

## Are water user organisations crucial for water management?

### A post-mortem analysis of water user groups in Thailand and the prospect for institutionalisation<sup>1</sup>

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**Abstract:** *There is wide agreement that it is beneficial to have water users involved in the management of the irrigated systems they depend upon. In the early 1980s, large scale initiatives to establish water user associations were taken in Thailand. Despite the theoretical gains of setting up such associations, the programme was a resounding failure, as most groups were found to be inactive and eventually existed only on paper. This paper briefly examines the genesis of these programmes, and reviews the reasons for their failure, ranging from technical to socio-cultural factors. The paper ponders on the contrast between the lack of interest shown by farmers and the theoretical appeal of such intervention to academic and donors circles. It questions the renewed interest of donors for institutional changes, materialised by the reform of the water sector instigated by the Asian Development Bank, and discusses whether the conditions for their implementation are met.*

## 1 Introduction

During the past forty years, Thailand has developed a total of approximately 3 million ha of medium and large scale irrigation schemes. Their management was entrusted to the Royal Irrigation Department (RID) which was responsible for construction, allocation of water, operation and maintenance. As in many other parts of the world, these public schemes were run in a top-down manner, with no involvement of users in general and farmers in particular.

Based on the overarching principle that irrigation systems perform better when users develop a sense of ownership and take part in decision making, several projects aimed at achieving a degree of participatory irrigation management (PIM) have been implemented in the past. Despite the failure of these attempts, the idea recently came back to the fore as a component of a plan initiated by the Asian Development Bank

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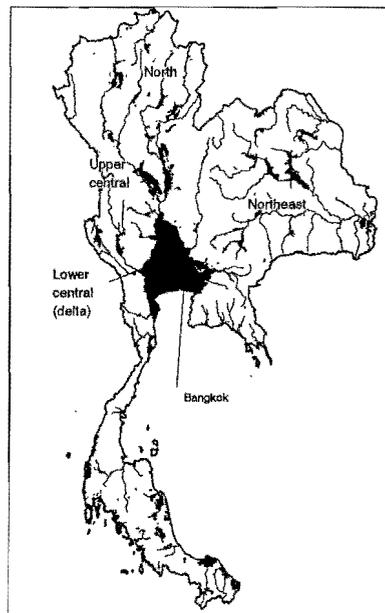
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(ADB) to reform the water sector<sup>5</sup>. Couched in the idiom of community empowerment, participatory management, accountability, and capacity building, to which are added 'new' principles such as cost sharing, economic efficiency, and privatisation (ADB, 2000; Halcrow and Partners *et al.*, 2001), the reform aims at breaking the prevailing nexus between the RID as patron and farmers as passive recipients, replacing it with a clear contractual relation between a service provider and a client. The ideology of accountability and participation (but not that of commoditisation and privatisation) finds some common ground with that of self-reliance, cooperation and participation co-opted by governmental (in line with the 1997 constitution) and academic circles (Vandergeest, 1991), as well as with the rhetoric of the NGOs on grass roots democracy and community-centred development (Rigg, 1991). It is, thus, little contested, but the underlying conceptions of the different actors are often at variance.

The actual situation of Thailand in terms of water management is not homogenous. While most basins experience water deficits in the dry season (notably the Chao Phraya river basin which makes up one third of the country), other basins, like the Mae Klong river basin, still enjoy the status of a surplus basin. Irrigated areas are generally small in the mountainous northern region and medium or large scale in the northeast, while the central region encompasses the bulk of large scale irrigation (medium and large scale irrigated areas amount to two thirds of the total irrigated area) (see Map 1). The problems, as well as the solutions, vary according to the region, the scale, and the water status of the basin. We will focus here on medium and large scale public schemes (although references will also be made in passing to community based irrigation).

Map 1. Main irrigated medium and large scale areas in Thailand



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<sup>5</sup> The proposed reforms are segmented into several sub-areas, including an administrative redefinition of the roles of concerned agencies, the establishment of a water law, the implementation of service agreements between RID and users to be grouped in

This paper endeavours to sketch out the mismatch between theoretical and discursive frameworks on one hand, the implementation in the real world and the perceptions of farmers on the other hand. The discussion builds on five years of field work in the central region, including case studies on existing water user organisations (WUOs)<sup>6</sup> and on water management at different nested levels. The analysis of past experiences is then used to screen current policy proposals and to discuss the scope and prospect for a 'reincarnation' of WUOs in Thailand.

## 2 Past experiences with PIM

A first attempt to design WUOs was recorded in 1963 in the northeast and led to the foundation of the first legal water user association (WUA) in 1966 (Poolswat, 1992). Other WUAs were then created with the following main objectives (JICA, 1994):

- To promote farmers' understanding of the value of water
- To introduce users' participation in the water allocation and maintenance of canal systems and structures;
- To mediate conflicts among farmers regarding water use;
- To help members in buying input and equipment and in selling farm products.

WUAs had to elect a head, or "Common Irrigator", whose attributions were modelled on the head irrigators of Northern Thailand's traditional communal irrigation schemes. In practice, the control of the administration remained pervasive. Project engineers often intervened in the selection because they believed that "the farmers do not always select competent men" (NEDECO, 1970); they were to be paid by farmers but were eventually supported by RID.

Ten years later, in 1974, WUAs proved to be too large in size and in area to allow proper communication with RID, which also felt the lack of regulations and laws to control free-riding and opportunistic behaviour. Emphasis was therefore shifted to water user groups (WUGs) established at the tertiary level. In 1989, RID moved to pool WUGs at the lateral level (integrated water user groups) and further to the main canal level in WUAs (water user associations) which were deemed to function as co-operatives but were not formally registered as such. They resembled the former WUAs with regard to their size and attributions but were not granted formal or legal status.

WUAs, however, were not abolished and remained a legal option of WUOs covered by the Civil and Commercial Code, with the specificity to be able to run commercial activities, although not on a profit-making basis. As a way to associate activities of production, input purchasing and marketing, a legal framework for water user co-operatives was also established under the 1960 Co-operative Act, allowing them to carry out a range of income generating activities for the group. The co-operatives were in general

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associations, and the introduction of some water charge, termed "cost sharing".

<sup>6</sup> WUO is taken here as a generic term for the different types of organisations presented hereafter.

found in RID areas provided with land consolidation, where they were instrumental in collecting fees for (partial) cost-recovery.

Several projects have been implemented in the last two decades to support farmers' participation in the Northeast. NESSI (Northeast Small-scale Irrigation Project) rehabilitated 7 projects in the 1980s. Standard format for WUO rules and regulations were proposed and farmers were expected to take part in water management. However, involvement in operations remained "largely limited to the farm ditch, with no substantial role in allocating or scheduling of water in the main ditch and canal" (Havorongkura, 1995). While Johnson *et al.* (1989), reviewing the impact of the project, stated that WUAs, "inactive since their formation fifteen years earlier, during site construction... have been reactivated and appear to be overseeing site activities", they eventually stopped functioning soon after the completion of the project (Havorongkura, 1995). It was also concluded that improving water management was not enough and that long-term goals of improving crop production and increasing farmers' incomes were needed (Johnson *et al.*, 1989).

Another project was launched in the 1980s, based on the idea that irrigation community organisers (ICOs) recruited among university graduates should bridge the alleged gap between RID and farmers, but this did not prove successful in creating a pattern of organisation which could be disseminated (Halcrow, 2000). A larger project (NEWMASIP) was launched in the 1990s and also attempted to create incentives for farmers to participate in irrigation management and to develop collective actions regarding production and marketing. The degree of success for each of the ten projects considered was extremely varied and only one is known to still have WUAs with some degree of activity. Kawsard (1999) concludes that "in its relatively short life NEWMASIP has not had enough time to progress beyond Stage II (joint management, with different degrees depending on the tasks), but [that] Stage III (turnover) should remain the goal for both farmers and Royal Thai Government".

