Chapter 10

Allocating and accessing water resources: practice and ideology in the Chao Phraya River Basin

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10.1 Introduction

Irrigation is a process which allows farmers to partly overcome climatic constraints. It enables the stabilisation of agricultural production by supplementing rainfall during occasional dry spells, as well as the expansion of cropping into the dry season when no cultivation would otherwise be possible. Securing the water supply also encourages farmers to engage in capital-intensive and risky production (such as fruit trees, orchids, aquaculture) by removing a factor of uncertainty. This translates into a growing pressure upon water resources, the chief production factor allowing intensification.

Command over scarce resources is an expression of power and a promise of wealth. Providing water is traditionally the prerogative of the king, who mediates its supply from supernatural forces. *Chonlaprathan*, the Thai word for irrigation, embodies the notion of a royal gift[1]. Allocating water is a decision-making process situated at a convergence point of political, administrative, and users' spheres. The actual pattern of access to water may not correspond to the ideal or planned pattern of allocation. Those in need of water devise individual and collective strategies to bend or subvert the allocative process to their benefit. Water allocation and actual water usage are thus two interdependent faces of the same coin, moulded by the distribution of roles and power, and shaped by the physical constraints of hydraulic networks.

Over the past two decades, farmers in the Chao Phraya Delta have intensified their cropping patterns in order to counter falling agricultural prices, compensate

for reduced plot sizes, and fulfill rising consumption needs. To secure the water required for this intensified cropping they have pursued various methods to subvert or augment the government's system of water allocation. A farmer's access to water is increasingly governed by his locational advantages, investment capacity, and political clout. As a result, the overall distribution is becoming more inequitable. At the same time, the availability of irrigation water has begun to fall because of rising diversion to Bangkok consumption and other priority uses, and this fall will become steeper in the future. Under present conditions, increasing scarcity is likely to lead to increasing competition and further declines in equity. Schemes to counter these trends range from populist proposals for greater local participation to neo-liberal projects aimed at introducing economics-based tools for regulating water demand.

Both the evolution of this problem and the evaluation of different solutions have to be considered within the context of agrarian society and water management systems in the delta. Water management and related decision-making can be conveniently broken down into three levels. The upper level is where the overall policy and *strategy* are determined: long-term priorities are devised and roles are assigned to the actors. The second level is commonly referred to as the *tactical* level and includes decisions regarding the spatial and temporal allocation of water (typically at the seasonal level). Third is the *operational* level, in which short-term (typically weekly or daily) adjustments are done in order to rebalance or alter the effective distribution pattern. Each level defines a specific arena for negotiation, with specific actors and time horizons, where water management patterns shape the behaviour of users and vice versa.

The second section of this chapter presents a brief account of the hydrological regime in the Chao Phraya Delta, the evolution of a legal framework for water management, and the profile of declining water availability for irrigation. The third section describes the conventions evolved by the Royal Irrigation Department (RID) to allocate water in the basin (level 2), and how these have been undermined by farmer's strategies to secure the water for intensified cropping. The fourth section examines how the resulting inequality, and its potential for generating conflict, is managed at the local level (level 3). The last section examines how ideology shapes the different alternatives proposed in response to the challenges posed by the growing pressure on water resources (level 1).

10.2 Water and humankind in the delta environment

10.2.1 Hydrology and settlements

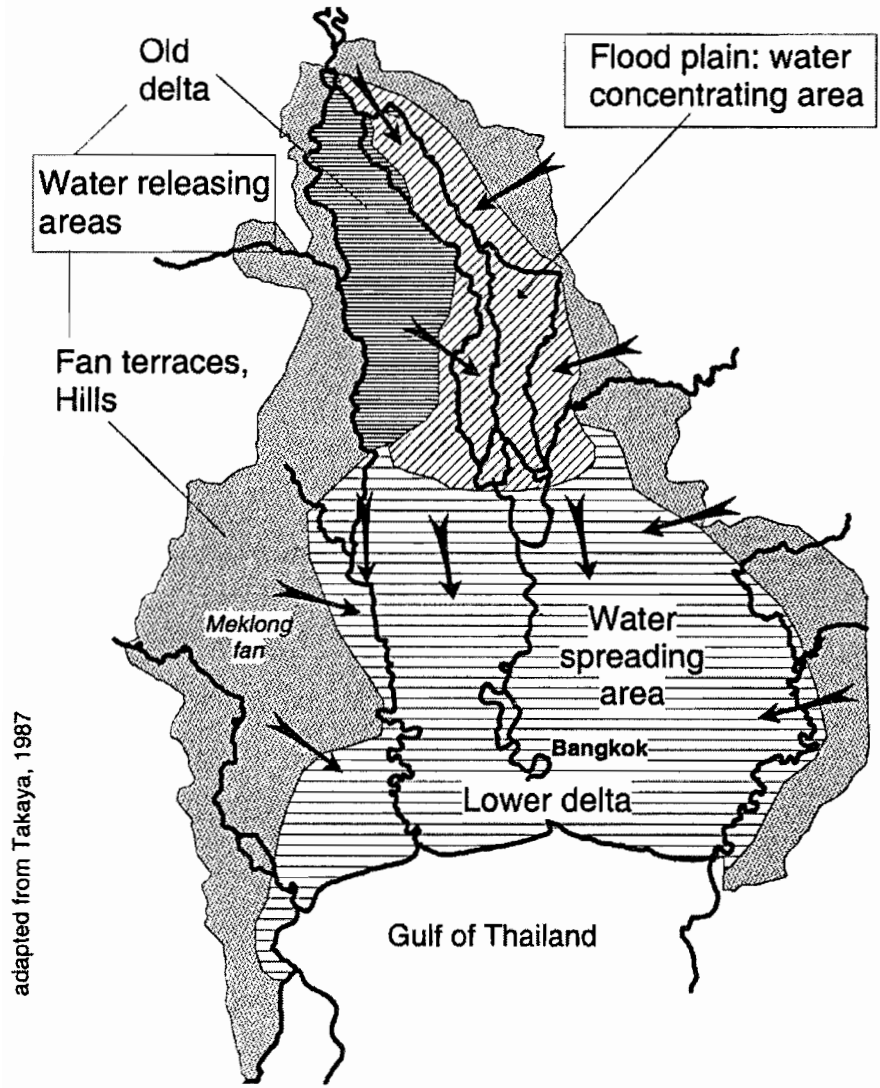
The Mekong, Chao Phraya, and Irrawaddy River Deltas, which share common landform features, have been reclaimed only recently—a telling indication that these natural environments were not particularly hospitable. From the Chao Phraya Delta, there is an endless litany of early travellers' reports that describe the "mosquito inferno" and the presence of wild animals (tigers, elephants, crocodiles) in this swampy savannah-like environment. What was the original hydrologic regime of the delta?

