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Correlations, Causes and the Logic of Obscuration: Donor Shaping of Dominant Narratives in Indonesia's Irrigation Development

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Correlations, Causes and the Logic of Obscuration: Donor Shaping of Dominant Narratives in Indonesia's Irrigation Development

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ABSTRACT *This article analyses policy trends in Indonesian irrigation, particularly during the last five decades, from the perspective of dominant narratives, as authored, suggested and pushed by international donors. It argues that international donors' adherence to 'deferred maintenance' as the core element of irrigation policy problem framing does not match with farmers' and the irrigation agency staff perceptions and practices. The logic of obscuration and the discursive manoeuvers that maintain it are analysed. The article concludes that there is space for more profound conceptual contestation and for alternative actions pathways even within the 'dominant paradigm' to address management problems more effectively.*

I. Introduction

International donors have played a significant role in defining policy problems in irrigation development in developing countries through the creation and sustenance of dominant narratives (Roe, 1994). From the late 1960s they have authored, suggested and pushed narratives upon which national irrigation policies of developing countries should be based. Taking Indonesia as our main case, we analyse, from a social constructionist perspective (Stone, 1989), donors' pre-eminent role in problem framing in and for irrigation policy. We investigate the framing of the 'irrigation question' by international policy elites, in interaction with national policy elites,[1] by looking at how policy ideas are created and sustained through narratives based on common sense, causal reasoning, and their political effects.

Hegemonic tendencies in policy formulation processes, including the way policy elites translate a 'difficult situation' into a 'policy problem', have been widely discussed in policy science literature (Edelman, 1988; Hilgartner and Bosk, 1988). As stated by Edelman (1988: 12), '[p]roblems come into existence, not simply because they are there or because they are important for well being. They constitute people as subjects with particular kinds of aspirations, self-concepts and fears, and they create beliefs about the relative importance of events and objects. Most importantly, they are critical in determining who exercise authority and who accept it'.

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Problem analysis in policy science has focused on four major themes: (i) the logical sequence in problem definition (what produced the problem? where did it come from?) (Dye, 1984); (ii) the characteristics of policy actors that define the problem (Gusfield, 1981); (iii) the use of language and symbols in shaping a problem's portrayal (Apthorpe, 1986; Edelman, 1988); and (iv) how problem definition is linked to the way policy-makers perceive available solutions (Wildavsky, 1979). In international development cooperation problem analysis tends to be (i) highly standardised, that is, internationally generated problem analysis is thought to apply to a broad range of situations, if not universally (Molle, 2008) and (ii) preoccupied by the desire to generate the 'right policy model', problem analysis tends to be strongly prescriptive (Mosse, 2004; Rap, 2006).

International donors' promotion of widespread adoption of international policy trends by developing country governments is a structural characteristic of development cooperation. Bauer (1972) and Easterly (2003) argue that these hegemonic tendencies are rooted in the misconceptualisation of unsatisfactory progress in development as a shortage of capital, to be remedied by donor loans and projects. Crewe and Harrison (1998) show how international development assistance is often made available based primarily on donors' perceptions, regardless of coincidence with national and grass roots development conditions, demands, interests and aspirations (also see Mosse et al., 1998).

In the last five decades Indonesia has undergone dramatic political changes: from Suharto's development-focused but repressive New Order (Jackson and Pye, 1980; Vatikiotis, 1998) to the upsurge of reform forces that led to today's imperfect but relatively vigorous democracy (Aspinall and Fealy, 2003; Schulte-Nordholt, 2003). Notwithstanding this political and organisational turmoil, the irrigation bureaucracy was able to preserve its sectoral prominence, identity and centralised power. This singularity of the trajectory of Indonesian government irrigation suggests several things. While the Suharto era might be read as a 'global dominance' example, the more recent events show the strength of the 'domestic' agency of the Indonesian irrigation bureaucracy independent of external influence. Together, this suggests an alignment of international and national policy elites around a modernisation project and institutional reproduction interests.

We do not attempt in this article to present a general political economy and development theory analysis of this configuration and its history. We focus on one dimension, the role of policy narratives in the reproduction of it, or alternatively formulated, its role in explaining the singularity of the Indonesian government irrigation trajectory. We do not claim that policy narratives are the 'key', 'basic', 'fundamental' or otherwise primary element of the structure that we describe. We do think it is of considerable causal significance, while it has not received much research attention in the irrigation domain, but it is no doubt only one of several determinations.

Our main point at this level of analysis is, however, a different one. The reproduction or transformation of the structure of which policy narratives are an element does not happen automatically, it has to be performed. In this performance there is often contestation – conceptual (cognitive) contestation, and contested decisions and choices for action pathways. We are interested to understand how donor shaped policy narratives, and the simplifications and discursive manoeuvers that are a part of them, have helped the reproduction of Indonesia's 'technical irrigation' (reform) policy trajectory over a period of five decades.

Towards the end of the article we discuss whether the stability of the policy narrative of Indonesian irrigation development could possibly allow alternative approaches to reform that are more useful to irrigators. This is a pertinent question as Indonesia's post-independence irrigation policy has failed to effectively address management problems in government irrigation systems, problems that translate into unsatisfactory productivity levels and distributional injustices. We observe a mismatch between, on one side, the dominant narrative underpinning Indonesia's irrigation policy, and on the other side, the actual perceptions and irrigation system management practices of farmers and the Indonesian irrigation agency staff. We will suggest that there is space for both more profound conceptual contestation and for alternative actions pathways even within the 'dominant paradigm'.

As such, this article is part of a broader attempt to understand and dislodge the unusual defensiveness of the irrigation, and more generally the large scale water infrastructure, government sector as regards incorporating into business-as-usual ecology, poverty alleviation and inclusive democracy perspectives – and, for that matter, new public management approaches to running a bureaucracy (cf. Mollinga and Bolding, 2004).[2] Theoretically, the broader concern is that structural and interest based explanations seem to be insufficiently equipped to capture this tenacity, while practically and politically the concern is that more precise investigation of the reproduction mechanisms may yield new entry points for enhancing reform. The article explores and illustrates these concerns through a case study of Indonesian irrigation reform.

II. International Donors and Dominant Policy Narratives in Indonesian Irrigation

For the colonial Indian context Stone (1984: 8) states that '[i]n its design, modes of operation, and intended effects, canal irrigation was ultimately a cultural expression, representing the priorities and aspirations of its western architects'. Indonesian concepts of 'modern' canal irrigation expressed the interests of Dutch colonialism, and some of the contradictions of that rule, notably the way canal irrigation for (colonial) irrigated sugarcane production had to be combined with (local) irrigated food crop production (Hofstede and Santbrink, 1979). The concept of 'technical irrigation' in Indonesia, as expressed for instance in Indonesian irrigation engineering textbooks (DGWRD, 1986) and stemming from the colonial period (Eijsvogel, 1949), embodies irrigation engineers' idealised perception of physical irrigation infrastructure as an instrument of (economic and agricultural) development. In the 'technical irrigation' perspective, an irrigation system can be managed only when it is equipped with appropriately (that is, by scientifically trained engineers) designed canal infrastructure, built for a (nationally) defined purpose. The 'cultural expression' of rule that government irrigation construction and management embodies is obscured in this scientifically framed instrumentalism of state led development.[3]

After independence state built/managed irrigation remained an important technology of rule (Lansing, 1991). The independent Indonesian government set out on a 'planned development' approach with irrigation development as a core feature. The global attempts of the 1970s to promote agricultural intensification programmes reinforced this and stimulated rapid technical development in the irrigation sector. Rooted in concerns about rapid population growth and fears of a 'red revolution' in developing countries (Anderson et al., 1982), the 'productive discourse' (Booth, 1988) marked the beginning of the 'green revolution' era, with, in Asia, the introduction of high yielding varieties of rice.[4]

In this post-independence context of planned development and agricultural intensification the colonial concept of 'technical irrigation' development was revamped to fit new conditions. The policy narrative that emerged was a variant of what Allan (2006) has labelled the 'hydraulic mission' perspective. It involved a focus on infrastructure development and water supply enhancement for achieving the objectives of national economic development as defined by the state, and supported by international donors discursively and financially.