These different experiences were, by and large, ineffective in triggering a mode of participation which could serve as a model for the region. In almost all cases, activities ceased when project staff discontinued their support or incentives. The level of commitment of RID's staff about the necessity to have users participating in decision-making did not prove sufficient and top-down management remained the rule.

More generally, the nation-wide voluntarist policy and efforts, particularly supported by the World Bank since the late 1970s, aimed at bringing farmers into the operation and maintenance (O&M) of large-scale irrigation schemes in the country proved unsuccessful: active WUGs are at present – but for rare exceptions – virtually non-existent in the countryside.

### **3 Analysing the failure of water user groups**

This section reviews the performance of WUOs regarding their different roles as well as a series of arguments which can be raised to explain the failure of earlier top-down initiatives to create Water User Groups, Associations and Co-operatives. These reasons are both varied and numerous. We focus here on the situation of the middle and lower Chao Phraya basin, which encompass the bulk of large scale public irrigation schemes.

### 3.1 Social structure, individualism and acceptance of inequity

The contrast between Thailand and East Asia led some Western anthropologists, in the post WWII period, to characterise Thai society as "loosely structured" (Embree, 1950). The impression of a lack of a strong social unit was reinforced by the 'Cornell village project' (a comprehensive anthropological study of a village - Bang Chan – located near Bangkok), as expressed by Hanks (cited in Kemp, 1992): "we searched many a month for its centre, for its integrating structure – without success. Bang Chan had a name, but not even the glimmering of a community. Individualism seemed to reign supreme". This was the departure point of a lasting controversy between social scientists in quest of 'structural regularities' and conceptual frameworks to describe the Thai social organisation. Despite the lack of a strong consensus on this issue (see Evers, 1969; Kitahara, 1996 and Molle *et al.*, 2001 for further details), there is nevertheless wide agreement that personalised and flexible networks of dyadic relationships (including patron-client relationships) form the backbone of the social structure, stressing at the same time the absence of corporate groups.

This general view must however be qualified according to the region. The northeast of Thailand displays a higher degree of social cohesion, with 'natural' villages often corresponding to a social unit whereby people can be recruited for collective actions (Misuno, 1976; Shigetomi, forthcoming). Northern Thailand is also often credited with stronger communal cohesion, partly due to the villagers' common reliance on traditional *muang fai* irrigation systems. In contrast, the social fabric of the rural Chao Phraya Delta is widely considered to differ from that of the other regions of Thailand because of its characteristics as a "frontier society," its evolution driven by the development of the rice market economy, and its specific ecological setting. (Kemp, 1992; Shigetomi, 1998). In all cases, whether social disintegration is posited as an outcome (Douglass, 1984) or as a constitutive element of the delta society, it is common knowledge to classify the region as a somewhat peculiar part of Thailand, with farmers prone to individualistic behaviours and market-oriented strategies. While acknowledging the lack of strong built-in social incentives for collective action, it is our contention that farmers in the delta are not totally deprived of the social capital needed to act collectively (see Shigetomi, 1998, for examples on funerals or saving groups, and Molle *et al.*, 2001 for examples of collective pumping). The failure of WUGs in all regions also suggests that the main reasons must be sought elsewhere, although this does not dismiss the evidence that social characteristics are relevant contributing factors.

Staying in the realm of Thai culture, there is one cultural feature that might be more relevant to our present debate: Thai farmers often display a very pervasive acceptance of inequalities (this can be noted regarding the head/tail-end problem, where locational advantages are taken for granted), paralleled, in a more positive tone, by widespread sentiments of tolerance: farmers in the Don Chedi Project (on the western fringe of the delta), for example, are widely sympathetic to those fellow farmers located outside of the irrigated area and who are developing large scale diversion of the same canal water serving, insufficiently, their area. What is an obvious new competition is, surprisingly, not perceived as such. It is not hard to find examples in the literature in which similar situations escalated in severe conflict.

Whether these two traits must be traced to Buddhist culture may lie beyond the scope of this study, but it is tempting to note that the deep feeling that one's situation is not socially determined<sup>7</sup> but, rather, governed by the accumulation in former lives of merits and demerits, obviously has an impact on the way farmers look at what outsiders see as inequities<sup>8</sup>. It follows from these cultural traits that group formation and collective action are not necessarily the preferred options to solve a situation of conflict or inequity. Such situations can be dealt with in different ways:

- The first and most common reaction is conflict avoidance, to adapt to the situation and to search for other opportunities (the "*tham jay*" option). The principal option within agriculture is digging a well or pumping from other sources. Acknowledging the unfavourable position of the plot may also be a push factor towards engaging in non-agriculture activities and keeping agriculture as a secondary activity, or even giving up farming.
- The second is to co-operate and to try engaging in some collective action (the "*chuaykan*" option). This is generally only possible at the local level; farmers will group to pump at the head of the canal or would agree to some rotation within the lateral (under the supervision of RID field staff). This also includes collective maintenance.
- The third one is *intermediation*; most commonly village headmen and sub-district heads, more rarely other local leaders, are called in to solve a dispute; a compromise is found in order to avoid social disruptions. To lose a bit is seen as a much more desirable outcome than public outrage and the damaging of local social relationships. Intermediation allows the avoidance of face-to-face confrontation and lowers the probability of losing face.
- The fourth one is the *patronage option*. Farmers try to obtain a change in their favour by approaching people with adequate power and who are expected to behave as patrons. These patron-client relationships are common in Thai society and easy to observe in political life (Christensen and Siamwalla, 1993; Arghiros, 1999).
- The last one is (unresolved) open conflict, but it is very seldom the chosen option. It was observed in some cases of latent conflicts between villages, sometimes driven by ethnic differences.

It can be seen that cooperation is only one of the options and that, depending on the local context, it may or not be the one chosen by villagers to attempt to remedy their problem.

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<sup>7</sup> Visser (1980), who studied a village of the delta, also reported that villagers think that poor farmers have only themselves to blame for their situation; "indeed the origins of poverty are considered to lie in individual characteristics and situational circumstances of a non sociological nature".

<sup>8</sup> As nicely put by Redmond (1998), Thai see no inherent justice in life: "Is life fair ? No, but why should it be ? (...) life is not something to be legislated, but to be indulged in. Life and justice are like two estranged sisters, one promiscuous and the other proud, who refuse to speak when they meet on the street".

### 3.2 Leadership

The lack of local leadership is also often mentioned as a contributing factor to the failure of the WUOs. The presence of a local leader (someone who can be both a visionary and have the authority to draw his fellow villagers behind him), is strongly correlated with success stories in the countryside (Shigetomi, 1998). Duncan (1978) found that contrasting examples of management at the tertiary level showed the importance of leadership, a view shared by Tubpun (1981) with regard to tank associations in the northeast. The agricultural transformations observed by Molle and Keawkulaya (1996) in the upper delta was also attributed to the initiative of a local and respected head of district. Case studies on water management at the secondary and tertiary levels in different parts of the delta have shown a similar importance of local leaders (Molle *et al.* 2001). This strongly suggests that the human factor is paramount but that there is probably little that can be done to obviate the resulting very contrasting pattern of social responsiveness to opportunities in general and state-initiated projects in particular.

At the same time, it is apparent that such leadership is highly localised, in general at the level of one or two villages, and limited in that wider arrangements at the main or secondary canal level need to be mediated by RID officers, or by politicians at upper levels. It is also apparent that the role of village and district heads as representative of villagers is being undermined by the fact that a growing proportion of such leaders is not involved in farming and manipulate elections (patronage, vote-buying) in order to appropriate the parcels of power transferred to these levels as a result of the decentralisation process (Arghiros, 1999; Nelson, 1998; Ryo, 1999).