Run-off originating in the upper delta and on the lateral terraces merged with the flow of the Chao Phraya River in the floodplain of the delta (Figure 10.1, adapted from Takaya, 1987). With rising water levels in the main waterways, the drainage of the inner lands was impeded; at some point, water would back up into the tributaries, or even breach the river banks to flood the land. Floodwater would then reach the lower delta, a flat and broad tract of land. Flooding here was never high (one metre at the most), first because the area was large enough to accommodate it and second because the floodplain constituted a buffer, or flood-retarding and flood-relieving area (van der Heide, 1903). The coastal area, in its turn, offered a transitional brackish environment between the sea and inland that was baked in the dry season and washed out in the rainy season.

Not surprisingly, early settlements concentrated on the peripheral terraces of the delta and on its natural levees. These fertile strips of higher land bordering the numerous waterways of the delta were found chiefly in the upper delta, and along the Tha Chin and Chao Phraya River banks in the lower delta. The first Thai settlers, accustomed to wetland rice cultivation, started clearing the lowlands of the upper delta, and resorted to floating rice varieties where the depth of flooding was too high to accommodate normal deep-water rice. Although sensitive to flood vagaries, this system was best developed in the vast backswamps of the floodplain where immense rice fields were observed by travellers as early as the 17th century. Because of the vast tracts of land available and the limited population density, this cultivation system, characterised by a remarkable agronomic and technical adaptation to nature, proved highly efficient. In this *first adaptive phase*, water appeared as the gift of the Chao Phraya River.

With the shift of the capital to Bangkok-Thonburi, the lower delta, hitherto barely settled or reclaimed, became the focus of further reclamation efforts. This flat and swampy area had few raised areas for human settlement and was poorly

Figure 10.1 Natural water regime in the delta



and irregularly supplied by the natural water regime. Mere adaptive strategies proved insufficient. Instead, artificially-made canals were gradually excavated across the lower delta, aimed at spreading and prolonging the benefit of the flood, as well as providing domestic water, landfills for homesteads, and transport links. Some limited degree of control was provided by sluice gates, which could retain water at the end of the rainy season. This second phase can be termed the *excavation phase*.

The advent of the Greater Chao Phraya Project, initiated in the 1950s, began the third phase of land development, *the irrigation phase*. While water was formerly supplied to fields in the lowlands "from below" as a result of the natural swelling of the rivers and ponds, it began to be artificially supplied "from above" through a network of gravity irrigation canals. By a reversal of fortunes, the terraces and higher parts of the upper delta, hitherto viewed as unproductive, turned out to be in the best location, while formerly suitable lowlands were disadvantaged by poor drainage conditions. Farmers quickly realised the potential impact of the transformation of their physical environment, and the prospect of agricultural intensification translated into abrupt changes in the land and labour markets (Gisselquist, 1976; Montesano, 1992; Molle and Thippawal, 1999).

In summary, along with this progressive "artificialisation" of the natural environment, water shifted from a status of a freely flowing, natural and unpredictable element to that of a partly stored, controlled and distributed resource. The hydrologic regime partly turned into a hydraulic one. As farmers in the flood prone area commonly observe: "nowadays water has a master" (*thuk wanni nam mi chaokhong*).

10.2.2 Rights and laws

These historical changes in the development of land and water resources were reflected by successive water-related acts of legislation issued during the 20th century. But whereas conflicts over the ownership of land in the late 19th century triggered a gradual privatisation and commoditisation of land (see Feeny, 1989; Molle and Thippawal, 1999), water resources did not undergo a similar process. Because of its fluid, stochastic nature, and of its vital role in life, with no substitute, water does not lend itself to the definition of rights (Morris, 1996). In addition, until the completion of main storage dams in the 1960s and 1970s, water was abundant and accessing it was not an issue; only recently did the basin "close" as the potential water demand outstripped the available supply.

Natural waterways belong to the public domain (public property or public use), but the government cannot bar anyone from using water from them, as is typical in open-access resource systems. Water already taken from the river belongs to the person or entity taking the water, despite Section 1355 of the Civil and Commercial Code, which stipulates that "a riparian landowner has no right to withdraw water in an amount exceeding his reasonable need to the prejudice of other land abutting the same waterway." The first Act concerned with private irrigation was issued in 1939. It attempted to make private use of water for agriculture on more than 80 acres conditional upon official approval, and to empower officials to restrict these uses in the event of drought (Amnat and Worapansopak, 2000). This Act was ineffective as most farmers had areas of much less than the 80 acres (200 *rai*)[2] threshold and because means of water diversion or abstraction were technically limited. In the north, despite provisions allowing district officers to meddle in the traditional run-of-the-river *muang fai* systems, these People Irrigation Systems were in all likelihood affected only slightly and continued their secular activity (Cohen and Pearson, 1998).

With the development of storage dams, irrigation canals, and regulation facilities, new legal provisions appeared necessary. The Royal Irrigation Act of 1942 empowered the RID to develop, use, and manage water resources in irrigation canals, prohibiting the obstruction of flows. Gates were to be operated only by officers, who were also authorised to bar any person from withdrawing or using water from irrigation canals if it was perceived that such a withdrawal or use would cause damage to other persons (Amnat, 1997).