International donors' strong influence in shaping Indonesia's irrigation development originates in this era. In the late 1960s the World Bank started with the PROSIDA (Irrigation Project from International Development Agency) as Indonesia's first foreign funded irrigation infrastructure development project (NEDECO, 1978). With ongoing support from the Bank, PROSIDA continued until 1989 and became the country's largest and most prolonged project undertaking in irrigation infrastructure development. Investment in irrigation infrastructure grew dramatically through the first three Repelitas (Indonesia's five years development plans from 1969 to 1983) supported by a series of foreign loans packages (Pasandaran and Rosegrant, 1995).

Indonesia's post-independence irrigation policy trajectory has different phases, mainly defined by shifts in international approaches to irrigation, leading to a succession of national policy approaches. However, Indonesian irrigation policy exhibits considerable consistency over time as

regards its 'hydraulic mission' characteristics. The infrastructure orientation established in the first decades after independence has been maintained across the subsequent internationally induced and enforced policy shifts, and has not been undermined by the lack of improvement in irrigation system performance achieved by the irrigation policies in each of the phases of the trajectory.

Operation and Maintenance

In the 1980s, the global policy emphasis in irrigation development shifted from a focus on infrastructure construction towards systems operation and maintenance (O&M). This shift coincided with a decline in the international prices of major irrigated crops and an increase in construction costs (Turral, 1995). In the O&M approach, international donors defined 'deferred maintenance' as the core problem in government managed irrigation systems worldwide. Observing rapid deterioration of irrigation system infrastructure, donors considered that government irrigation systems performed poorly because of this (World Bank, 1986): DM (deferred maintenance) → PP (poor performance).[5] Inversing this assumed causality, irrigation development was focused on attempts to preserve the condition of the physical infrastructure: O&M →≪DM→≪PP. Indonesia's irrigation agency formulated detailed O&M guidelines for systems management as part of the new loan conditions (Ministry of Public Works, 1994a, 1994b). This guideline consisted of a list of O&M activities that should be conducted by the irrigation agency staff in the regional offices. A separate O&M budget was disbursed directly to the provincial irrigation agency as part of project funds.

Despite the formulation of O&M guidelines, maintenance continued to be deferred in practice (Pasandaran, 1991). At the provincial level, the dedicated O&M budget was hardly used for systems O&M, but for other purposes (Suhardiman, 2008). Nevertheless, the infrastructure focus of O&M policy was not questioned in donors' irrigation policy discourse.[6]

Water User Associations

Induced by the emerging importance of community based development studies and approaches (Esman and Uphoff, 1984; Ostrom, 1990), the organisational approach became a new international trend in irrigation development. The inclusion of a community based development perspective in the policy agenda of the international donors was triggered by mounting criticisms from anthropological and sociological studies in rural development (for irrigation, summarised in Eggink and Ubels, 1984). 'Top down' development projects were criticised, and observed to be linked with a deterioration of common property resources and impoverishment of the rural community. Suggesting a 'bottom up' approach as an alternative, the inclusion of farmers in the formulation and implementation of government development policies was advocated (Chambers, 1988).

Unlike previous approaches, the organisational approach (Bottrall, 1981) emphasises the important role played by farmers in shaping irrigation systems' management, their capabilities, and potential role in improving the overall performance of government managed irrigation systems. Farmer participation was encouraged through the formation of water user associations (WUAs) (Lowdermilk, 1986). In Indonesia, the importance of WUA formation was underscored by presidential instruction number 2 of 1984 on WUAs. WUA formation became a new development target in Indonesia's donor funded irrigation projects. The assumed causality for performance improvement was: WUA→≫O&M→≪DM→≪PP.

In practice, WUA formation did not result in improved systems O&M (cf. Schrevel, 1993; Duewel, 1995). This fact, however, did not lead to a reconsideration of the basic premises of the 'deferred maintenance' focused approach. On the contrary, systems maintenance continued to be funded through donor loans as evidenced during the first and second Irrigation Sub-Sector Project (ISSP I and II) from 1987 to 1995.

Irrigation Management Transfer

In the 1990s, the incorporation of the farmer participation concept into the more broadly conceived irrigation management transfer (IMT) policy marked the shift from an organisational to an institutional approach. IMT policy promotes the transfer of management roles and responsibility in irrigation systems management from the irrigation agency to farmer organisations (WUAs). Referring to the successful implementation of management transfer in Mexico (World Bank, 2001), international policy-makers hailed the Mexico model as the reform model for irrigation development (Johnson III et al., 2004; Rap, 2006). Later, the World Bank adopted IMT as one of the cornerstones of its water management policy (Groenfeldt and Svendsen, 2000), and it became a reform model promoted worldwide.

The institutional approach linked farmer participation with financial autonomy (Svendsen, 1993) aiming at greater farmer decision-making authority in overall systems management. The shift in policy discourse from farmer participation to management transfer was impelled by the neoliberal development discourse (Carney and Farrington, 1998). In the irrigation sector, this translated into a strong belief in the force of economic incentives in systems management (Small and Carruthers, 1991; Dinar and Subramanian, 1997). Viewing water as an economic good, neoliberal discourse emphasises the need to shift financial responsibility for government irrigation systems from the irrigation agency to farmers as the direct beneficiaries.

The most basic logic of IMT went as follows: WUA$\rightarrow\gg$CR(cost recovery)$\rightarrow\gg$ O&M$\rightarrow\ll$DM$\rightarrow\ll$PP, but this logic knows several permutations. There was intense debate, in Indonesia as elsewhere, on the question whether irrigation system rehabilitation (ISR) should precede WUA formation plus cost recovery or the reverse (Bruns and Atmanto, 1992). The controversy can be represented as ISR+WUA$\rightarrow\gg$CR$\rightarrow\gg$O&M$\rightarrow\ll$DM$\rightarrow\ll$PP *vs.* [WUA$\rightarrow\gg$ CR$\rightarrow\gg$O$\rightarrow$M]+ISR$\rightarrow\ll$DM$\rightarrow\ll$PP. The debate on the sequencing of cost recovery by WUAs and O&M/ISR has remained inconclusive; 'mutual reinforcement' being a position that encapsulates both while leaving causality in the middle, as stated in the Operations Evaluation Department (OED) report of the World Bank: 'to achieve the full advantage from a system of cost recovery for O&M it is necessary that the revenues recovered [be] directed toward O&M costs' (Jones, 1995: 38).