### 3.3 Spatial definition of groups

Another difficulty in the setting up of WUGs comes from the definition of hydraulic units. Hydraulic units generally do not correspond to social units, nor do they fit the administrative layout of villages. Despite a wide debate on the relevance of the village as a social unit (see Kemp, 1993; Hirsch, 1993), it is believed that in many cases (especially when villages are not of the linear type), it constitutes a reasonable, albeit not ideal, unit of collective action, decision and control. This is not only so because of the obvious lack of an alternative but because the thrust of accumulated state intervention has, along the years, given some kind of existence to the village. The importance of the village and district heads both in the resolution of local conflicts and as an interface with the state has gradually instilled in villagers some degree of identification with the administrative village they live in.

Exceptions to this may be some villages, often ribbon-type settlements, which have been defined in a totally arbitrary manner. Such cases are more frequent in the lower part of the delta, where settlements follow the canals. In any case, it is readily apparent that if a significant part of a village relies on a given water source, the village headman is likely to be concerned with it, although leadership in such issues often rests with local informal leaders too. However, when the scale of the problem is larger than two or three villages (and typically encompasses several sub-districts), then the articulation between users appears increasingly problematic.

While the issue of social cohesiveness and social relationships do matter for the establishment of the water groups, the lack of fit between hydraulic and social units (whatever definition is retained) is clearly a disadvantage but not an insurmountable factor.

### 3.4 *Social cohesion within wider agrarian change*

An important factor contributing to the success of WUGs comes with situations in which farmers have a “singular dependence on irrigated agriculture for their livelihoods” (FAO, 1999). This means that in a system with few job opportunities outside irrigated agriculture and/or with precarious subsistence-oriented farming systems (whatever the reasons for this), the livelihood of farmers and their families strongly rests on irrigation, as a means to stabilise or increase the household’s production. This degree of dependency is a measure of the resources (money, labour, time) that farmers are likely to be willing to invest in a process geared towards providing them with greater control on water management. Although many other factors may intervene, it is also an indication of whether farmers are likely to be encouraged/forced to raise their social capital and act collectively.<sup>9</sup> Chompoonut’s study (1992) on a WUC of the Kok Katiem Project indicates that the level of participation was correlated with the age, level of education, land endowment, number of persons in household, but not with water conditions. This suggests that farmers with much land or large families may be more interested by water issues, while those with poor water conditions have turned their attention to other activities (see below).

Such a diversification in livelihoods is a global trend (Ellis, 1999), particularly in Southeast Asia (Rigg, 1997), and also applies to Thailand. In the case of the Chao Phraya Delta, a three village survey (Molle *et al.* 2002) and other studies (see Kasetsart University and IRD, 1996; Molle and Srijantr, 1999) have shown the extent of pluriactivity and the composite nature of income within households. While some farmers are fully dedicated to their farm, others are part-time farmers and only grow rice in spare time (typically they would prepare the land and establish the crop on a weekend and monitor water conditions early in the morning or in the evening). Such part-time farmers have little time to devote to collective action and, especially if they are in a favourable location within the hydraulic network, they may be little interested in costly personal investments (in terms of commitment) aimed at raising the productivity of an activity which is only marginal for them.

This trend is also documented in the people’s irrigation schemes found in the north of the country (Charoenmuang, 1994; Cohen and Pearson, 1998). The opening to the world in general and to the wider economy in particular have weakened the individual commitment in collective management of some villagers, therefore weakening the whole institution. Farmers’ cohesion has been weakened by the intrusion of market forces and state intervention in resource management and the failure of the government to ensure proper management led to a renewed interest in decentralised decision-making, without certainty however on whether previous *community failure* situations can be reversed (McCay and Jentoft, 1998).

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<sup>9</sup> Similarly, Boyd and Slaymaker (2000) have found that the adoption of soil and water conservation practices in six countries of Africa, and their support by community leaders, are higher where agriculture is important in livelihoods and where these practices could increase the yield of high value crops.

Farmers' heterogeneity in interest, commitment and social interactivity is a reflection of their economic strategies within a wider multifaceted economy. The degree of dependence of farmers on their agricultural activities is governed by a set of interrelated factors which can come under the term of *agrarian pressure*. If pressure builds up through processes such as growing human densities, fragmented farms, depressed commodity prices and constraints to intensification (such as access to water for dry-season cropping), then farmers will be pushed to improve their situation and may more easily adopt collective solutions. If opportunities are given to escape and release pressure (migration to the land frontier of urban centres, diversification, off-farm job opportunities, etc), then it is likely that a growing number of individuals in the village will have a declining interest in agriculture, other sources of income, and less incentive to engage in collective action. The cultural propensity for conflict avoidance can more easily express itself when drastic disadvantages regarding access to water can be dealt with by occupational shifts.

However, the absence of critical socio-cultural stratification (as seen for example in India) and a certain reluctance to negate someone's right when a situation of crisis arises are positive factors allowing collective responses. The engine for such responses may not be purely community-based but also relayed by the different tiers of the administration, especially when meso- and macro-levels are concerned. The arrangements of 1998 and 1999 are examples of such reactions which were implemented by both farmers and the administration, with the mediation of local politicians.

### 3.5 *Role in system maintenance*

Maintenance is an essential component of irrigation systems management, as it eventually governs their long term sustainability. An often stated benefit of IMT is that it is conducive to improved maintenance, as users take over this responsibility. Whereas RID is responsible for the maintenance of the primary and secondary levels, farmers are expected to take over the tertiary level. WUGs were ascribed this role, under the supervision of the "ditch leader" (*huana tho*, or head of pipe). Ditch maintenance is essential to preserve access to water for those whose plot is not located along the canals. Cleaning and grass-cutting are tasks to be undertaken annually, while dredging is done according to necessity.

In most areas, farmers are now widely contributing to this task by gathering money, often under the initiative of one of the farmers. The drudgery associated to ditch dredging has been overcome by resorting to mechanical means. "Macro" excavators are widespread nowadays and can be easily rented for a reasonable price. Second, it has also been observed (Molle *et al.*, 1998) that the burden of maintenance, as well as on-farm development, has partly been transferred to local budgets. With the decentralisation and the possibility for farmers to have a say in the allocation of some funds, more and more operations of ditch digging or dredging are passed on to the sub-district or to district budgets.

It follows that what might have been one of the strongest incentives for farmers to co-operate has been waning over the years, thus contributing to undermining the existence and effectiveness of WUGs. Chompoonut (1992) found that the cooperative maintenance of the ditches was the main reason for the farmers of a WAC in Lop Buri to associate but the last ten years have significantly altered this point. This has to be reckoned before designing new patterns of joint management, in order to avoid putting emphasis

on an issue which is often critical but does not appear to be central here, since farmers have already found an (easier) way to deal with maintenance needs.

### *3.6 Role in collecting fees*

Fee collection was one of the major tasks attributed to WUAs in the late sixties by the government, both as a way to finance O&M expenditures and as a response to pressure from the World Bank (Duncan, 1978). Farmers were expected to pay 10 baht on registration and annual "assessments of 10% of the increase in crop production". Such a collection rapidly turned out to be a failure. No provisions was set to deal with defaulters and the will of the government also waned as it became clear that farmers were not reaping the expected benefits from the new irrigation infrastructures and that the WUAs were showing little sign of activities. The further shift of priority to WUGs at the tertiary level did not prove more successful in this respect (Duncan, 1978).

This experience does not necessarily invalidate the interest to levy water charges nor the capacity of farmers' organisations to carry out this task (Small and Carruthers, 1990). However, it strongly demonstrates that when the power of WUOs to formulate and to be involved in decision-making is negligible, there is little chance to mobilise farmers for levying a fee. Freeman and Lowdermilk (1985) have aptly emphasised that "farmers are quick to see that, from an individually rational standpoint, one is foolish to pay water assessments...when water service is not substantially affected by making payment. To disconnect farmer payments of assessment for maintenance, whether in cash or kind, from water delivery is virtually to invite organisational decay."

### *3.7 Role in production and marketing*

As mentioned earlier, one of the conclusions of the first experiences with the promotion of farmers' participation in irrigation schemes was that water management in itself was not sufficient to provide the "glue" expected to bind farmers together and have them act collectively.