All of these legal provisions are typical of a context of open access where rights are loosely defined and the supply of free water is in abundance relative to the need. Although widely regarded as outmoded (Amnat, 1995), this legislation has not been updated to address the radically new challenges posed by the closure of the basin. Such a situation, commonplace in developing countries, is highly revealing of the daunting difficulties and political risk involved in redefining the patterns of water use (Allan, 1999).

10.2.3 Defining water scarcity

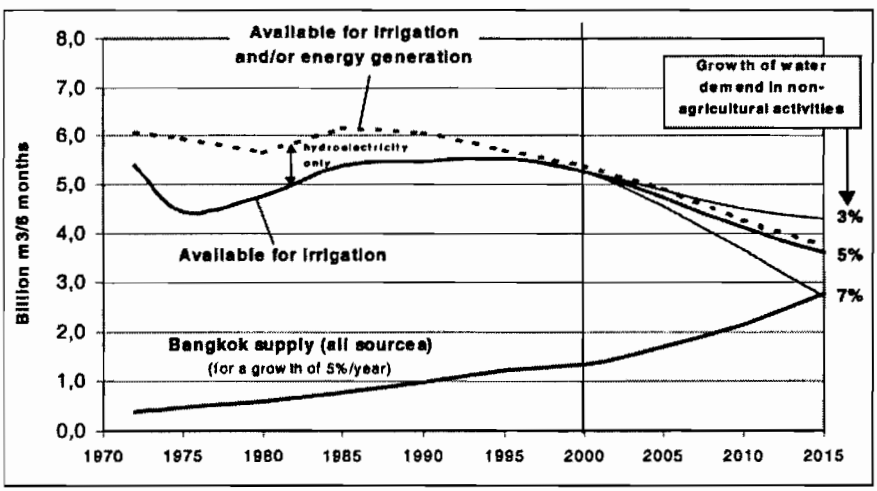
Who is entitled to use water in a situation of relative scarcity where demand far exceeds the available resources? During the rainy season, although episodic dry spells are sometimes experienced, irrigation schemes have little difficulty supplementing crops and users with the needed water. In fact, water inflow comes

mostly from rainfall or from uncontrolled (i.e., not captured by reservoirs) natural side flows in the river basins, upstream of the irrigated areas. Overall, rather than supplying water, water management is often geared towards limiting excess flows and flooding. In other words, water scarcity is not an issue in the wet season. The question is thus only relevant during the dry season (January–June) when in the northern region the natural run-off in the small basins is insufficient to meet the increasing demand, and when in the delta water stocks in storage dams are not sufficient to meet all downstream uses.

Pressure on water is neither felt evenly across the countryside nor throughout the seasons. Long-term trends are not readily observable as they are obscured by high year-to-year variations in the amount of water available in the dams for use in the dry season. It must, however, be made clear that as agriculture is eventually given the "leftover" water in the system after all other requirements are met, its share is bound to decline in line with the decline in dams' inflows and the growth of non-agricultural uses (especially in Bangkok).

Figure 10.2 presents the evolution of dry-season water supply and demand in the delta in broad terms[3] (assuming no additional source of water is tapped). The amount of water available increased in the 1980s because of better control of

Figure 10.2 Projection of average water supply in the dry season (middle/lower basin)



unproductive dam releases in the wet season (more water stored). Such releases have also been better controlled in the dry season (the difference between the two curves is narrower). However, because such potential gains are now limited, the volume available is deemed to decline in the future[4]. With growth of the Bangkok Metropolitan Area (BMA) demand at 5% per year[5], the water available for dry season agricultural activities will be cut by 45% between 2000 and 2015. The decrease is highly sensitive to the rate of growth of demand in the upper basin (+0.6 billion cubic metres [Bm^3] over 15 years) and in the BMA. Keeping in mind the almost 10% yearly increases in BMA demand prevailing before the 1997 economic crisis, it can be seen from the chart that even more realistic rates of around 7% will have a dramatic impact on the remaining water available for agriculture. Demand has levelled off in the post-crisis economy but assuming a few more years of diminished demand only shifts the curve by the same amount of time and does not invalidate the trend in the mid-term. In all cases, the overall picture is one of a significant decline in water supply, at least in the absence of additional water resource development projects.

10.3 The current allocation of water: interventions and regulations

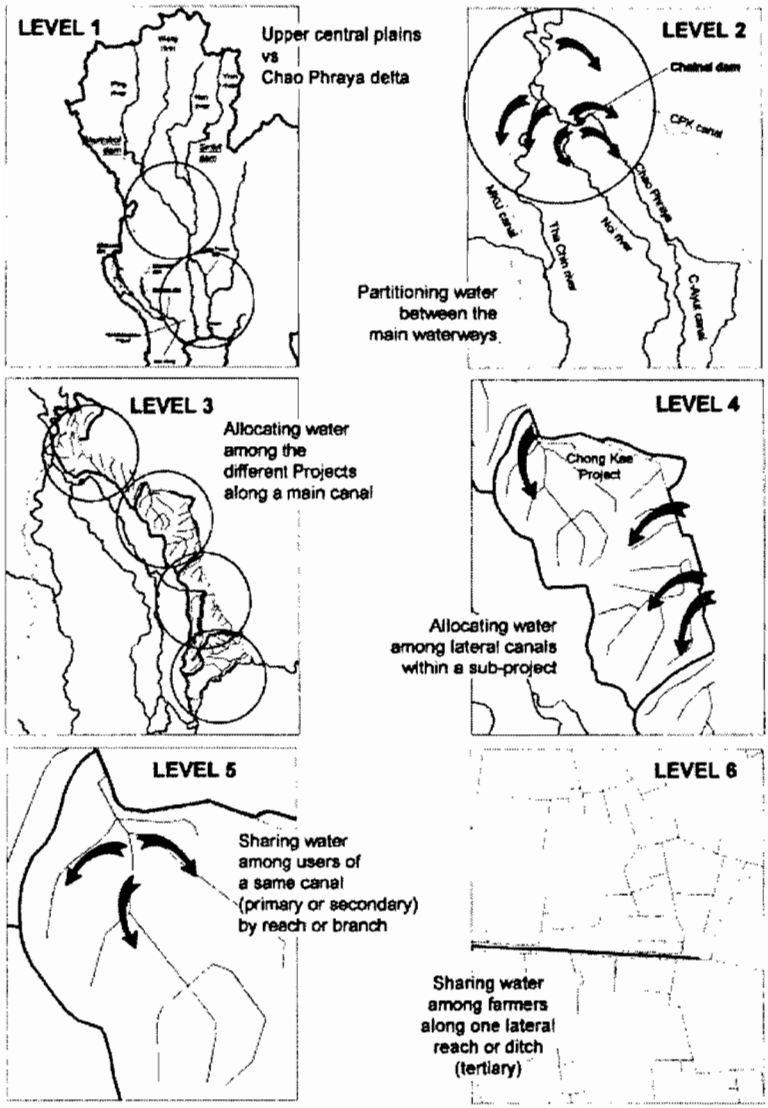
We will focus here on the irrigated areas located downstream of the two main storage dams (see Map 1 in Appendix). The irrigated areas can be conveniently divided into two groups: (1) the middle basin (between the dams and Chai Nat); and (2) the lower basin, that is the delta proper. We will examine how, when, and how much water is released from the dams, who its users are, and to what extent the regulation capacity is instrumental in defining who they are.