In Indonesia, IMT policy was initially formulated and implemented in the late 1980s, and was renewed in 1999, both under World Bank funded projects. Prior to 1999, the scope of IMT policy was limited to irrigation systems under the so called IMT pilot projects and the degree of transfer limited to the secondary level[7] of the irrigation systems. In 1999 the scope of management transfer was broadened to all irrigation systems, and its degree extended up to the full system level (Letter of Sector Policy, 1999).[8]

In practice, IMT policy implementation prior and after 1999 resulted neither in improved system performance nor in better cost recovery, partly due to the irrigation agency's resistance towards the idea of management transfer. Findings from studies conducted by the International Water Management Institute and Gadjah Mada University indicate that mixed results with regard to WUAs' role in water distribution in particular, and in irrigation management in general, show that there was no direct link between WUA formation and system performance (Vermillion et al., 2000). The conventional pattern of farmers deferring major maintenance costs until the government might return with external assistance for infrastructure rehabilitation was not overcome by turnover (Murtiningrum, 2002; Bruns, 2003).

In summary, the different phases of post-independence Indonesian irrigation policy focused on different mechanisms for irrigation system performance enhancement, reflecting international policy trends. In all irrigation policy incarnations a canal infrastructure in good technical shape was considered the key to success; differences in the policies were differences in the approach to achieve that good shape. The infrastructure emphasis was maintained discursively as well as practically across the post-independence period.

III. Simplifications in the Dominant Narratives

From the later stage of the technical approach until the formulation of IMT policy in Indonesia, international donors, national/international policy-makers collectively and consensually agreed[9] that the problem of poor systems performance was rooted in rapid deterioration of the irrigation infrastructure – labelled as 'deferred maintenance'. New policy strategies (WUA formation and IMT) were defined in both the organisational and institutional approaches, and the subject of intense debate. For instance, the role of the irrigation agency was recommended to evolve from development agent in the technical approach to become more of a farmer's partner in the institutional approach (Vermillion and Sagardoy, 1999). Similarly, the role of farmers was projected from development recipient to become more of a development agent. These strategies, however, remained ensnared in the infrastructure-oriented problem definition and development paradigm.[10] The issue of 'purpose'[11] continued to be explained from the donors' point of view as the absolute need to maintain a good condition of the physical infrastructure. As stated in the Letter of Sector Policy (1999): 'A deferred maintenance culture together with periodic externally aided rehabilitation has resulted in a costly short-lived irrigation system'.

Simplification 1: Translating Correlations into Causalities

International donors, and others, correctly observe the joint occurrence of poor performance (PP) of Indonesian irrigation systems and deferred maintenance. International donors posit a causal connection between the two in their problem framings: DM → PP. We question this framing by first showing that the assumed causality DM → PP is not how irrigators and system managers perceive the role of and practically use irrigation infrastructure in day to day water management. We then explain how deferred maintenance institutionally functions as a desirable rather than a problem.

During in-depth field work in 2004 we found that farmers do not have any particular interest in the infrastructure's condition, apart from its role as a tool to convey irrigation water to their fields. Farmers hardly ever complained about the poor condition of their irrigation infrastructure if their water needs were met (Suhardiman, 2008). Farmers do not neglect system maintenance for the purpose of deteriorating the irrigation infrastructure, nor do they make complicated trade-off calculations between their own short-term inputs into maintenance and the likelihood of external (longer-term) repairs in response to deterioration. Regular maintenance of the irrigation infrastructure does not significantly increase the actual water flow in the canal, despite the link between maintenance and irrigation systems efficiency posited in irrigation science (Carruthers and Morrison, 1994; Skutsch and Evans, 1999). In practice, farmers solve water scarcity problems either by approaching the irrigation agency staff for additional water, or by arranging additional supply illegally – not through regular maintenance.

Similarly, irrigation agency staff did not consider regular infrastructure maintenance as instrumental for system performance improvement, but rather evaluated the need for such maintenance against the usefulness of a deteriorating system for mobilising rehabilitation funds. This logic became apparent during fieldwork when the irrigation agency staff took important visitors (mostly project officials from provincial or national irrigation department) to the sites of the deteriorated infrastructure to justify the need for rehabilitation. Neither farmers nor system managers' behaviour is thus strongly shaped by the assumed DM → PP causality. Maintenance and rehabilitation of infrastructure apparently play a different role and are part of broader and more complex considerations than getting the irrigation system to function as per design.

In Indonesia, deferred maintenance institutionally functioned more as a desirable than as a problem. Deferred maintenance is perpetuated by central and regional governments' interests in using their allocated sector development budget. Formally, before the fall of Suharto in 1998, the provincial government was responsible for system O&M while the national irrigation department remained in charge of construction and rehabilitation (IOMP, 1987: background point 4). In

practice, the provincial government neglected systems O&M and used the O&M funds primarily to increase government staff salaries. The national irrigation department tolerated the provincial government's negligence as this served its interest to ensure access to infrastructure rehabilitation funds from both the state treasury and international donors. Through this access, it continued to rehabilitate irrigation infrastructure on regular basis almost regardless of the actual condition of the infrastructure. In general, a government agency has the tendency to annually spend all the allocated funds as unused funds will have to be returned to the national treasury, while such returns can result in a decreased budget allocation for the next year (Suhardiman, 2008). Following a self-reinforcing logic (Vermillion et al., 2000), the provincial government's negligence of O&M is rooted in the fact that they can rely on regular if not repetitive premature rehabilitation conducted by the national irrigation department. Deferred maintenance thus serves to keep the budget cycle going, and assists institutional reproduction at different bureaucratic levels.

Rather than being each other's cause, we suggest that deferred maintenance and poor performance are both caused by something else: $X \rightarrow DM + PP$ and are a symptom of more chronic problems in the sector. Translating the DM/PP correlation into a causality effectively obscures the X factor. The political logic of this is discussed below after having identified two more simplifications in irrigation problem framing.

Simplification 2: The FMIS-WUA Analogy

International donors designed the organisational characteristics of WUAs taking local farmer organisation in community governed and managed irrigation systems (so called FMIS) as an example. Assuming that the concept of farmer organisation under FMIS can be replicated in government managed irrigation systems, the idea was to establish government induced farmer organisations whose role was to solve the problem of poor system performance (Coward, 1980). As Hunt (1989: 79) jested: 'The analogy is indeed attractive, if the farmers would only participate, the thinking goes, then the ditches would be constructed, the water would be allocated, and most important of all, the maintenance would be done'. The translation of a farmer participation concept as found in FMIS into government managed irrigation systems is problematic, but it was not questioned in the dominant policy narratives.[12]

Studies on WUAs show that the organisational properties possessed by irrigation communities cannot be transferred to government managed systems simply through the formation of WUAs (Freeman and Lowdermilk, 1985; Bromley and Cernea, 1989). A distinct organisational characteristic of WUAs as compared with farmer organisations in FMIS is that in FMIS farmers control the water source (self-governance), as well as arrange overall water distribution (self-management) (Hunt, 1989). A WUA's authority in government managed irrigation systems is limited to the lower levels in a system's hierarchy (the tertiary and sometimes secondary level). In Indonesia, WUAs' role in water distribution practices was undermined by their lack of authority to ensure farmers' water supply as the irrigation agency field staff remained in charge for the operation of major infrastructure (Schrevel, 1993; Duewel, 1995; Suhardiman, 2008). Moreover, no institutional framework exists within which to negotiate allocation and distribution; the irrigation agency being legally the single responsible actor 'above the outlet'. Our field research shows that WUA staff hardly touched the irrigation outlet devices unless they encountered urgent water scarcity problems, which often forced them to damage/break the infrastructure.