It was posited that a wider range of activities likely to benefit farmers would help raising their level of participation. Judging from the very low number of WUCs in Thailand (only 6 officially registered), there is no indication that this assumption was valid. Generally speaking, the level of activity of co-operatives in the central region is quite varied but they rarely appear as a stronghold of farmers' activity. This does not dismiss the fact that farmers can significantly improve their lot by a greater control on marketing and on the price system (and that it may even be a priority) but raises questions on *how* this can be achieved and on whether conventional existing co-operatives are up to the task. In some cases, it was apparent that a lack of training (e.g. accounting), communication or organisation (e.g. fertilisers coming too late) contributed to the poor performance of WUAs or WUCs. It remains that with the easy availability of input and relatively efficient marketing channels, the services offered by cooperatives do not constitute a decisive appeal.

### 3.8 *Role in managing water: The ditch (tertiary) level*

We now turn to one of the core functions of the WUGs, the management of water at the tertiary level. WUGs are widely expected to define rotations within the ditch, to help solve conflicts which may arise, and to follow the discipline dictated by the scheduling defined at the lateral level (open FTOs and farm inlets only in turn, control tampering with structures, etc).

The most pervasive evidence derived from interviews of farmers is that they most often don't know who is, or is supposed to be the "head" of their ditch. This is indicative of the erosion of the very sense of the existence of WUGs in farmers' minds and can be traced to the prevailing conditions of water distribution in the delta and most other places. During the rainy season, by and large, canals function at their full-supply level and the ditches receive enough water to make any discipline useless. If this is not the case, pumps are readily set to fill up the ditch. In the dry season, the overwhelming use of pumps also serves as a substitute for more constraining rules and management. It is easy to understand that in such conditions there is little scope for WUGs' activity.<sup>10</sup>

Also paramount are the changes which have affected rice cultivation. In the 1960s and 1970s most of the irrigated rice was transplanted and on-farm control was generally poor. These two factors demanded a higher degree of collective action. Transplanting had to be planned because of the necessity to prepare nurseries in advance and to have the fields in muddy conditions at the right time; staggering of calendars and of water distribution was to be planned with more certainty. Widespread plot-to-plot distribution of water also meant that neighbouring farmers were compelled to attune their operations and calendars. All these changes in cropping techniques (wet broadcasting), on-farm conditions (ditches) and pumping capacity have dramatically decreased the necessity of interaction between the farmers of the same ditch. These points are not sufficiently considered, which explains why current proposals inadequately insist in building WUOs starting with WUGs at the tertiary level (Halcrow, 2000).

In order to manage water at the ditch level, through the design of some kind of rules aimed at sharing water, farmers must first have a notion of what they are supposed to share. Irrespective of whether this comes as a right or as a planned seasonal entitlement, defined by a combination of discharge, time and frequency, farmers must first build a concrete image of the flow which is going to enter their ditch. In conventional gravity systems, this flow of water will be contingent upon proper regulation of the water level in the secondary canal. This level, in its turn, will be governed by the inflow of water at the head of the canal. In other words, it is obvious that nested levels are dependent upon the upper ones.

### 3.9 *Role in managing water: The lateral (secondary) level*

We have note earlier that the initial official setting of WUOs had been done at the lateral level and that there was, later, a shift to the tertiary level, believed to be easier to deal with. There was a sense that lower levels had been neglected and that integrated water user groups, at the lateral level and WUC (co-

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<sup>10</sup> But the use of pumps at the head of ditches requires arrangements among farmers to make sure that water reaches the field of whoever is pumping. In practice, this has not met with serious problems.

operatives) should rather be conceived as the logical outcome of the expected maturation and aggregation of the WUGs. At that time, much of the expected benefit of irrigation schemes could not be realised because of poor access to water. Individual pumping capacity was still limited and cropping operations (notably transplanting and plot-to-plot irrigation) demanded a certain degree of planning, timing and ditch management, as seen above.

Such a policy was not giving due consideration to the logic of water distribution. Because the critical issue of establishing a scheduling of water allocation at the lateral level was not understood, groups at the lateral levels were undermined by a process parallel to that of the WUGs described above. Without any defined pattern of water supply at the lateral (and main) canal levels, there was no sense of *what* should be managed and how. Rather, farmers' strategies shifted toward adapting to the context of uncertainty, which gave way to a spectacular boom in individual pumping capacity and in the tapping of secondary water sources, notably shallow aquifers.

Because of: 1) the unpredictable and fluctuating supplies, 2) the existence of a technical solution providing a flexible alternative to social organisation, and 3) the cost of the pumps being “lower” than the transaction costs which would occur if collective organisation was attempted, farmers swiftly adopted these innovations. It goes without saying that if a remarkable efficiency has been achieved by the spread of numerous pumping devices allowing the tapping of whatever water ponding or flowing resource is accessible, the shift has also been detrimental to equity, as head enders tend to access water first.<sup>11</sup>

Farmers in a WUA (or an integrated water user group) must know what they are associating for. If the purpose of the group is to distribute water to all members, and to collaborate with the other groups supplied by the same main canal, their activity must be part of a wider allocation plan in which they know when they will get water. If it is not the case and if water is not sufficient or too uncertain to ensure that all members are served, it is easy to understand that the group will quickly disband. If there is too much water, then there will be no necessity to act collectively as everyone will be served; if supply is too uncertain and scarce, no discipline is possible because some group members will not get their share. In a rather narrow intermediate situation, there may be scope for cooperation, if establishing some kind of rotational schedule is to bring more efficiency and more equity without raising transaction costs too much. No arrangement can cope with a haphazard succession of such situations and pumping appears as the logical individual strategy.

This shows that the main cause of failure of the WUOs was the incapacity of RID to establish both clear allocation and operational strategies for water management in which users might have had a say and that would define a service-like commitment ensuring an agreed-upon schedule. The reasons for such a failure include structural aspects (insufficient means of regulation of the hydraulic network, poor on-farm infrastructures, etc), managerial aspects (lack of control upon cropping calendars and, more recently, uncoordinated and uncontrolled water use in river basins), and climatic aspects, but also the once prevailing – and still ingrained – conception of farmers-agency relationships.

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<sup>11</sup> Although it also allowed tail-enders located along drains to access water, sometimes in better conditions than head-enders.

### 3.10 *Relationships between farmers and RID*

Relationships between state agencies and farmers have long been characterised by a degree of paternalism answered to by a mix of passivity and suspicion. The ideas that farmers are not educated, stubbornly grow rice with wasteful techniques, and do not co-operate for water management are commonplace. Such a vision also permeates the way officers envisage reforms, group setting or co-management and can be found more generally in the Thai administration as a whole (see examples in Nelson, 1998). For Atiya Chakulwisut (2000); "although they are known as civil servants, many bureaucrats think of themselves as the people's masters. They think of rural villagers as backward and passive, unable to initiate anything for themselves. This attitude bars many of them from getting to know the people and whatever needs they might have". This is echoed by Samudavanija (1985) who sees state officials "inclined to blame the people for lack of enthusiasm, ignorance and disinterestedness", and by Rubin who emphasises that "many of the practical and material problems of rural development are attributable to the Thai perspective concerning superior-inferior relations" (1974; cited in Rigg, 1991).<sup>12</sup>

PIM programmes have generally been well-intentioned voluntarist interventions aimed at fulfilling a "blank" identified by bureaucrats in Bangkok. Groups were established in a top-down and prescriptive manner with the assumption that farmers would adhere to the activities or to the structures proposed after due training and being shown "their interest". As expressed by Poolsawat (1992), "bringing a WUO to its goal is a matter of patience and effort. It is a continuous task of repeated monitoring and problem resolution"; emphasis is often laid on "strengthening water user organisations" (JICA, 1994) and on "efforts by RID and other agencies to help [WUOs] develop" (Havorongkura, 1995). The process is therefore envisioned as a task of convincing somewhat apathetic and reluctant stakeholders that their interest lies in the structures proposed to them. These attempts are undermined by the inappropriateness of the conceptions underlying state involvement in the countryside.