10.3.1 A multi-layer process

The *tactical* level is where the seasonal allotment of water is decided. Over its course from the reservoirs to the farm plots or other uses, the water stream is successively divided at different levels of the hydraulic network. At each level, different factors defining the patterns of allocation and use come into play. For the sake of simplification, six successive levels can be distinguished (Figure 10.3).

1. The first level is that of the basin. The inflow into the dams, and consequently their water stock, obviously depends on how much water flows in the upper basin and what percentage of it is used there. Similarly, after water is

Figure 10.3 Water allocation as a six-level process



released from the reservoirs, only the portion that has not been used in the middle basin will be available for the delta downstream.

2. The second level is that of the delta. The Chai Nat Dam diverts the flow entering the apex of the delta and divides it into smaller portions directed to each of the waterways branching off the Chao Phraya River at that point. Six of these waterways are minor canals, three are trunk canals, and two are major rivers serving as canals (the Tha Chin River and the Noi River).
3. The third level is that of the main canal, which successively serves several irrigation units (called projects), among which water must also be apportioned. In most cases the inflow in the main canal is not sufficient to supply all projects according to the potential demand.
4. The fourth level is that of the project. The amount of water entering the project is also generally insufficient to meet demand and it is necessary to allocate the inflow to some of the lateral canals within the project.
5. The fifth level is the lateral canal level. The inflow into the canal serves the different reaches of the canal or otherwise, depending on the policy adopted.
6. The sixth and last level is that of the ditch (tertiary canal) which branches off the lateral and along which farmers must share water in order to supply their plots.

It is important to stress here that the above hierarchy of levels chiefly applies to the upper delta, which is supplied by a conventional network of gravity irrigation canals (see Map 3 in Appendix). In contrast, the lower delta is largely "unstructured." It is a flat area criss-crossed with thousands of interconnected excavated channels of varying size (totalling approximately 14,000 km in length) that are mainly supplied by water channelled from Chai Nat through the Noi River and other canals (see Map 3 in Appendix). The lower delta is also referred to as the "conservation area" because water is effectively trapped in this web of channels and is prevented from flowing to the sea by a series of dikes and regulators located along the seashore. Hydraulic regulation in this flat part of the delta is limited. Managers focus on maintaining a water level sufficient to allow transportation and pollution control (some flow is necessary to flush waste water out to the rivers). Users pump individually from one of the channels adjacent to their land. This is done on an individual basis with no coordination. If the overall water abstraction exceeds the available water then the water level drops and the first areas to be affected are those which are served with narrower and shallower channels, and which are most distant from the waterways that receive the inflow from the north.

In practice, the RID has little leverage on users in the lower delta because it cannot control them and cannot afford to let the conservation area run dry.

10.3.2 A top-down semi-controlled allocation process

Access to water at present can be typified as mixed. It includes a degree of open-access resource (as people pump freely in rivers and can hardly be controlled when they pump from irrigation canals) and centralised control (there is water in a given waterway only if managers have released water into it, at least in the dry season)[6]. The whole allocation process can be considered to be centrally organised with the RID as the chief player (however, as will be shown later, its degree of control over the six steps of the process is varied). The RID's theoretical planning for the allocation of water distinguishes a ranking of priority between the different uses:

1. Domestic use (especially the BMA, with some industrial use);
2. Controlling salinity intrusion at the river mouth;
3. Irrigation of orchards, vegetable, and shrimp farms;
4. Rice cultivation;
5. Inland navigation;
6. Energy generation.

Energy is generated in the hydraulic power plants when water is released from the reservoirs. Inland navigation and salinity control are ensured by maintaining a minimum flow along the river's course and at its mouth. The diversion for the BMA is located in the north of Bangkok and requires an inflow of 45 m^3/s. Except for navigation, these uses receive priority. This is generally ensured by controlling the release from the storage and diversion dams (see Map 1, in Appendix). Thus, agriculture is the sector that is most affected by allocative decision-making at the different levels.

While approximately five million *rai* of land in the delta are used for dry season rice cropping, only three million, on average, will succeed in growing a second (or third) crop. This is the fundamental issue that the allocative process has to address. To make the matter more complex, decision-making has to adapt each year to two main fluctuations. The first concerns supply and can be represented by the available water stock (AV) in the dams on the 1st of January, at the onset of the dry season. This stock may vary between roughly 5 and 12 Bm^3, which, considering carry-over stocks that must be ensured at the end of the dry season, yields a usable target volume (TV) of between 3 and 10 Bm^3. The second fluctuation is the

"intensity" of demand and is strongly dependent upon the price of rice (in the short term) and on agrarian pressure (in the long term). While the potential demand remains at five million *rai* (and much over this value if we consider triple cropping), the degree of mobilisation of farmers at the different levels of the negotiation process increases when rice prices are high.