This conundrum was documented in the international literature as early as 1980 (Wade and Chambers, 1980), but was not incorporated into WUA programme thinking. That thinking maintained the (implicit) assumption, a simplification, that poor system performance in government managed irrigation could be addressed with a 'local level only' approach, that is, an approach that targeted its interventions at the tertiary level, and often suggested that farmers needed to be 'educated' to improve their irrigation practices (cf. Mollinga et al., 2007).[13]

The assumption that farmer organisations under FMIS can be replicated in government managed irrigation systems, and that poor system performance can be thus successfully addressed through 'local level' intervention, is a simplification that obscures three key characteristics of government managed irrigation: (i) the crucial role of the irrigation agency in providing reliable water supply, and its common failure to do so, (ii) the challenge of governing multi-users systems, and (iii) the divergent interests, allocation questions and conflicts among irrigators. In short, the simplification negates the everyday politics of irrigation management (Mollinga, 2008).

Simplification 3: Farmers-irrigation Agency Relationship

Under the 1990s 'institutional approach' of IMT, international donor documents express the belief that the problem of persistent poor performance in government managed irrigation system can be solved through the transfer of management responsibility from the irrigation agency to farmer organisations (WUAs). The dominant policy narrative posits that farmers would have a higher sense of ownership toward the irrigation infrastructure[14] if they are given the responsibility to manage the irrigation systems. Consequently, it is thought that this increased sense of ownership could eventually eliminate the problem of deferred maintenance, and thus solve the problem of persistent poor performance.

With IMT international donors and policy-makers project a new role (such as basin manager and regulator) for irrigation agencies (Johnson III et al., 2004). Our interviews with irrigation agency staff at different administrative levels showed that the agency was not always convinced about its new role, and questioned the need for management transfer. International policy-makers apparently assumed either that the irrigation agency would be willing to change its role in the sector development or that it could be ordered and forced to make direct changes in its organisational functioning in accordance with the proposed policy reform, following IMT policy adoption. The lack of agency conviction was often camouflaged by the irrigation agency's formal acceptance of the proposed change, as stated in loan agreements between the agency and the donors.

The key simplification in IMT narratives is that new WUAs can be empowered by the very institution these organisations are thought to replace. That the irrigation agency has identity and interests of its own, and cannot be treated as being merely an administrative implementer of policy (Quarles van Ufford, 1988), is not given sufficient consideration. Perhaps not surprisingly, IMT policy implementation in Indonesia continues to be limited to the secondary level of the irrigation systems due to the irrigation agency's resistance to increase the scope and degree of management transfer (Bruns and Atmanto, 1992).[15]

IV. The Logic of Obscuration: Political Effects of Portraying 'Deferred Maintenance' as Dominant Cause

Sikkink (1991: 2) states that: 'The consolidation of developmental ideas often depends on the degree to which the new model fits with existing ideologies of important economic and social groups'. This section argues that the logic of donors' attachment to the misinformed causality and ungrounded assumptions regarding the centrality of 'deferred maintenance' in explanations of poor performance, and the other simplifications that were discussed above, is not caused by oversight, but is rooted in donors' interest to sustain and reproduce their particular role in irrigation development in Indonesia. In this sense the article is a case study of 'paradigm maintenance' (Broad, 2006) (also see Foucault, 1991; Molle, 2008).

The presentation of 'deferred maintenance' as the causal argument in the dominant narratives achieves three things. First, it downplays the role of poor construction in the vicious cycle of poor construction/deferred maintenance/premature rehabilitation that irrigation interventions seek to break. By downplaying poor construction and emphasising deferred maintenance, donors

distance themselves from the problem of bureaucratic rent seeking that underlies poor construction in the irrigation sector. Moreover, instead of problematising the use of development funds, the emphasis on deferred maintenance provides a logic for providing additional development funds (Ferguson, 1997). By defining deferred maintenance as the key problem in government irrigation systems, the donor–country relationship remained stable; funds for system rehabilitation and maintenance continued to come from donor funded project budgets.[16]

Second, emphasis on deferred maintenance, together with the other two simplifications, keeps international donors on an apparently apolitical development track. The IMT narrative disconnects IMT from the issue of bureaucratic reform. IMT is a 'flight forward' in the sense of defining new roles for both irrigators and irrigation agency, leaving their present roles unquestioned other than that their outcome is 'poor performance'. This goes to the extent that donors present IMT as a managerial/technical measure to improve systems performance, to be implemented by the irrigation agency, thus effectively camouflaging the political aspect of changing power balances that is, or rather, logically should be, part of management transfer. In the approaches preceding IMT policy, the role of the irrigation agency remained even more unquestioned than in IMT narratives.

Third, the dominant narratives reflect a set of ideas that can easily be translated into donor agencies' legally prescribed organisational rules and procedures. With the shift from the technical to the O&M approach, the obligation to include O&M budget as part of the overall project budget does not complicate the overall project management, as this additional procedure can be monitored and evaluated using the same standard of measurements and indicators. Similarly, the formation of WUAs can be incorporated as an additional activity in the overall project management because WUA's role remains focused on system maintenance. Finally, monitoring and evaluation of management transfer activities can be conducted using the same measurement principle as IMT continued to be implemented within the overall context of infrastructure development.

The dominant narratives thus represent a shared causal belief (poor systems performance due to deferred maintenance), notions of validity (visibly deteriorated irrigation infrastructure), and sets of common practices associated with a set of problems (project management procedures) of the international donor community in irrigation development (Yee, 1996). In the 'technical irrigation' era deferred maintenance emerged as a solution based problem definition through which donors could address their developmental concerns and interests, a justification continued in the organisational approach and IMT policy. The way Indonesian IMT implementation procedures are rooted in systems maintenance and rehabilitation of irrigation physical infrastructure (see Vermillion et al., 2000) shows that IMT formulation, notwithstanding its institutional vocabulary, was driven primarily by donors' interest for performance enhancement through improved maintenance, as does the discussion on sequencing of system rehabilitation and turn over referred to above.[17]

V. Discussions and Conclusion

This article has analysed how an infrastructure-oriented development paradigm has remained dominant in a succession of policy narratives that purportedly focus on the 'institutional dimensions' of irrigation reform: WUA and IMT centred approaches. We have particularly shown how international donors' problem framing as part of substantial continued financial support has contributed to this persistence. We have discussed the transformation process from 'difficulty' to 'policy problem' for the Indonesian irrigation sector, a sector where national policies are strongly shaped by international policy trends.

Analysis of the policy transformation process shows the resonance between donors' interest to preserve their hegemonic role in the formulation process of international policy trends and the irrigation agency's interest to preserve its sectoral privileges in the national sphere. In the context of development cooperation, the 'difficulty → problem' transformation process has limited

vulnerability to direct contestation and open confrontation as it takes place in a 'closed' and 'delocalised' forum involving primarily those who have direct interest in consensual transformation. In Indonesia's irrigation sector, sector development decisions were negotiated primarily by international donors and the respective sector ministries with some formal but limited involvement from other government agencies. The national irrigation agency's inclination is to accept donors' agenda rather than risking the halting of donors' funding, as this funding is instrumental to reproduction of the irrigation agency's prominence in the national sphere. Similarly, international donors are inclined to promote widespread adoption of international policy trends by developing countries governments, relying on the national irrigation agency's formal compliance to adopt these policies, in order to achieve disbursement targets (cf. Mosley et al., 1995; Araral, 2005).

