the shift in government's role from provider to enabler, "from rowing to steering."

The WATSAL Policy Matrix indicated that change would occur at all levels, with agency roles focused on water delivery and WUA support services. One of the main issues in the discussion about this point concerned the need for a continuing government regulatory and advisory role in technical audit. This would address one of the shortcomings of the previous reforms, the lack of a supportive environment for WUA after turnover, including availability of specific support services and suitable regulation of water resources.

Empowering WUA. The Presidential Instruction outlined principles for a paradigm shift toward WUA which would not be imposed instruments of government, but instead autonomous, self-reliant and based in the local community. The Policy Matrix emphasized autonomous governance and financial authority for management. Subsequent points highlighted the transfer of management authority and new financial arrangements. This empowerment included formal legal status, the ability to enter into contracts and open bank accounts. Water rights would enable WUA to have a clear claim to water, and a basis to negotiate over water allocation, within schemes and at the basin level.

Management transfer and joint governance. The proposed reforms covered all schemes, not just those under 500 hectares in size. Management transfer was supposed to be "selective, phased and democratic." Not all structures would necessarily be transferred, e.g. major headworks might stay under government management, secondary canal areas might be turned over before the main system, different districts might move at different speeds, and the transfer should be chosen by the community of irrigators, not imposed. This was not a "big bang" policy. However, areas not yet transferred would be put under joint governance, not left for "business as usual." Scheme management forums for joint management would enable WUA representatives to make decisions about activities still implemented by agency staff. The reforms would cover all schemes, not just a subset singled out for special attention.

In the longer run, transferring governance authority over irrigation schemes would create the possibility of a choice among service providers (Vermillion 1999). While the irrigation network itself may be a natural monopoly, the management services to deliver water and maintain facilities could be delivered by a government agency, farmer-governed organization, or a private corporation. Management transfer thus could move beyond voice to empower farmers to control the services, including gaining a choice about whether they wanted to continue to obtain the services from a government agency, hire their own manager and staff, or perhaps contract for management services from a private concessionaire.

Fees from, by, and for farmers. The core of the new approach to ISF was to empower farmers to set, collect and manage fees themselves. This was intended to enhance legitimacy, make collective action more effective, and improve efficiency in the use of funds. Irrigation fees would be determined by WUA in each scheme, collected and managed by WUA. Payment would be obligatory nationwide, with enforcement supported by appropriate legislation at the national and district level. As discussed in the Letter of Sector Policy, further incentives for payment would be created by making eligibility for government aid conditional on satisfactory levels of local resource mobilization through ISF. Rather than just giving farmers a voice in a program still controlled by government, this approach would put choices, and responsibilities in the hands of farmers.

Farmers' responsibility for financing irrigation would include not just operation and maintenance, but also construction, rehabilitation and improvement. In discussions there was growing recognition that confining farmers' responsibilities to O&M would discourage preventive maintenance and undermine farmer investment in improving irrigation. The laws on regional autonomy passed in April 1999 envisioned radical fiscal decentralization. The challenge was then to institute new mechanisms for financing irrigation infrastructure, rather than just reproducing the same flawed top-down project dynamics at a lower level. An incremental approach to infrastructure improvement could be used to facilitate local control over construction (Bruns 1998). District level irrigation improvement funds were proposed as a basis for a demand-driven approach, responding competitive WUA proposals, transparently allocating from a limited pool of funds (i.e a hard budget constaint), and with WUA empowered to control design and construction decisions.

Irrigation sustainability. This point linked the irrigation reforms with other efforts to improve basin water resource management, improving institutions for managing water quantity and quality, including user participation in basin water management, water rights, control of water pollution from urban areas, and other changes. Rapid conversion of agricultural land to urban and residential use was reducing the area available for growing rice. There were no requirements or mechanisms for developers to compensate government for the value of irrigation infrastructure taken out of use by land-use conversion. Water was being transferred from agriculture to urban and industrial users without effective means for consultation or compensation of the affected farmers. WATSAL included commitments to establish a system of water rights covering irrigation and other agricultural water use, and improved regulation of water quality.

Experience over the twelve years between the 1987 Irrigation Operation and Maintenance Policy Statement and the 1999 Declaration on Irrigation Policy renewal illustrates some of the challenges faced by efforts to increase participation in the form of voice within agency-controlled irrigation development. New policies for WUA empowerment seek to institute a paradigm with very different assumptions about the role of the state and local organizations, promoting devolution, demand-driven development and sustainability. New policies, laws and regulations may create an enabling environment that renders such reforms possible. The combination of transferring governance authority to empower WUA and rerouting financing through decentralized irrigation improvement funds could restructure incentives and foster support for a new approach. However putting changes into practice will face many of the same challenges from the network of interests which has benefited from construction-driven irrigation development in the past. In their analysis of the turnover program impacts, researchers in the International Water Management Institute study noted the tendency of WUA to underinvest in maintenance after transfer (Vermillion et al. 2000). Even if water user associations and federations gain not just voice, but do actually take over more power to choose and decide, nevertheless escaping the attractions which have tended to trap irrigation in wasteful cycles of paternalistic development, deferred maintenance and subsidized rehabilitation will not be easy.