It is interesting to note that most proposals regarding PIM and most reports reflecting on past experience and future prospects generally continue to borrow from these conceptions, as appears in the vocabulary used. In most cases, it is even difficult to see how the new proposal differs from the old ones (and therefore why the outcome ought to be more successful). Most studies recommend to establish new organisations or "revive" old ones, insisting on "community preparation" or "strengthening WUGs", and assume that, "this time", with good will, dialogue, proper training and involvement, they are bound to be successful (JICA, 1997). In the NEWMASIP Project, agencies' officers "were encouraged to communicate with farmers through the WUO, thus recognising the importance of farmers institutions, and

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<sup>12</sup> See also Nelson (1998), who shows that the Local Administration Department expects that "people should show gratitude to officials or appreciate bureaucratic service, believe in and worship administrators and rely on them (reliance is a special kind of non-professional and personal relationship, i.e. of a patron-client type)". In the same line, Demaine (1986) observes that "there is still a tendency to view development in traditional terms as government providing services to the population in return for their allegiance. Furthermore, patron-client ties are, of course, of a purely personal nature, and obligations are determined informally, with the client being unable to sue the patron, for which reason 'gratitude' for his service is appropriate."

improving efficiency” (Kawsard, 1999). Rhetorical emphasis is always placed upon the necessity to involve farmers in the process<sup>13</sup> but these hopes are eventually frustrated.

Despite “more training”, “better on-farm infrastructures and canals”, “improved cooperation between agencies”, and “continuing efforts by RID and other agencies to help them develop, most WUAs [Water Users Associations] stopped functioning soon after their creation” (Havorongkura, 1995). While stressing both the importance of community involvement and their poor responsiveness, officers are caught up in the contradiction inherent in the neo-populist discourse of 'empowerment' which comes with both an interventionist thrust (behind 'conscientisation' or 'educating villagers'), and a priority allegedly given to local knowledge and participation (Long and Villarreal, 1996). As the redesign of the social map and of the power balance, implicit in a decentralisation process, is largely devised by the administration, there is little wonder that no real change is brought about and that attempts to institute PIM are still perceived locally as state-initiated and state-oriented<sup>14</sup>, without real benefit for the farmers in terms of improved access to water.

The successive efforts to establish and strengthen WUOs have not only been little successful and wasteful in terms of budget and energy, but they have also contributed to the spread of mistrust and of lack of interest regarding state initiated groups, jeopardising future reformist initiatives.

### 3.11 *Impetus for the reforms*

According to Geiger (1995), in most cases governments are the primary initiators of irrigation management transfer, the most common reasons being the “lack of government funds to pay for O&M, inability of governments to collect service fees, and poor management by underfunded irrigation agencies. Additional reasons are a shortage of qualified people and the broader privatisation policies of governments”. In the present case, however, these reasons do not appear as the main driving force. Government funds are scarce but even in the post-1997 economic crisis situation agencies have never been short of budget to the point that they were obliged to resort to drastic reforms. There is no sign that RID is adequately described as 'underfunded' and that its budget is to be drastically reduced, despite the determination from the Ministry of Finance to reform the administration; there is therefore no strong incentive for reform, as was the case in the Philippines or Mexico (Groenfeld and Sun, 1997). O&M costs are pictured by consultants as a 'huge drain' on the government budget but in reality only represent 0.16% of the national income. Fee collection is non-existent, and its improvement therefore not an issue.

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<sup>13</sup> See for example Poolsawat (1992): “farmers should be involved to an appropriate extent in every phase of project development”; JICA (1994): “Farmers should be treated as key participants, not just as a supplementary element of the system”; Havorongkura (1995): “Farmers participation is key to project success. The Water User Group is a fundamental institution to facilitate farmers participation”; etc.

<sup>14</sup> This can suggestively be seen in the use of the term “*phi liang*” (*phi* is elder, *liang* is to feed or by extension to raise) applied to RID with regards to its setting of WUOs. Interestingly we have, albeit occasionally, seen this word used both by RID officers and by farmers.

Up to the present time, pilot projects and reforms have admittedly been funded and driven by the availability of external funding and implemented by centralised technical agencies, a situation not particular to Thailand (Bruns, 1993).

#### 4 Prospects for the 'reincarnation' of WUOs

Despite the somewhat discouraging picture conveyed by the above analysis, this section examines the difficulties lying ahead but also investigates the scope for a successful PIM process.

##### 4.1 *Difficulties at the farmers', RID and national levels*

Despite the appeal of the ethos of empowerment and grassroots level governance to both neo-liberal quarters and NGO activists (Hansen and Calavan 1994; Crook and Manor, 1995), the decentralisation process is not deprived of ambiguity (Carney, 1995; Nelson, forthcoming). In small catchments, particularly in the north, there is a wide assumption that communities (as epitomised by the traditional *muang fay* systems<sup>15</sup>) can take over their destiny and manage water resources within the catchment. However, as mentioned earlier, it is also recognised that these "communities" have undergone a profound process of opening to the outside world and that, in many cases, they cannot be seen any more as autonomous isolated rural entities. Livelihood strategies have long incorporated pluri-activity and migrations and the collective interest for water issues is therefore heterogeneous. New interests have also surfaced, in particular those of urban-based investors that have developed golf courses, hotels and other recreational facilities, and who are also competing for water resources. In addition, local leadership is now increasingly challenged by entrepreneurs and local economic elites that manage to get elected in sub-district or district level elections (Arghiros, 1999). In such a context it is not sure that extolling the virtues of the "community" and gleefully assuming that the old modes of organisations are suitable to face the new challenges posed may be an optimistic point of view. More generally, several recent studies have cautioned about overlooking that local institutions are (dynamic) embodiments of local practice shaped by social and power relations (Mollinga and van Straaten, 1996).

These problems also occur by and large to farmers in large state-run schemes (although they are primarily concerned with the allocation process within irrigated areas). Hunt's remark (1989) that the interest in WUOs and their bureaucratic design are based on an abusive extrapolation of the more successful experience of community-based irrigation systems is all the more relevant in the Thai context.

Another prerequisite of any reform is that RID be in a position to fulfil its part of the 'service agreement' binding it to users, as a crucial condition for successful transfer is that *sufficient* and timely deliveries of water be made available to farmer-managed units within the scheme (FAO, 1995). This not only requires significant upgrading of the hydraulic regulation capacity and data management but also that control over water use (and users) in the basin be restored. At the moment, it appears that despite the great majority of

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<sup>15</sup> See for example Tan-Kim-Yong (1995): "People's Irrigation System (PIS) can be viewed as an integrated system consisting of an intricate intertwining of local village technology with human commitment of cooperation, and a supportive philosophy which lends this system its coherence and cohesiveness."

water diversion in the lower Ping and lower Nan Rivers being done either by RID or by DEDP projects, these public agencies are in practice unable to control water use in these areas. This example is indicative of the practical difficulties which will be faced when trying to establish a system of control or registration of water uses.

The cultural aspects mentioned earlier should also not be downplayed, as it is apparent that many officers have a vision of villagers, and a conception of their role and position towards them, which poorly fit the new role that they are supposed to fulfil. Asserting that "building capacity within RID to reorient itself toward strengthening and providing long term support to water users is the key to PIM success" (Halcrow, 2001), focuses only on 'capacity' and tells little on how such a radical cultural change in mentalities can be achieved. It assumes optimistically that deeply entrenched vertical relationships may be transformed into horizontal partnerships by some process of capacity building. As Freeman and Lowdermilk (1985) have put it, "central officials are typically quite eager to decentralise the unglamorous and costly tasks of routine ditch maintenance, but fear to empower local command area organisations with real authority over water allocation, conflict management, and rehabilitation work". Past experiences have shown time and again that without proper (and drastic) 'incentives' reforms were quickly diluted in the inertia of resilient public agencies.