What are the official (or theoretical) rules used to guide the spatial allocation of water to the (too) large area capable of growing a dry season crop? The areas which do not grow wet season rice (e.g., the West Bank[7]) are given first priority; next are considered areas (if any) which have experienced crop loss of over 50% in the previous wet season and are greater than 300 *rai*. Water is then allocated to those who are "in turn" and, if any remains, to the areas with fully developed on-farm infrastructures ("land consolidation"). This policy followed a rotation which had been established in order to cope with the gap between supply and demand: each project defined two sub-areas which were irrigated every second year, with the "out-of-turn" half receiving only intermittent low flows, defined as domestic water (or *upaphok boriphok*, water intended to meet the needs of villages such as backyard orchards, animal farms, small factories, etc). This rotation was followed only loosely and then abandoned in the early 1990s, when water shortages made it impracticable.

We may now turn to a brief description of the formal water allocation process in the basin (for more details, see Molle *et al.*, 2001a). Each November, a policy meeting is convened with representatives of RID, Electricity Generating Authority of Thailand (EGAT), Office of Agricultural Economics, Department of Agricultural Extension, and other organisations concerned. This meeting sets the target volumes and target areas for the whole country[8]. For its part, the RID (through its regional offices) consults the provincial agricultural services and comes out with a crude repartitioning of the target cropping area for each province, with areas broken down according to crops (rice, field crops, trees).

At this point it is interesting to note the presence of the provincial administrative level in the process. While water distribution is primarily concerned with spatial units derived from the structure of the hydraulic network (whereas hydrology is concerned with water basins), confrontations arise due to the interests of the territorial administration, and of local political representatives alike, who wish to control the benefits derived from water allocation. The RID has to conform, at least officially, to a politico-administrative process in which it is accountable to the provinces for how much water will go (or is supposed to go) to each of them. This is illustrative of the pervasive predominance of the three-tiered centralised Thai

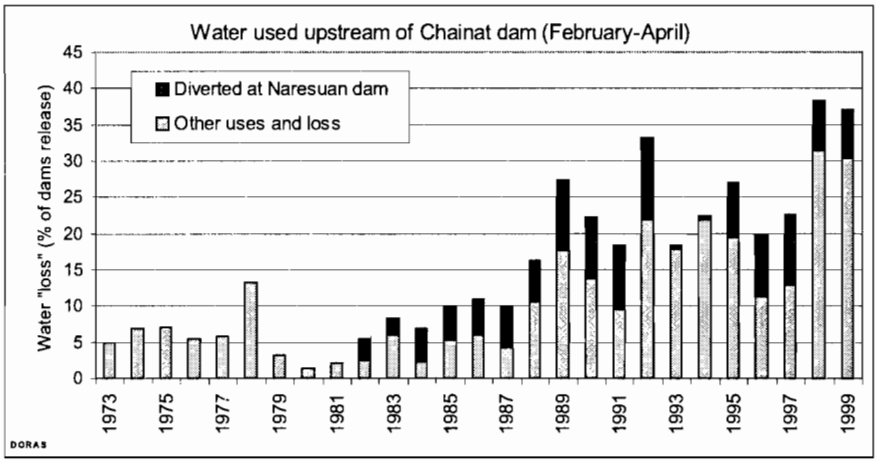
bureaucratic "polity" (Bangkok > province > district, with its extension towards the sub-district level; see Nelson, 1998a) which is apparent in several other circumstances[9].

The apportioning at the macro-levels (1 and 2 in the classification given above) of the TV (say, for example, 6 Bm^3 for the Chao Phraya Basin) is decided by the RID Central Office. This allocation is further specified by a weekly timetable (used by EGAT to plan dam releases and energy generation) that details the allocation between the main waterways branching off at Chai Nat. Along the different main canals (level 3), water is allocated by the RID Regional Offices[10], while levels 4 and 5 are the responsibility of the projects. All these planning decisions are made in a straightforward top-down and supply-driven fashion by the RID. The pre-season allocation process is obviously the first arena where some division of the "cake" takes place. Routine consultations are made with provincial authorities but the allocation of respective shares to the different main canals (surprisingly) is done with little negotiation, despite all representatives making sure that there is no drastic revision of the basic *status quo* defined by past-year experience. This suggests that the division operated by the RID already embodies the relative weight of the provinces concerned (see below), and that the loose nature of the schedule also makes cut-throat negotiations futile as real deliveries are unlikely to dovetail with the planned ones[11].

This theoretical planning will of course be altered by "real world" constraints of several kinds. Three main factors drastically curtail the RID's effective control over water distribution in the basin. First is the lack of control upon the middle basin where water is abstracted by 300 pumping stations managed by the Department of Energy Development and Promotion (DEDP), and diverted to RID irrigation projects (which encompass approximately 700,000 *rai*). Figure 10.4 shows an estimate of the percentage of dam releases abstracted or diverted in the middle basin. Discounting the discharge diverted at Naresuan Dam (which is destined for the Lower Nan area), other uses have grown spectacularly in the last 10 years. This diversion includes use in DEDP and RID projects, where the actual volumes far exceed official diversion figures, and uncontrolled private and collective pumping.

The second factor is the "de-regulation" of cropping calendars which has resulted in a loss of RID control over water abstraction. Water management is usually characterised by a scheduling which reflects decisions made on allocation and which is supposed to provide users with information on when they will get water. But over the last decade, cropping calendars have changed through the use of secondary water sources (notably tube wells in the upper delta), the substitution

Figure 10.4 Water abstraction in the middle basin (dry season)



Source: Molle *et al.* (2001a)

of wet broadcasting for transplanting (no nursery needed, cropping can start as soon as water is available), and the farmers' tendency to start dry season cropping just after the rainy season crop, thus capitalising on field wetness and on water still available in the waterways[12]. The RID's rule-of-thumb conventions for allocating water (by channel and timetable) have not adjusted to reflect these changes in cropping calendars. Farmers then resort to various forms of direct action to resolve the difference between their water needs and the RID's decisions. They invest in pumps. They plant early and exploit the RID project officers' known reluctance to risk the loss of standing crops. They call on politicians to pressure RID to increase deliveries. These strategies will be discussed in more detail below (Section 10.4). The combined result of these various actions is a loss of RID's control, and a tendency towards greater inequity in water distribution.