This structural 'lock in' of the irrigation policy discourse in the resonating interests of international and national policy elites that we have summarised above does, however, not capture the full dynamics of the situation. The Indonesian case shows that the poor results of irrigation management interventions are at least partly rooted in the misrepresentation of the management problem in government irrigation systems in the dominant narratives of the past decades. These narratives have meant that certain avenues for addressing management problems were closed off, discursively (for instance, analysis of the functioning of the irrigation bureaucracy) as well as practically (for instance, inclusion of irrigators in irrigation governance). The continuing inconvenient truth of poor performance thus generates paradoxes and contradictions in irrigation policy, which have accumulated over time. These are manifest particularly in the IMT approach. By simultaneously portraying the irrigation agency as a government agent incapable of managing the irrigation system, and as reform agent responsible for the formulation and implementation of IMT, the dominant narrative effectively suggests that high performance farmer organisations can be formed and developed by an unreformed and inefficient irrigation agency.

The discursive manoeuvring that is needed to maintain the policy logic underwriting the resonance of the international and national policy elite interests is thus not without cracks and fissures. Performance related evidence can be interpreted variably, causing policy frames conflicts (Rein and Schön, 1993). For instance, the poor condition of the irrigation infrastructure can be mobilised as evidence by IMT proponents to promote IMT (by assuming that farmers are willing to take over systems management and more capable in doing it, or that the irrigation agency is incapable to do its tasks; as often expressed by non-governmental organisations (NGOs) and civil society groups in Indonesia), as well as seen as evidence by IMT opponents for halting IMT (by assuming that farmers are not willing to take over systems management and are responsible for the deterioration of the irrigation infrastructure in the first place; as suggested by the majority of irrigation agency staff at different administrative levels). Similarly, farmers' lack of technical knowledge to manage the technically complicated irrigation systems can be mobilised as evidence for halting IMT by IMT opponents, and at the same time, by IMT proponents, as evidence to continue with IMT as a means for capacity building.

To deal with such contradicting accounts, which cannot be solved by reference to empirical evidence as both sides of the argument refer to the same evidence, one 'game that donors play' (cf. Araral, 2008) is that of 'passing the buck' – to the national policy elites. International donors labelled the lack of desirable impact of IMT policy and programmes as so called 'implementation barriers' (Apthorpe, 1986). Among these barriers were: the irrigation agency's lack of motivation to direct the process of management transfer; the WUAs' inability to fill in their new role in systems management; and the lack of coordination between the implementing agencies (Huppert et al., 2001). Rather than explicating the 'why' of these phenomena and design subsequent policy strategies on the basis of that, these elements are simply 'inversed' and presented as preconditions required to be tackled before IMT policy implementation. Proposed remedial actions included: a clear task redefinition between government and farmers; good condition of irrigation infrastructure; and strong support from the government (Frederiksen, 1992). What this mode of reasoning accomplishes, by design or by default, is that when these preconditions and

requirements are not met, donors implicitly portray the poor outcomes of IMT as caused by factors beyond their control as well as beyond their role in IMT. Disguising IMT policy's conceptual limitations as implementation barriers, donors displace their responsibility to (national state) actors at the implementation end, and rely on these so called 'external factors' as escape hatches.[18]

Structuralist explanations of poor performance of the irrigation sector emphasising the 'rent seeking' character of irrigation bureaucracies (Repetto, 1986), and of the donors–national government nexus (see Araral, 2008) posit straightforward relations of causality and resonance: [system of corruption] → [poor performance] and [growth of loan portfolio] ←→ [ensure bureaucratic survival] respectively. Such explanations are simplifications because they do not sufficiently unpack the arrow: the exact mechanisms and processes through which structure translates into outcome are not specified as the analysis of problem framing in irrigation policy narratives in this article has shown.[19] The policy implications are huge: the simplified reasoning logically suggests a transparency/accountability focus of 'good governance' reform of irrigation agencies, along the lines of the 'implementation barriers' referred to above. It makes performance enhancement dependent on structural transformation – hence sometimes very heavy handed (neoliberal) attempts to use donor financial leverage for 'structural adjustment'. Within the irrigation sector this has produced very limited results in most cases, and in larger countries with powerful irrigation bureaucracies has been simply politically unfeasible, as in Indonesia (for case studies see Mollinga and Bolding, 2004). Acknowledgement and understanding of the mechanisms and processes that connect structural conditions with outcomes, and of the non-linearity of these connections, can identify less dramatic but possibly more realistic and effective reform strategies, while the paradoxes, contradictions and policy frames conflicts may provide the discursive and policy space for advocating them (see Mollinga et al., 2007 for a general argument).

To conclude our article and argument we report on our field research in Kulon Progo district (Java), to illustrate how such alternative strategies do sometimes 'self-emerge' from the realities of field level irrigation management and would lend themselves for support, also by international development agencies. Our field research shows that unlike their national and provincial colleagues, district irrigation agency staff were concretely involved in farmers' day to day water distribution practices. The field level staff cannot focus on their interest to pull in infrastructure development funds without dealing with farmers' water needs. The research (reported in Suhardiman, 2008) shows how the irrigation agency staff ensured water supply to farmer's fields and farmers paid for the rendered service. This relationship and interaction explains the increased production that was achieved (due to irrigated area expansion and increased cropping intensity)[20] and shows that in this case the role of the agency's field level staff was indeed that of a service provider, though not because of policy instruction, but as emergent from concrete local conditions and relationships. The role that the technical infrastructure played was also different than that envisaged in policy documents. To achieve wider distribution of water the natural drainage system was made use of, circumventing complications associated with conveyance through the canal distribution system. The canal infrastructure was reconfigured and remodelled rather than maintained and rehabilitated (for similar examples of this in the Philippines, see Oorthuizen, 2003).

Performance enhancement thus does not have to revolve around, or start from, perfection of the existing technical infrastructure to ensure its optimal operation (Styles and Plusquelleq, 1997), but rather from the shaping of the farmer agency interface (Vincent, 2001) in ways that speak and respond to concrete field level concerns and relationships. Adapting water distribution patterns, processes and technologies to achieve better water supply to farmer's fields is definitely such a concern: there is no contradiction with existing policy at this general level. However, the simplified and depoliticised accounts and analyses of this concern in international and national irrigation policy documents and irrigation engineering textbook doctrines[21] obscure, evade or ignore actual dynamics and thereby miss out on entry points for change. Approaches starting

from such actual dynamics would conceive of 'WUA formation' and other institutional innovation as a contested and negotiated process of organising and empowering at the farmers agency interface, rather than an act of formal legal and administrative constituting facilitated by a variety of forms of 'capacity building'.