In upper tiers of the administration, as well as in political circles, the support for the reform may often be half-hearted or nonexistent. There is no evidence at the moment of a wide political determination to engage in sweeping large scale reforms. There are a few reasons which can explain the current political immobility. As stressed by Ostrom (1992), "politicians lose one source of power when irrigation is no longer a part of the "pork barrel" politics of a nation; hence politicians are unlikely to initiate major changes in fee structures unless pushed hard by tight budgetary constraints". Whatever the reasons, international experience shows that political backing is a crucial factor leading to the success of PIM (Groenfeld and Sun, 1997). Currently, the thrust of the reform is clearly provided by external agencies and, regardless of whether the envisaged measures are sound or not, the still weak commitment of officials and administrations does not bode well for the future.<sup>16</sup>

In addition to the fact that sound legal provisions for the reform of the water sector are not going to be issued in the near future<sup>17</sup>, such provisions are obviously useless without a basic capacity of law enforcement and penalties, an aspect in which Thailand admittedly has an unimpressive record (Flaherty et al., 1999; Christensen and Boon-Long, 1994; Wongbandit, 1995; Kraisoraphong, 1995<sup>18</sup>). This difficulty is best exemplified in the incapacity to regulate groundwater abstraction in the BMA, despite the horrendous costs in flood damage and flood protection caused by land subsidence, and the fact that

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<sup>16</sup> In addition, as post-crisis financial aid to the country is made conditional upon the adoption of the policy package, some sectors of the Thai society feel that they are being 'blackmailed'.

<sup>17</sup> Drafts of the Water Bill were elaborated ten years ago and have remained stranded in administrative processes.

<sup>18</sup> "Thai society has not been known to be a legally conformative one...[and] is built on personal relationships, not on principle or laws."

measures have been debated already for 25 years. Another recent example is the ban on inland shrimp cultivation (which remained a dead letter).

Last, the current unconvincing operationalisation of pilot river basin organisations are revealing of a host of legal, cultural and institutional difficulties that lie ahead. These initiatives have so far generated several formal meetings with 'stakeholders'<sup>19</sup>, but the weight of the administration still appears overwhelming<sup>20</sup>, and the lack of legal and political backing leave these organisations with no real power.

#### 4.2 *Scope for a reform*

Stemming from industrial management in developed countries, "the underlying assumption of participatory management is that with it comes worker satisfaction and increase in productivity" (Raby, 1991). This borrowing from the corporate world is also reckoned with by Groenfeld and Sun (1997) who see PIM not as a novel concept, but rather as a "way of bringing irrigation management into line with proven management theory." Evidence on hand suggests that the alleged potential gains of turnover in productivity are in fact scant (Samad, 2001). In the Chao Phraya basin, the current system of water management has been shown to be rather efficient (Molle *et al.*, 2000; Molle, 2001)], both in terms of water use (only 15% of the water released by the dams in the dry season is lost to non-beneficial uses) and in terms of sectorial allocation (economic activities with a higher return are given priority). Despite being characterised by irregular deliveries and deregulated scheduling, water use is allowed to be efficient thanks to reuse, conjunctive use and pumping facilities (two situations often believed to be exclusive).

WUOs also appear desirable for their possible role in collecting fees and contributing to cost recovery. I have discussed the rationale for cost recovery elsewhere (Molle, 2002), but the viewpoint adopted here is that charging water is not an end in itself but only a 'glue' factor, or tool, in the hypothetical case in which service agreements could be enforced in parallel with a degree of financial autonomy of RID's field operation offices. A half-way reform that relies on the good will of the administration is generally not successful because there is no built-in mechanism to overcome natural resistance from the bureaucracy. Pilot projects endure as long as foot-dragging can be mitigated by an influx of money and the presence of consultants, but fail as soon as assistance is on the wane. A mutual dependency between the agency and the users must be established and this is generally achieved when the agency is given a degree of financial autonomy, part or all of the salary of those in charge of the distribution of water being provided by the users themselves. A water fee thus appears as the binding element of a 'virtuous circle' that relates performance and user satisfaction with staff salaries (Small and Carruthers, 1990; Svendsen, 1993).

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<sup>19</sup> Discussions with NGOs and farmers' representatives show that there is a growing sense of weariness stemming from the gradual perception that the process is largely cosmetic, with stakeholder consultations mainly aimed at giving to it a gloss of legitimacy and implicit endorsement of the civil society.

<sup>20</sup> The examination of the 8 existing pilot water basin organisations shows that farmers are grossly under-represented. The WBOs of the upper and lower Ping rivers, for example, have only two farmers representatives, against 22 and 20 officials respectively... (These numbers speak for themselves, even if some rebalancing was recently on the way).

In addition, the main argument for PIM is, I believe, that the growing uncoordinated (re)appropriation of water by users (including new users) in a context of declining supply is conducive to tensions and inequity that are bound to increase. A PIM process must allow users to participate in the allocation process, that is in the decision on how seasonal entitlements are defined, both at the basin level and within a given irrigation project. This is crucial because the variability of the available supply (in the dry season) makes any predetermined arrangement precarious. This entails that it is more important to have user representatives at the secondary and main canal levels, as well as within the river basin organisations to come, dealing with how water is shared, rather than focusing on lower levels and on water distribution. If farmers are given rights and not only duties they will be likely to adopt any provision contributing to the enforcement and defence of these rights. To ensure, again, that allotments agreed upon are transformed into effective scheduling and supply, much remains to be done to control water, technically and institutionally, especially in the larger river basins. It cannot be overemphasised that this is not a facilitating factor to defining service agreements but a prerequisite.

Reforming the nexus between farmers and agency requires wide support of the government and of politicians in general, especially with regard to the financial autonomisation of RID. Raising awareness may need substantial effort and take a few years (just as in the Philippines, where institutional development officers and farmer organizers acted for 15 years). Legal provisions must also be established to back up the process. Thus, pushing for reform when such awareness is still very limited is likely to be counterproductive. The case of underground water use in Bangkok Metropolitan Area is a good indicator that such is the case at present. Different measures (technical control of volumetric use, equating underground and tap water prices, etc) have been proposed for almost three decades to control the overdraft of the aquifer which results in land subsidence, horrendous costs for flood protection, and increasing risk of a major catastrophe (30% of the capital is now under sea level). However, pricing regulation has, again, recently been opposed successfully by the Thai Federation of Industry (The Nation). Because the costs to the nation are far greater (and to some extent, because control is technically easier), political will might be first tested in the enforcement of the control of underground water use.

## **5 Conclusions**

The failure of past attempts to set up WUOs in Thailand can be traced back to a host of adverse factors. While some lie within the local culture (no traditional pattern of corporate group, patron-client relationships between state officials and villagers, etc.), or in the growing heterogeneity of individual interest and strategies due to economic diversification, the most salient reasons are probably the incapacity to effectively empower rural users and the failure to deliver water with adequate regularity and certainty. In addition, the needs for maintenance, fee collection, or the advantage of managing collectively production input or output did not prove to be significantly attractive and provided little 'glue'. Rather, pumping and conjunctive water use were developed in an individual manner and cropping calendars ended up deregulated.

The past failure of the WUGs appears as a telling example of the difficulty to instil changes which are heavily contingent upon radical and concomitant transformations in infrastructures, management, social organisation, and in deep-seated conceptions of state/farmer relationships. The main lesson that can be

drawn is that a fragmentary reform is not necessarily better than no reform at all: the interlocking of the different aspects of IMT reforms implies that missing elements are likely to jeopardise the whole edifice (Small and Carruthers, 1990). In particular, the crucial step of financial autonomy of the management agency, with user fees paying for part or all of its operational costs, is rarely achieved because of its critical implications on the administration. This is the case in Thailand, where, in addition, the conditions required to establish service agreements are far from being fulfilled in large-scale irrigation schemes. Control over water is weak not only for technical reasons, but also for institutional and political ones, as there is no legal or administrative mechanisms to ensure full control of effective water use.