It appears that the lowest one is ranked in the different levels of the allocation process, the more uncertainty in water supply is experienced. This explains why project officers pay little heed to the formal schedule of supply to their project; it also explains why, most of the time, the schedules prepared by the projects are not considered when regional offices plan their weekly schedules.

Spatial inequities in water allocation can be judged from the study of cropping intensity in the different projects of the delta over the last 20 years carried out by

Molle *et al.* (2001a). The western part of the upper delta and the West Bank stand out as the most intensive rice growing areas; some areas, in particular, have been practising triple cropping for the last 10 years. The West Bank owes its higher cropping intensity to its favourable location, to additional supply from the Mae Klong Basin, and to the impossibility of controlling farmers' water use. The western upper delta, for its part, has benefited from several factors. The first one is the priority formerly given to land consolidation areas, which can be found in the Borommathad, Chanasutr, Samchuk and Don Chedi projects (see Map 3 of the Appendix). As farmers in these areas had to reimburse part of the investment and also had more productive land, this was a justification for preferential allocation. Second, the area is, in its upper part, provided with numerous tube wells which allow early cropping (sometimes forcing special allocations from RID). Third, the area is very suitable for High Yield Varieties cultivation (hence for dry season cropping)[13]. Last, the province of Suphan Buri has a well-known leverage over the Ministry of Agriculture through its governor and some of its MPs, so special water requests are readily answered[14]. In the course of time, all of this contributed to shaping a preferential pattern of allocation towards the western part of the delta, which is implicitly incorporated in the average breakdown used by the RID, and tends to be taken for granted.

What is the outcome of such spatial heterogeneities? A study of three villages with contrasting levels of access to water (translating into different cropping intensities), reported by Molle *et al.* (2001c), showed drastic discrepancies in the productivity of land and corresponding crop incomes, but it also showed that local farming systems have evolved in line with the relative scarcity of water. Because opportunities to diversify crop activities (principally animal farming and off-farm activities) were available, the village economy was rebalanced to some degree, partly offsetting the impact of the unequal allocation. This was possible because of good linkage with nearby urban markets and because of the development of the non-agricultural sectors. The general evolution of the agrarian system in the last two decades therefore has been dictated by both water allocation policies and the evolution of the wider economy. In turn, this agrarian evolution conditions whether these policies are socially acceptable or not; a lack of opportunities outside agriculture would have probably raised the pressure on water above observed levels.

The diverging criteria and preoccupations of politicians/local administrations on the one hand, and of water managers on the other hand, appear clearly in times of drought. Uncomfortable with seeing water supplies reduced, politicians lobby

the government, in particular the Ministry of Agriculture, to obtain a higher target area. At the end of 1998, for example, the dams were at their lowest levels with only 3.9 Bm^3 available for the 1999 dry season. Objective technical considerations led the RID's Central Office to define a "zero *rai*" option, due to concerns about the impact a severe water crisis would have on the water supply of Bangkok. This technical stance was challenged by a more politically oriented one; the farmers' demand was particularly high at that time because of attractive rice prices, and this pressure ended up being passed on to the governmental level. On such grounds, the plan was reviewed and a target of 1.9 million *rai* was set for the basin (with 1.7 for the delta). Knowing about the poor status of dam storage as early as November and about the foreseeable prohibition of dry season cropping, many farmers rushed to start an early crop in November or December. This generated an unusually high water demand in January, jeopardising the allocation plan and clearly threatening the supply to Bangkok in case of another catastrophic hydrologic year. The balance at the end of the season was appalling: the total area planted soared to 3.4 million rai (compared to the plan of 1.9 million) including 1.2 million *rai* of triple cropping. In fact, the water situation eased because of abundant rainfall in April, enticing farmers to grow a late dry season crop which contributed to this high figure. But matters could easily have evolved towards a much darker scenario.

This example shows that the absence of clear-cut technical standards for the definition of the TV allows politicians to stretch the dam releases to extremely risky levels. (Ironically, the fortunate heavy rainfalls of April–June 1999 and the high cropping area recorded may have reinforced the impression that interceding on the farmers' behalf had been the right decision!) A few politicians, most particularly those linked to the political parties controlling the Ministry of Agriculture, wield significant power over in-season adjustments of allocation, especially in periods of crisis when planned values no longer provide any guideline.

10.4 Water distribution: individual and collective strategies

The water effectively received by farmers is of course partly predicated upon the tactical decisions taken "upstream." However, at the local level, several means exist to readjust water deliveries. When we get closer to the final plot, the relationships between farmers and those in charge of water (the RID's field staff and their immediate superior) also become more personalised. In addition farmers must find ways to share and distribute water locally, especially in situations of shortage.

10.4.1 The RID and the farmers

Let us first examine how farmers make the decision to engage in dry season cropping if there is such wide uncertainty about the forthcoming supply. Each project organises meetings at the zone[15] level in order to inform farmers about the cropping area allocated to their zone. This is generally done together with the gatekeepers, zone men and sub-district extensionists. Rather than focusing on the figure itself, farmers first give attention to the overall policy adopted each year: "it is prohibited to plant," or "there is little water this year," or "this year, water is good." This forms the basic "hearsay scale" on which farmers rely in order to decide to engage in cropping or not. The farmers also take into account the planned cropping area but they await further advice from officers to better qualify the risk. The officers often suggest that a larger area can possibly be planted but that the RID cannot be responsible for possible water shortages. The way this is put is also interpreted as an encouragement rather than the opposite.