CONCLUSION: THE ROUTE FROM VOICE TO CHOICE

Indonesia's 1987 Irrigation Operation and Maintenance Policy introduced a series of efforts to transfer management of small schemes to water user associations, and to institute irrigation

service fees and improve the efficiency of irrigation operation and maintenance in larger schemes. The first Irrigation Subsector Project introduced participatory procedures for turnover of management to water user associations in small schemes. For larger schemes, the project piloted participatory collection and use of irrigation service fees, and introduced procedures for more efficient operation and maintenance. Farmers gained a voice in the design and construction of improvements made to prepare for turnover of small schemes. In larger schemes they were involved in identifying priorities for maintenance to be funded from irrigation service fees. The difficulties of expanding and institutionalizing reforms became clearer during the Second Irrigation Subsector Project. The Java Irrigation Improvement and Water Resource Management Project sought to continue the earlier reforms in irrigation operation and maintenance, amidst increasing concern about the need for more fundamental changes.

The 1987 reforms threatened the set of interests that supported and benefited from irrigation construction. These interests rerouted reform efforts, revealing the persistent dynamics of a construction-driven, rent-seeking approach to government activity in irrigation development. Donor-funded projects succumbed to a continuing bias towards construction. The decision to carry out physical improvements before turnover constrained the pace and scope of turnover to the construction program. Institutional development tended to focus on easily measurable targets for physical works and formal registration of WUA, in ways which often undermined the more fundamental objectives of reform. Project organization and agency career paths kept control in the hands of project managers oriented towards construction. Mechanistic development of water user associations produced paper organizations that quickly became inactive.

Sustainability of reforms was endangered by the one-sided emphasis on reducing old government roles, and fixing up schemes as a prerequisite for further changes. Without rights and power, irrigators' organizations lacked incentives and capabilities to organize themselves for better irrigation management. In the absence of new arrangements for financing civil works, subsidized patterns of rent-seeking and patron-client interaction between farmers and the bureaucracy persisted. Government withdrawal, without adequate availability of technical services, and with little regulatory oversight, invited neglect and declining performance.

In 1999, amidst dissatisfaction with the results of earlier efforts, the Indonesian government proclaimed a new irrigation reform policy, initiating major changes in strategy. These efforts to reform irrigation and water resources management were being formulated in the context of ambitious efforts to restructure Indonesia's governance institutions. The Indonesian government committed itself to strategic reform principles for redefining agency roles; empowering WUA; joint governance and management transfer; fees from, by and for farmers; and new approaches to financing irrigation. Reforms to empower farmers with genuine choices, not just a voice in centralized projects, sought to open new routes for effective change.

In terms of the transport metaphor used in this paper, the earlier approach to irrigation reform can be compared to the top-down construction of a centralized railroad system, monopolized by a single operator, powerful but restricted to a few destinations, dependent on detailed planning, and all too easily derailed. Reforms to empower farmers could be analogous to developing a flexible network, with many routes to reach diverse destinations, and a variety of vehicles; creating a process which could be driven by farmers, empowered with far more choices about directing their own development.

NOTES

The paper draws on the author's experience as a consultant on various irrigation projects in Indonesia since 1988, as well as reports and publications listed in the references. Among other assignments, the author worked on the turnover program from 1988 to 1991 as Institutional Advisor (funded by the Ford Foundation) for LP3ES' activities in the turnover program, undertook short-term assignments during the preparation and implementation of the Java Irrigation and Water Resources Management Project, and participated in World Bank missions for JIWMP project supervision and preparation of the Water Sector Adjustment Loan, The ideas presented here benefit from discussions with many people concerned with irrigation reform in Indonesia, including farmers and government officials at national, provincial, district and village levels, and many others, including Helmi, Sigid Supadmo, Ganjar Kurnia, Sudar Dwi Atmanto, Saleh Ali, Bambang Adinugroho, Douglas Vermillion, Scott Guggenheim, Robert Varley. and Theodore Herman. Views expressed in the paper are the responsibility of the author and do not represent those of any institution with which he is or has been affiliated. Comments are invited to: BryanBruns@bryanbruns.com

A longer version of this paper was presented at the December 1999 Conference on the Politics of Irrigation Reform in Hyderabad, Andhra Pradesh, India and is available at the author's website: www.bryanbruns.com. That version includes additional description of the agencies and projects, as well as more detailed analysis of the institutional dynamics of the IOMP reforms and proposed alternatives. Appendices to that version provide the text of the 1987 Irrigation Operations and Maintenance Policy Statement, and relevant sections from the Letter of Sector Policy and Policy Matrix for the Water Resources Sector Adjustment Loan.

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