A second conclusion that can be drawn from the analysis of past experiences is that it is doubtful that any well-intentioned pressure from external donors or international institutions may compensate for the lack of critical internal financial squeeze or strong political will. The policy implication is that blueprints based on either ideological stances or on a pressing desire to establish reforms hurriedly labelled as 'best practice' are a sure recipe to failure if these reforms are not reworked out based on the particularities of each situation. Despite being a common caveat of the conclusions of papers on water policies, this call for caution is intriguingly little heard in practice (Molle, 2000). Cooper and Packard (1997) have aptly underlined the contradiction between global development efforts, that demand a degree of simplification, standardisation, replicability and 'stable decision-making frameworks', and the need to encapsulate interventions in an in-depth understanding of local realities. While this dilemma probably knows no easy solution, simply stating that "RID *should* adopt a new role of partnership with the water users as their client" (Halcrow, 2000), [emphasis added] might well be wishful thinking in Thailand, where the government is admittedly highly centralised. One should in particular pay heed to the evidence raised by social scientists that "Thailand has a long history of mostly ineffective attempts to decentralise power" (Bruns, 1993), and that "a truly decentralised, grass-roots development approach comes into conflict with bureaucratic methods and Thai society" (Rigg, 1991).

More generally, Thomas and Grindle (1990) have made the case for an interactive and flexible model of policy reform initiative, where foregoing an initiative becomes an option, as against a prescriptive linear model of implementation where emphasis is on defining a target and assessing the degree of compliance with that target, and where inevitable limitations are eventually blamed on a lack of political will or institutional capacity.<sup>21</sup> The failure to address the political nature of participatory policies and to incorporate knowledge of goals and behaviours of agencies and politicians are the most common feature of poor policies (Pinstrup-Andersen, 1993; Mollinga *et al.*, 1999). This calls for a gradual and flexible approach where a possible 'reincarnation' of WUGs is *enabled*, as opposed to attempting a voluntary 'resurrection' of groups, by the successful articulation of rehabilitation, agency reform, and by defining decision-making processes of water allocation and distribution in which users have a decisive and effective role.

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<sup>21</sup> Thomas and Grindle (1990) "Reforms have been attempted when the administrative or political resources to implement them did not exist. The result has generally been misallocated resources, wasted political capital, and frustration."

## References

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- Arghiros, Daniel (1999) *Political Reform and Civil Society at the Local Level: the Potential and Limits of Thailand's Local Government Reform*. Paper presented to the 7th International Conference on Thai Studies, Amsterdam.
- Boyd, Charlotte and Tom Slaymaker (2000) *Re-examining the 'more people less erosion' hypothesis: special case or wider trend?* ODI Natural Resources Perspective, Working paper Number 63, 12 p.
- Bruns, Bryan (1993) Promoting participation in irrigation: reflections on experience in Southeast Asia. *World Development* 21(11):1837-49.
- Carney, Diana (1995) *Management and supply in agricultural and natural resources: is decentralisation the answer?* ODI Natural Resources Perspective, Working paper Number 4, 12 p.
- Chakulwisut, Atiya (2000) *Towards royal visions*. <http://www.bangkokpost.net/king2000/toward.html>
- Charoenmuang, Tanet (1994) The governance of water allocation problems in Thailand, four case studies from the upper Northern Region. In *Water conflicts*, edited by TDRI, pp 53-86.
- Christensen, S. R. and Ammar Siamwalla (1993) *Beyond patronage: Tasks for the Thai state*. 1993 TDRI Year-end Conference on "Who gets what and how?: challenges for the future, TDRI, 58 p.
- Christensen, Scott R.; and Arreya Boon-Long. (1994). *Institutional problems in Thai water management*. Thailand Development Research Institute, Bangkok, 54 p.
- Cohen, John M. and Norman T. Uphoff (1980) Participation's place in rural development: seeking clarity through specificity. *World Development*, Vol. 8, pp. 213-235.
- Cohen, Paul T. and Ross E. Pearson (1998) Communal irrigation, state, and capital in the Chiang Mai Valley (Northern Thailand): twentieth-century transformations. *Journal of Southeast Asian Studies* Vol. 29 No 1, pp. 86-111.
- Cooper, Frederik and Randall Packard (1997) *International development and the social sciences, essays on the history and politics of knowledge*. University of California Press, 361 p.
- Crook, Richard C., and James Manor (1998) *Democracy and decentralisation in South Asia and West Africa: participation, accountability and performance*. Cambridge: Cambridge University Press.
- Demaine, Harvey (1986) "Kanpathana : Thai views of development". In *Context, meaning and power in Southeast Asia*, edited by M. Hobert and R.H. Taylor, Ithaca, New York, Southeast Asia Program, Cornell University, pp. 93-114.
- Douglass, M. (1984) *Regional integration on the capitalist periphery : the central plains of Thailand*. Institute of Social Studies, The Hague.
- Duncan, Henry Scott (1978) Local irrigator's groups: assessment of their operations and maintenance functions. In *Irrigation policy and management in Southeast Asia*, IRRI, pp. 185-191.
- Ellis, Frank (1998) Household strategies and rural livelihood diversification. *The Journal of development Studies*, Vol.35, No.1, pp. 1-38.
- Embree, J.F. (1950) Thailand : a loosely structured social system. *American Anthropologist* 52 : 181-193.
- Evers, H.D. (ed.) (1969) *Loosely structured social systems, Thailand in comparative perspective*. Cultural Report Series N°17, Yale University, Southeast Asian Studies.
- Freeman, D.M. and Max K. Lowdermilk (1991) Middle-level farmer organisations as links between farms and central irrigation systems. In *Putting people first: sociological variables in rural development*, edited by Michael M. Cernea, A World Bank Publication, second edition, pp. 113-143.
- Geijer, J.C.M.A (ed.) (1995) *Irrigation management transfer in Asia*. Bangkok and Chiang Mai, September 1995, FAO, IIMI, RAP Publication 1995 :31, pp. 248.