According to this crude information and to their experience, farmers assess the probability of getting water down to where they farm (this is of course very location specific). In practice a "glove pattern" can often be observed, where green "fingers" of cultivated land follow the courses of waterways. The length and width of these fingers reflect the relative level of water availability. It must be noted in passing that engaging in rice cropping can hardly be decided in a purely individualistic way. Those who start a sole crop (often relying on a well or a pond) face severe pest pressure (specifically from rats) and are likely to lose most of their crop. In addition, seepage to adjacent fallow land provokes surges of weeds and complaints from neighbours. Thus there is a collective dimension in local decision-making.

In normal situations, project managers try to ensure a continuous flow to all their lateral canals, even though there might be a rotation between two or three reaches within a given lateral. If the policy[16] is to follow a year-by-year rotation in which only half of the project is supposed to grow rice, then the flow to the other half is maintained at a lower level, but rarely cut off completely, at least in the head reach. The way supply and demand adjust to one another in a context of rather high uncertainty is not readily obvious and cannot be easily reduced to either the classically defined demand-driven process (where supply is adjusted to a given demand) or the supply-driven one (inflows are fixed and known in advance and the irrigated area is calculated accordingly). A careful analysis shows that it may in fact be a blend of both, with a delicate and fluctuating dosage of ingredients, and ad hoc interventions.

Unless rice prices are really depressed, farmers usually attempt to grow as large a dry season rice area as possible, and a triple crop if this can be done. They must evaluate the risk of doing so according to the information given by the RID and the media. As mentioned earlier, by starting their crop on large areas (by resorting to secondary water sources or by using the water available at the end of the wet season), they may force the RID to further supply their crops until the end of the cycle. In case of drastic shortage, they usually request local politicians to intervene in order to obtain an extra supply. In general, this is done through MPs belonging to political parties with influence at the government level, or through other influential individuals. Interventions have to be made at the highest level because such increases in supply are eventually dependent upon incrementing the discharge at the head of the main canal concerned, at Chai Nat, which is under the control of RID's Bangkok Central Office.

RID project officers have mixed feelings about these interventions. They may feel somewhat weary of having outsiders meddling in issues within their responsibility, but they also sometimes (consciously) trigger them by explaining to farmers that the cause of their problems lies further upstream in the basin and is beyond their reach.

RID project officers both want to serve their farmers[17] and to minimise risk. In some instances the second aspect may override the first, and officers are likely to adopt strategies aimed at limiting the expansion of the cropping area. Occasionally, they are found opening check regulators of canal middle-reaches, allegedly to provide water for domestic consumption to downstream areas, but in reality to prevent upstream areas from growing too large in area, which would dramatically increase the risk of future shortage. For officers, shortages mean farmers' unrest, political interventions, and hierarchical superiors demanding explanations, all of which must be avoided as much as possible. They have some margin of flexibility because of a degree of slack in water allocation; they may sometimes deliver extra and unreported water supplies, by setting pumps along the rivers or by disguising the releases as *upaphok boriphok* (domestic consumption) water. They may also under-report water use when quotas are tight.

One of the main difficulties faced by the RID is the management of low flows in canals that have been designed to provide gravity supply only at or near full supply. By investing in an impressive pumping capacity to overcome water scarcity, farmers have escaped the main constraint of gravity irrigation networks and have also tapped secondary water sources (drains, ponds, aquifers). If operational

constraints experienced by the RID have forced farmers to develop their pumping capacity, it is all the more true that—in return—this has discouraged whatever regulation improvements RID would have otherwise been pushed to achieve. Rotational arrangements are part of the paraphernalia but as their implementation entails significant transaction costs, RID officers understandably prefer the actual *status quo* according to which their role is to ensure water in the canal, even at a very low water level, while farmers have implicitly integrated the fact that they will often need pumping devices to access water.

On the negative side, managerial control has effectively been substituted by increased monetary costs (pumping equipment and operation), the burden of which is borne by the farmers. A more subtle detrimental aspect of this process has also been the embracing (or the strengthening) of a pervasive individualistic concept of gaining access to water. Although collective arrangements are sometimes necessary and implemented (see Molle *et al.*, 2001b), there is ample evidence that individual pumping has implicitly reinforced the acceptance of the first-pumping-first-served principle, and that locational advantages necessarily translate into privileged access to water. "Head enders" can pump water as soon as it appears, in total independence from any collective rotational arrangement or other efforts aimed at raising the water level in the canal or increasing equity. The spreading acceptance that farmers along the canal do gain privileged access to water chokes claims of greater equity and fits the RID's concern to control the expansion of the cropping area.

Political interventions aside, what additional leverage do farmers have to elicit preferential water supplies from the RID? It is commonplace that farmers in irrigation systems worldwide tend to bribe field staff to get undue access to water. In the present Thai context, although gate operators do sometimes receive some gifts to turn a blind eye to a surreptitious night opening of a gate, such practices are generally limited and account for relatively little of the overall malfunction. Mention must also be made about the link between uncertainty in water supply and possible rent-seeking behaviour. It has been postulated, and supported in particular by some Indian cases (Wade, 1982), that managers deliberately engineer unreliability in order to exact bribes from farmers willing to ensure preferential allocation. This argument does not apply in the context discussed here and, all in all, corruption does not appear as widespread here as is suggested by the literature on South Asia[18].

The objectives, constraints, risks and trump cards of both farmers and RID project officers are schematised in Table 10.1.

Table 10.1 Aspects of farmer-officer interactions during the dry season

	Farmers	RID project officers
Objectives	Grow as much rice as possible, in area and frequency	Serve farmers, while trying to limit the cropping area down to low-risk standards Limit complaints from farmers and from superiors
Strategy	Force the RID to ensure sustained supply by starting a crop when water appears or with water from other sources On-farm water storage, wells, drains	Limit supply to control the spread of the cropping area Fix a low "commitment" target area, as a protective measure Refer to water supply as *upaphok boriphok*
Constraints	Lack of on-farm infrastructure; pumping needed Rats, water seepage, in case of isolated cropping	Limited control over the flow allocated to the project; fluctuations and uncertainty of inflow
Risk	Excess areas, beyond the target, may face water shortage, reduced yields or crop loss.	Water shortage Complaints, protests from above and below
Trumps	Intervention of politicians Low sensitivity of rice to spaced out supplies Secondary water sources	Forward request/complaint to higher levels Divert non-computed water to drains in case of quota restriction; request special supply in case of shortage; pump extra water from rivers
Pressure-reducing factors	Low price of rice. The risk is higher and the pressure on water reduced. Rainfall	Same as farmers

10.4.2 Sharing water among farmers

Sharing scarce resources without clear negotiated and enforceable rules often gives way to conflicts (Ostrom, 1992). Despite the absence of such formalised rules, it is possible to observe and distinguish some behavioural patterns apparent in cases of conflicts incurred by the lack of water.