Notes

1. These policy elites include politicians, national and international policy-makers, policy advisors, and international donor agencies. On policy elites as epistemic communities, see Haas (1992) and Yee (1996). We do not suggest that donors carry sole responsibility for the priorities of Indonesian irrigation policy. We do highlight donors' prominent role in providing broader international justification for it.
2. Unusually defensive as compared to other natural resources sectors like forestry. In the urban water supply and sanitation sector there has been more institutional and organisational dynamics, particularly through privatisation and public–private partnership approaches.
3. The resonance with Scott's (1998) perspective on large (infrastructural) projects as instruments of establishing state rule is obvious, but not pursued in this article.
4. Prior to the introduction of high yielding varieties, rice was already an irrigated crop. However, from a 'productive discourse' perspective existing levels of hydraulic water control were lower than required for 'green revolution' agriculture (Ishikawa, 1967).
5. 'Poor performance' was expressed as ineffective irrigation water use resulting in low irrigation efficiency (see Bottrall, 1981; O'Mara, 1990).
6. Apart from the World Bank, Indonesia's donors in irrigation development in the 1980s have included the Asian Development Bank and the governments of the Netherlands, Japan, Australia, and the United States. Though diverse in their approach and mode of operation, these donors share common characteristics in the way they based their development agenda on the international policy trend of a shift from construction towards O&M to catch up with 'deferred maintenance'.
7. Though WUAs were formed at tertiary level, farmers had always been responsible for irrigation management at this level prior to IMT. The tertiary level represents the network of irrigation canals directly connected to farmers' fields. In larger scale irrigation it is the local irrigation unit that receives water from the upstream primary and secondary levels, the conveyance system conventionally managed by the irrigation agency. The secondary level represents part of the conveyance system initially managed by the irrigation agency.
8. The principles of management transfer as stated in the Letter of Sector Policy of 1999 were rendered highly ambiguous by the subsequent Water Law of 2004.
9. Consensus existed among the policy elites on the problem definition – a consensus possible through exclusion of irrigators and line staff (cf. McRae, 1993).
10. See Araral (2005) on the vicious cycle problem of public irrigation in the Philippines.
11. See the five core elements of dominant narratives (agent, act, scene, agency, and purpose) in Kaplan (1993).
12. And neither were the sometimes idealised understandings of FMIS questioned in policy discourse (cf. Mosse, 2003).
13. See Mollinga (2003) for how, in the Indian case, under the Command Area Development (CAD) programme, the irrigation agency actively kept WUA formation and activity at the level 'below the outlet', not allowing it to affect 'above the outlet' governance and management, being its own domain. In Indonesia institutional reform initiatives for 'proper' operation of the main system was initiated under Irrigation Sub Sector Project I, but with little sustainable impact.
14. This belief originated at least discursively from the experience with the Gal Oya irrigation project in Sri Lanka, where the combination of physical rehabilitation and farmers' involvement resulted in the successful establishment of a farmer organisation and a significant increase in water productivity (Uphoff, 1986). However, later findings show that the positive lessons from Gal Oya have not been repeated even within the country (Aluwihare and Kikuchi, 1991).
15. The terminology 'irrigation *management* transfer' is itself evasive, if not misleading. What is actually implied in strong formulations of IMT is *governance* transfer, that is, transfer of the power to allocate water and funds. While irrigation agencies may be willing, even happy, to transfer management tasks, they are generally highly reluctant to transfer governance power (see Mollinga and Bolding, 2004).
16. Deferred maintenance is a symptom, we suggest, of institutionalised corruption within the irrigation agency, and corruption a significant part of the X factor in $X \rightarrow DM + PP$. The 'system of political and administrative corruption' (cf. Wade, 1982 for India) that operates in the Indonesian irrigation bureaucracy will be discussed in detail in a separate article (Suhardiman and Mollinga, in preparation; see also Repetto's analysis (1986) on rent-seeking in irrigation). The key element for the present analysis is that the flow of international irrigation funds significantly supports the so called *upeti* system, which constitutes a strong logic for continuation of donor projects quite unrelated to irrigation management as such. As an integral part of *upeti* system donor funds become an important financial means for the national elite to gain and sustain political power (MacIntyre, 1994). We argue that this political value of donor funds necessitates the irrigation agency to shape its development orientation as to fit into donors' investment

strategy and comply with the dominant narratives. See also Anderson (1991) on the continuity between the colonial bureaucracy and the present day bureaucratic mechanisms and procedures.

17. Rationales for reform vary with actors' and agencies' perceptions. Many irrigation officials may have believed that performance improvement was important, but for the Ministry of Finance, the budget savings that IMT promised were clearly an important part of the reform rationale. Similarly, different actors within one agency could position themselves differently as regards to certain policy problems (see Suhardiman, 2008 for detailed discussion).
18. In addition, this stratagem allows the reproduction of a self-perception of donors' developmental role as being paramount, or, in reverse, the reproduction of a relationship with national government officials that is one of dependence with mutual benefits (cf. Mosse, 2004).
19. In both cases the analytical black box is 'incentives'. In addition, there may be additional structural determinants.
20. The way this service provision based relation between farmers and the irrigation agency resulted in increased yields highlights the paradoxical notion of poor systems performance/deferred maintenance arguments in donors' dominant narratives. In Indonesia, 'poorly performing' systems produce average yields of 3–4 ton/hectare with 2–3 rice crops/year, while Indonesia became a rice exporting country in the Suharto period. Whether achieved yields and other system parameters constitute *poor* performance depends on the standards adopted, what is incorporated in these, and how they are expressed. A discussion of the 'politics of standards' that could be imagined in this connection, and which would involve mobilising critical debates on indicators and cost/benefit calculations, is outside the scope of this article. We are of the opinion that there is a performance issue in Indonesian irrigation, otherwise we would not have written the article, but the argument of the article also suggests that actual levels of performance are perhaps not the key factor in poor performance policy discourse.
21. These doctrines include, in Indonesia, the pasten or k-factor system as well as operation guideline for specific irrigation infrastructure such as the Romijn gates.

References

Allan, J.A. (2006) IWRM: The new sanctioned discourse? in: P.P. Mollinga, A. Dixit, K. Athukorala (eds) *Integrated Water Resources Management: Global Theory, Emerging Practice and Local Needs* (New Delhi: SAGE Publications), pp. 38–63.

Aluwihare, P.B. and Kikuchi, M. (1991) *Irrigation Investment Trends in Sri Lanka: New Construction and Beyond* (Colombo: International Irrigation Management Institute).

Anderson, B. (1991) *Imagined Communities: Reflections on the Origins and Spread of Nationalism* (London: Verso).

Anderson, R.S., Brass, P.R., Levy, E. and Morrison, B.M. (1982) *Science, Politics, and the Agricultural Revolution in Asia. AAAS Selected Symposium 70* (Boulder, CO: Westview Press).

Apthorpe, R. (1986) Development policy discourse. *Public Administration and Development*, 6(4), pp. 377–389.

Araral, E. (2005) Bureaucratic incentives, path dependence, and foreign aid: an empirical institutional analysis of irrigation in the Philippines. *Policy Sciences*, 38(2–3), pp. 131–157.

Araral, E. (2008) The strategic games that donors and bureaucrats play: an institutional rational choice analysis. *Journal of Public Administration Research and Theory*, 19(4), pp. 853–871.

Aspinall, E. and Fealy, G. (2003) *Local Power and Politics in Indonesia: Decentralisation and Democratization* (Singapore: ISEAS).

Bauer, P.T. (1972) *Dissent on Development* (Cambridge, MA: Harvard University Press).