- Groenfeld, D. and P. Sun (1997) Demand management of irrigation systems through users' participation. In *Water: Economics, Management and Demand*, edited by Melvyn Kay, Tom Franks and Laurence Smith, E & FN Spon, pp. 304-311.
- Halcrow and Partners, ARCADIS/Euroconsult (2000) *A strategy for participatory irrigation management in Thailand*. Draft final report Vol. 8, Capacity Building in the water resources Sector project ADB-TA 3260-THA, 58 p.
- Halcrow and Partners, ARCADIS/Euroconsult (2001) *Component C: reorienting and reorganising service delivery operations in irrigation*. Final report Volume 3/3, Capacity Building in the water resources Sector project ADB-TA 3260-THA.
- Hansen, Gary and Michael Calavan (1994) *The development of civil society in Thailand: donor approaches and issues*. U.S. Agency for International Development. Center for Development Information and Evaluation. USAID working papers, No. 210. Washington D.C.: United States. Agency for International Development.
- Havorongkura, Metha (1995) Irrigation management transfer in Thailand: Huay-Aeng Irrigation Project case study. In *Irrigation Management Transfer in Asia*, edited by Geiger, FAO/IWMI, pp. 127-134.
- Hirsch, Philip (ed.) (1993) *The village in perspective: community and locality in rural Thailand*. Chiang Mai University, 96 p.
- Hunt, Robert C. (1989) Appropriate social organization? water user associations in bureaucratic canal irrigation systems. *Human Organization* 48(1): 79-90.
- JICA (1994) *Upper Central Region Study, Vol. 4: Water resource management, agricultural development and land use management*.
- Johnson, S. H. III; Patamankul, S.; Apinantara, A.; Charoenwatana, T.; Issariyanukula, A.; Paranakian, K.; Reiss, P. (1989) *Medium scale irrigation systems in Northeast Thailand: Future directions*. Arlington, VI, USA: ISPAN. xxiv, 198 p.
- Kasetsart University; and IRD (ex-ORSTOM) (1996) *Identification of agricultural and irrigation patterns in the Central Plain of Thailand: Prospects for agricultural research and development*. DORAS Project, Bangkok, 220 p.
- Kawsard, Kanching (1999) Water user organisation promotion under the NEWMASIP, Thailand. In *Irrigators' organisations*, edited by Charles Abernathy and Franz Heim, DES, pp. 70-80.
- Kemp, Jeremy (1992) *Hua Kok: Social organisation in North-central Thailand*. CSAC Monographs 5, South-East Asia Series, 212 p.
- Kemp, Jeremy (1993) On the interpretation of Thai villages. In *The village in perspective: community and locality in Rural Thailand*, edited by Philip Hirsch.
- Kitahara, Atsuchi (1996) *The Thai rural community reconsidered*. Faculty of Economics, Chulalongkorn University, 190 p.
- Kraisoraphong, Keokam. (1995) *Evolving water policy in the Bangkok Metropolitan Region*, Ph.D. thesis, University of British Columbia, Canada, 335 p.
- Long, Norman and Magdalena Villarreal (1996) Exploring Development Interfaces: from the transfer of knowledge to the transformation of meaning. In *Beyond the impasse: new directions in development theory*, edited by Frans J. Schuurman, pp. 140-168.
- McCay, B.J. and S. Jentoft (1998) Market or community failure? Critical perspectives on common property research. *Human Organisation*, Vol. 57 No. 1.
- Mizuno, K. (1976) Thai pattern of Social Organisation: notes on a comparative study. In *Southeast Asia: nature, society and development*, edited by Ichimura, S., Southeast Asian Studies, Kyoto University, Hawaii Press.
- Molle François; C. Chompadist; Thippawal Srijantr; and Jesda Keawkulaya. (2001a) *Dry-season water allocation and management in the Chao Phraya delta*. Research Report no 8. DORAS Project. Bangkok: Kasetsart University, 250 p.

- Molle, François and J. Keawkulaya (1996) Water management and agricultural change : a case study in the upper Chao Phraya Delta. *Southeast Asian Studies, Kyoto University*, Vol. 36, No. 1. pp.32-58.
- Molle, François and Thippawan Srijantr (1999) *Agrarian change and the land system in the Chao Phraya Delta*. DORAS Project, Kasetsart University, Bangkok, Research Report n°6, 191 p.
- Molle, François (2001) *Water pricing in Thailand: Theory and practice*. Research Report no 7. DORAS Project. Bangkok: Kasetsart University. 78 p. [http://std.cpc.ku.ac.th/delta/conf/Acrobat/Papers\\_Eng/pricing.pdf](http://std.cpc.ku.ac.th/delta/conf/Acrobat/Papers_Eng/pricing.pdf)
- Molle, François (Forthcoming) Allocating and accessing water resources: practise and ideology in the Chao Phraya delta. In *Thailand's rice bowl: Perspectives on social and agricultural change in the Chao Phraya delta*, edited by F. Molle and Thippawal Srijantr, Bangkok: White Lotus.
- Molle, François; Chompadist C. and P. Sopaphun (1998) Beyond the Farm-Turn-Out : on-farm development dynamics in the Kamphaengsaen Irrigation Project, Thailand. *Irrigation and Drainage Systems*, Volume 12, no 4, pp. 341-358.
- Molle, Francois; Thippawal Srijantr and Lionel Latham (2002) *Balance and imbalances in village economy: access to irrigation water and farming systems in the Chao Phraya Delta*. Paper presented to the 8th Thai Studies Conference, Nakhon Phanom, 9-12 January 2002, 29 p.
- Mollinga, P. P.; Doraiswamy, R. and Kim Engbersen (1999) *Participatory irrigation management in Andhra Pradesh, India: policy implementation and transformation in the Tungabhadra Right bank Low Level Canal*. 8<sup>th</sup> Conference of the IASCP, Bloomington.
- Mollinga, P. P. and C.J.M. van Straaten (1996) The politics of water distribution. In *Water Policy: allocation and management in practice*, edited by P. Howsam and R. C. Carter, Silsoe College, Cranfield University, UK, pp. 243-250.
- Nedeco/ILACO (1970) *Northern Chao Phya study*. Bangkok.
- Nelson, Michael (1998) *Central authority and local democratisation in Thailand*. Studies in Contemporary Thailand No 6. Bangkok: White Lotus, 325 p.
- Nelson, Michael (Forthcoming) Chachoengsao: democratising local government? In *Thailand's rice bowl: Perspectives on social and agricultural change in the Chao Phraya delta*, edited by F. Molle and Thippawal Srijantr, Bangkok: White Lotus.
- Pinstrup-Andersen, P. (ed.) (1993) *The political economy of food and nutrition policies*. Washington, DC, USA: IFPRI. Xx. 278 p.
- Poolswat, Daundaun (1992) *A guideline for WUO's development*; On-farm water management branch, Royal Irrigation Department, 15 p.
- Raby, Namika (1991) Participatory management in large irrigation systems: issues for consideration. *World Development* 19: 12, pp. 1767-1776.
- Redmond, Mont (1998) *Wondering into Thai culture*. Bangkok, 271 p.
- Rigg, Jonathan (1991) Grass-roots development in rural Thailand: a lost cause? *World Development* 19(2/3): 199-211.
- Rigg, Jonathan (1997) *Southeast Asia: the human landscape of modernization and development*. London: Routledge
- Rubin, Herbert J. (1974) *The dynamics of development in rural Thailand*. Southeast Asian Studies, Northern Illinois University, special report No 8.
- Ryo, Takagi (1999) Interaction and power relations: a village head (kamnan) election in central Thailand. *Tai Culture* 4 (1):153-168
- Samad, Madar (2001) *Impact of irrigation management transfer on the performance of irrigation systems: a review of selected Asian experiences*. ACIAR Water Policy Workshop, Bangkok, 15 p.

- Samudavanija, Chaianan (1985) *Village bureaucracy and development* (Bangkok: The Public Affairs Group and Friedrich Ebert Stiftung), p. 11.
- Shigetomi, Shin'ichi (1998) *Cooperation and community in rural Thailand*. Institute of Developing Economies, 148 p.
- Shigetomi, Shin'ichi. (Forthcoming) Social structure and local organisations in the Chao Phraya Delta. In *Thailand's rice bowl: Perspectives on social and agricultural change in the Chao Phraya delta*, edited by F. Molle and Thippawal Srijantr, Bangkok: White Lotus.
- Small, L. and Ian Carruthers (1991) *Farmer-financed irrigation: the economics of reform*. Cambridge: Cambridge University Press, 233 p.
- Svensden, Mark (1993) The impact of financial autonomy on irrigation system performance in the Philippines. *World Development*, Vol. 21, No. 6, pp. 989-1005.
- Thomas, John W. and Merilee S. Grindle (1990) After the decision: implementing policy reforms in developing countries. *World Development*, Vol. 18, No. 1, pp. 1163-1181.
- Tubpun, Yuavares (1981) *Economics of tank irrigation projects in North-east Thailand*. Ph.D. University of Minnesota, 269p.
- Uphoff, Norman (1991) Fitting projects to people. In *Putting people first: sociological variables in rural development*, edited by Michael Cernea, pp. 467-511.
- Uraivan Tan-Kim-Yong (1995) *Muang-Fai communities are for people: institutional strength and potential*, Chulalongkorn University, Social Research Institute, 109 p.
- Visser, Robert (1980) *Aspects of social and economic change in a village in the Central Plain of Thailand*. Paper presented at the Thai-European seminar on social change in contemporary Thailand, University of Amsterdam.
- Wongbandit, Amnat (1995) Water law in Thailand: constraint or facilitation for sustainable development? In *Proceedings of the Third Chulabhorn Science Congress, water and development: Water is life*. Bangkok.