Booth, A. (1988). *Agricultural Development in Indonesia* (Sydney: Allen and Unwin).

Bottrall, A.F. (1981) Comparative study of the management and organization of irrigation project. World Bank Staff Working Paper No. 458, The World Bank, Washington, DC.

Broad, R. (2006) Research, knowledge, and the art of 'paradigm maintenance': the World Bank's Development Economics Vice-Presidency (DEC). *Review of International Political Economy*, 13(3), pp. 387–419.

Bromley, D.W. and Cernea, M.M. (1989) The management of common property natural resources: some conceptual and operational fallacies. World Bank Discussion Paper No. 57, The World Bank, Washington, DC.

Bruns, B. (2003) From voice to empowerment: rerouting irrigation reform in Indonesia in: P.P. Mollinga and A. Bolding (eds) *The Politics of Irrigation Reform: Contested Policy Formulation and Implementation in Asia, Africa and Latin America*, Global Environmental Governance series (Aldershot: Ashgate), pp. 145–165.

Bruns, B. and Atmanto, S.D. (1992) How to turn over irrigation systems to farmers? Questions and decisions in Indonesia. Irrigation Management Network Paper No. 10, Overseas Development Institute, London.

Carney, D. and Farrington, J. (1998) *Natural Resource Management and Institutional Change* (London: Routledge).

Carruthers, I. and Morrison, J. (1994) Irrigation maintenance strategies: a review of the issues. Paper commissioned by GTZ for the MAINTAIN project, Wye College, University of London.

Chambers, R. (1988) *Managing Canal Irrigation: Practical Analysis from South Asia* (Cambridge: Cambridge University Press).

Coward, E.W. (1980) *Irrigation and Agricultural Development in Asia: Perspectives from the Social Sciences* (Ithaca, NY: Cornell University Press).

Crewe, E. and Harrison, E. (1998) *Whose Development? An Ethnography of Aid* (London: Zed).

DGWRD (Directorate General of Water Resources Development) (1986) Irrigation design standards, English version.
Dinar, A. and Subramanian, A. (1997) Water pricing experience: an international perspective. World Bank Technical Paper No. 386, The World Bank, Washington, DC.
Duewel, J.W. (1995) Peasant irrigation social organization and agrarian change: a comparative study of Dharma Tirta water users associations in lowland Central Java. PhD thesis, Cornell University, Ithaca.
Dye, T. (1984) *Understanding Public Policy* (Englewood Cliffs, NJ: Prentice-Hall).
Easterly, W. (2003) Can foreign aid buy growth? *The Journal of Economic Perspectives*, 17(3), pp. 23–48.
Edelman, M. (1988) *Constructing the Political Spectacle* (Urbana, IL: University of Illinois Press).
Eggink, J.W. and Ubels, J. (1984) *Irrigation, Peasants and Development* (Wageningen: Wageningen University Press).
Eijsvogel, W.F. (1949) Enige aspecten van de modern irrigatie-techniek in Indonesië, Overdruk voordrachten no. 2, Koninklijk Instituut van Ingenieurs.
Esman, M.J. and Uphoff, N.T. (1984) *Local Organizations: Intermediaries in Rural Development* (Ithaca, NY: Cornell University Press).
Ferguson, J. (1997) *The Anti-politics Machine: Development, Depoliticisation and Bureaucratic Power in Lesotho* (Minneapolis, MN: University of Minnesota Press).
Foucault, M. (1991) Governmentality, in: G. Burchell, C. Gordon and P. Miller (eds) *The Foucault Effect: Studies in Governmentality* (Hemel Hempstead: Harvester Wheatsheaf), pp. 87–104.
Frederiksen, H.D. (1992) Water resources institutions: some principles and practices. World Bank Technical article No. 191, The World Bank, Washington, DC.
Freeman, D.M. and Lowdermilk, M.L. (1985) Middle level organizational linkages in irrigation projects, in: M.M. Cernea (ed.) *Putting People First: Sociological Variables in Rural Development* (Oxford: Oxford University Press), pp. 91–118.
Groenfeldt, D. and Svendsen, M. (2000) Case studies in participatory irrigation management. World Bank Institute Learning Resource Series, The World Bank, Washington, DC.
Gusfield, J. (1981) *The Culture of Public Problems* (Chicago, IL: University of Chicago Press).
Haas, P.M. (1992) Introduction: Epistemic communities and international policy coordination. *International Organization*, 46(1), pp. 1–35.
Hilgartner, S. and Bosk, C.L. (1988) The rise and fall of social problems: a public arenas model. *American Journal of Sociology*, 94(1), pp. 53–78.
Hofstede, K. and Santbrink, J. (1979) Neerlands Indie: Koloniaal waterbeheer. MSc thesis, Wageningen Agricultural University, The Netherlands.
Hunt, R.C. (1989) Appropriate social organization? Water user associations in bureaucratic canal irrigation systems. *Human Organization*, 48(1), pp. 79–90.
Huppert, W., Svendsen, M. and Vermillion, D.L. (2001) *Governing Maintenance Provision in Irrigation* (Eschborn: GTZ).
IOMP (Irrigation Operation and Maintenance Project) (1987) Policy statement. Department of Irrigation, Ministry of Public Works, Jakarta, Indonesia.
Ishikawa, S. (1967) *Economic Development in Asian Perspective* (Kinokuniya Bookstore Co.).
Jackson, K.D. and Pye, L.W. (1980) *Political Power and Communications in Indonesia* (Berkeley, CA: University of California Press).
Johnston III, S.H., Svendsen, M. and Gonzales, F. (2004) Institutional reform options in the irrigation sector. Agriculture and Rural Development Discussion Paper No. 5, The World Bank, Washington, DC.
Jones, W.I. (1995) *The World Bank and Irrigation*. Operations Evaluation Department of the World Bank (Washington, DC: The World Bank).
Kaplan, T.J. (1993) Reading policy narratives: beginnings, middles, and ends, in: F. Fischer and J. Forester (eds) *Argumentative Turn in Policy Analysis and Planning* (Durham, NC: Duke University Press), pp. 167–185.
Lansing, S.J. (1991) *Priests and Programmers: Technologies of Power in the Engineered Landscape of Bali* (Princeton, NJ: Princeton University Press).
Letter of Sector Policy (1999) National Development Planning Agency, Jakarta.
Lowdermilk, M.K. (1986) Improved irrigation management: why involve farmers?, in: K.C. Nobe and R.K. Sampath (eds) *Irrigation Management in Developing Countries: Current Issues and Approaches* (Boulder, CO: Westview Press), pp. 427–456.
MacIntyre, A. (1994) *Business and Government in Industrializing Asia* (Ithaca, NY: Cornell University Press).
McRae, D. Jr. (1993) Guidelines for policy discourse: consensual versus adversarial, in: F. Fischer and J. Forester (eds) *The Argumentative Turn in Policy Analysis and Planning* (Durham, NC: Duke University Press), pp. 291–318.
Ministry of Public Works (1994a) Guidelines for irrigation system operation (Jakarta).
Ministry of Public Works (1994b) Guidelines for irrigation system maintenance (Jakarta).
Molle, F. (2008) Nirvana concepts, storylines and policy models: insights from the water sector. *Water Alternatives*, 1(1), pp.131–156.
Mollinga, P.P. (2003) *On the Waterfront: Water Distribution, Technology and Agrarian Change in a South Indian Canal Irrigation System*, Wageningen University, Water Resources Series (Hyderabad: Orient Longman).
Mollinga, P.P. (2008) Water, politics and development. Framing a political sociology of water resources management. *Water Alternatives*, 1(1), pp.7–23.

Mollinga, P.P. and Bolding, A. (eds) (2004) *The Politics of Irrigation Reform. Contested Policy Formulation and Implementation in Asia, Africa and Latin America*. Global Environmental Governance series (Aldershot: Ashgate).

Mollinga, P.P., Meinzen-Dick, R. and Merrey, D.J. (2007) Politics, plurality and problemsheds: a strategic action approach for agricultural water resources management reform. *Development Policy Review*, 25(6), pp. 699–719.

Mosley, P., Harrigan, J. and Toye, J. (1995) *Aid and Power: The World Bank and Policy-based Lending* (London: Routledge).

Mosse, D. (2003) The making and marketing of participatory development, in: P. Quarles van Ufford and A. Giri (eds) *A Moral Critique of Development: In Search of Global Responsibilities* (London: Routledge), pp. 43–75.

Mosse, D. (2004) Is good policy unimplementable? Reflections on the ethnography of aid policy and practice. *Development and Change*, 35(4), pp. 639–671.

Mosse, D., Farrington, J. and Rew, A. (1998) *Development as Process: Concepts and Methods for Working with Complexity* (London: Routledge).

Murtiningrum (2002) Assessment of performance indicators for irrigation management transfer program in Papah system, Indonesia. MSc thesis, Asian Institute of Technology, Bangkok, Thailand.

NEDECO (1978) First interim report on agronomy, operation and maintenance, Sedeku, PROSIDA.

O'Mara, G.T. (1990) Making Bank irrigation investments more sustainable. Policy Research and External Affairs Working Papers, Agriculture and Rural Development Department, The World Bank, Washington, DC.

Oorthuizen, J. (2003) *Water, Works and Wages: The Everyday Politics of Irrigation Management Reform in the Philippines*, Wageningen University Water Resources Series (New Delhi: Orient Longman).

Ostrom, E. (1990) *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press).

Pasandaran, E. (1991) *Irigasi di Indonesia: Strategi dan pengembangan* [Irrigation in Indonesia: strategy and development] (Jakarta: LP3ES).

Pasandaran, E. and Rosegrant, M. (1995) Irrigation investment in Indonesia: trend and determinants. *Agro Economic Journal*, 14(1), pp. 1–17.

Quarles van Ufford, P. (1988) The hidden crisis in development: development bureaucracies in between intentions and outcomes, in: P. Quarles van Ufford, D. Kruijt and T. Downing (eds) *The Hidden Crisis in Development: Development Bureaucracies* (New York: United Nations Publications), pp. 9–38.

Rap, E. (2006) The success of a policy model: irrigation management transfer in Mexico. *Journal of Development Studies*, 42(8), pp. 1301–1324.

Rein, M. and Schön, D. (1993) Reframing policy discourse, in: F. Fischer and J. Forester (eds) *The Argumentative Turn in Policy Analysis and Planning* (Durham, NC: Duke University Press), pp. 145–166.

Repetto, R. (1986) Skimming the water: rent-seeking and the performance of public irrigation systems, Research Report 4, World Resources Institute, Washington, DC.

Roe, E. (1994) *Narrative Policy Analysis: Theory and Practice* (Durham, NC: Duke University Press).

Schrevel, A. (1993) *Access to Water: A Socio-economic Study into the Practice of Irrigation Development in Indonesia* (The Hague: Institute of Social Studies).

Schulte-Nordholt, H. (2003) Renegotiating boundaries: access, agency and identity in post-Suharto Indonesia. *Bijdragen tot de Taal-Land-en-Volkenkunde*, 159(4), pp. 550–589.

Scott, J., (1998) *Seeing Like a State: How Certain Schemes to Improve the Human Condition have Failed* (New Haven, CT: Yale University Press).

Sikkink, K. (1991) *Ideas and Institutions: Developmentalism in Brazil and Argentina* (Ithaca, NY: Cornell Studies in Political Economy).

Skutsch, J. and Evans, D. (1999) Realizing the value of irrigation system maintenance. IPTRID Issue Paper no. 2, FAO, Rome.

Small, L.E. and Carruthers, I. (1991) *Farmer-financed Irrigation: The Economics of Reform* (Cambridge: Cambridge University Press in association with IIMI).

Stone, D. (1989) Causal stories and the formation of policy agendas. *Political Science Quarterly*, 104(2), pp. 281–300.

Stone, I. (1984) *Canal Irrigation in British India. Perspectives on Technological Change in a Peasant Economy*, Cambridge South Asian Studies no. 29 (Cambridge: Cambridge University Press).

Styles, S. and Plusquelleq, H. (1997) *India WRM Sector Review* (Washington, DC: The World Bank).

Suhardiman, D. (2008) Bureaucratic designs: the paradox of irrigation management transfer in Indonesia. PhD thesis, Wageningen University, The Netherlands.

Suhardiman, D. and Mollinga, P.P. (forthcoming) *Institutionalised Corruption in Indonesian Irrigation: An Analysis of the Upeti System*.

Svendsen, M. (1993) The impact of financial autonomy on irrigation system performance in the Philippines. *World Development*, 21(6), pp. 989–1005.

Turral, H. (1995) Recent trends in irrigation management: changing directions for the public sector. Natural Resource Perspective, ODI series, London.

Uphoff, N. (1986) *Getting the Process Right: Improving Irrigation Water Management with Farmer Organization and Participation* (Ithaca, NY: Cornell University Press).

Vatikiotis, M. (1998) *Indonesian Politics under Suharto: The Rise and Fall of the New Order* (London: Routledge).

Vermillion, D.L. and Sagardoy, J.A. (1999) Transfer of irrigation management services: guidelines. FAO Irrigation and Drainage article no. 58, FAO, Rome.

Vermillion, D.L., Samad, M., Pusposutardjo, S., Arif, S.S. and Rochdyanto, S. (2000) An assessment of the small scale irrigation management turnover program in Indonesia. IWMI Research Report No. 38, Colombo, IWMI.

Vincent, L. F. (2001) Struggles at the social interface: developing sociotechnical research in irrigation and water management, in: P. Hebinck and G. Verschoor (eds) *Resonances and Dissonances in Development: Actors, Networks, and Cultural Repertoires* (Assen: Royal van Gorcum), pp. 65–82.

Wade, R. (1982) The system of administrative and political corruption: canal irrigation in South India. *Journal of Development Studies*, 18(3), pp. 287–328.

Wade, R. and Chambers, R. (1980) Managing the main system: canal irrigation's blind spot. *Economic and Political Weekly*, 15(39), pp. 107–112.

Wildavsky, A. (1979) *The Art and Craft of Policy Analysis* (London: MacMillan Press).

World Bank (1986) World Bank lending conditionality: a review of cost recovery in irrigation projects. Report No. 6283, Operations Evaluation Department of the World Bank, The World Bank, Washington, DC.

World Bank (2001) Mexico. Irrigation and drainage sector project (loan 3419-ME). Implementation completion report No. 22165, The World Bank, Washington, DC.

Yee, A. (1996) The causal effects of ideas on policies. *International Organization*, 50(1), pp. 69–108.