- The first and most common reaction is conflict avoidance, to adapt to the situation and to search for other opportunities ("*tham jai*" 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-agricultural activities and keeping agriculture as a secondary activity, or even giving up farming.
- The second reaction is to cooperate and to try engaging in some collective action ("*chuai kan*" option). This is generally only possible at the local level; farmers will group to pump at the head of the canal or will agree on some rotation within the lateral (under the supervision of RID field staff). This may also include the collective maintenance of a ditch.
- The third 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 disruption. To lose a little is seen as a much more desirable outcome than to face public outrage or to damage local social relationships. Intermediation allows the avoidance of face-to-face confrontation and lowers the probability of losing face. It also avoids taking the matter to the district level, a solution abhorred by most villagers.
- The fourth is the *patronage option*. Farmers (in general grouping together) will try to obtain a change in their favour by approaching politicians with adequate power who are expected to behave as patrons. These patron-client relationships are common in Thai society (Hanks, 1975) and easy to observe in political life (Arghiros, 1992).
- The last reaction is (unresolved) open conflict, but this is very seldom the chosen option. It has been observed in some case of latent conflicts between villages, sometimes driven by ethnic differences.

These options deserve a few comments.

Farmers in the delta display a very pervasive acceptance of inequalities. The question of how a farmer feels about growing only one crop while canal head-enders can grow two in most dry seasons is always shrugged off with some

laughter (see Molle *et al.*, 2001b). The deep-seated feeling that one's situation is not socially determined 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 perceive as inequities[19]. Asked to comment on wealth disparities among farmers, villagers also rarely display any kind of aggressiveness or strong reaction. This strongly implies that the most "natural" and common option is the first one.

Conversely, this acceptance of inequalities is paralleled, in a more positive tone, by widespread sentiments of tolerance. Farmers in the Don Chedi Project (west of the upper delta), for example, are widely sympathetic to fellow farmers located outside the irrigated area who are developing large-scale diversion of the same canal water which is already insufficient for their own area. What is an obvious source of new competition, surprisingly, is not perceived as such. It is not hard to find examples in the literature in which similar situations elsewhere escalate into severe conflicts.

If inequity may appear morally sanctioned, one should not infer that fatalism precludes challenging the existing situation. In some cases, there appears to be a clear limit on the degree of inequity that is socially acceptable. The high pressure on water in the dry season experienced during the last four years triggered a series of rotational schedules in many projects of the upper delta. In 1997, dry season cropping rocketed, boosted by high rice prices and large water supplies (partly due to a policy to compensate for some damage provoked by flooding in 1995 and 1996). Because of the dramatic increase in water demand, unusual protests arose from farmers located at the tail end of canals who were afraid of being deprived of water, as head-end farmers were starting to engage in triple cropping. This led to the intervention of politicians and provincial authorities who became involved in the setting of rotational arrangements for water distribution. With the participation of several segments of the administration, including the police, these ultimately short-term arrangements proved successful in ensuring more equity.

Several important lessons can be learnt from these arrangements. First, they clearly indicate that higher pressure on the resource can lead to unprecedented mobilisation of farmers in unfavourable locations. Second, the RID is no longer in a position to enforce rotational arrangements at any scale and needs the support of the provincial authorities and of the police to make them work, especially when they cover an area overlapping several districts or provinces. In contrast, politicians can show their influence by acting as brokers, while the local administration lends state legitimacy to the move and backs enforcement through the involvement of the police. Third, despite showing that increased equity could be brought about by

collective organisation, these rotations were nevertheless short-lived and disappeared as soon as the situation returned to "normal."

Collective action therefore appears to be of limited significance. 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, 1998a and Chapter 13). The individualism of farmers in the central plain and their lack of propensity to act collectively are thus partly rooted in the region's history. However, there are a few examples of endogenous contractual arrangements for water management which are activated when the conditions demand and allow it.

Depending on the water status (as defined by the discharge to a given secondary canal relative to the planted area), farmers may resort to short-term informal agreements, such as waiting for the water to fill the entire canal before starting pumping, rotations between two or three reaches of a canal, pumping collectively at the head of the canal, etc. These arrangements are often proposed by RID field staff (zone men) or by some influential local leader (Molle *et al.,* 2001b). If supply is nearly as great as demand, or contrariwise drastically low, no such arrangement is possible. Rotations typically occur in intermediate situations, where potential gains from collective action are sizeable. Collective simultaneous pumping at the head of a secondary canal and along its course is an interesting example of a complex arrangement. This situation occurs when little or no gravity inflow can be obtained in a given lateral. Farmers therefore close the head regulator, set a number of low-lift axial pumps at the head of the canal, and pump together. As the flow is insufficient to raise the water level in the lateral, a second pumping operation is needed at the plot level. Combining these operations, including organising the queue at the canal head and ensuring the fair repartition of water along the canal, is achieved rather smoothly with a wide acceptance of observed inequalities so long as they are due to topography or other site-specific factors and not to outright cheating. This demonstrates that farmers can respond efficiently to a rather complex organisational need.

While there is a propensity to individual behaviour and a lack of strong built-in social incentives for collective action, farmers in the delta are not deprived of the social capital needed to act collectively. The possibility of lasting arrangements is undermined by the great uncertainty and fluctuation of water supplies. Individual pumping provides a socially accepted means to access water on an individual basis. Farmers' collective mobilisation can only be obtained if there is a real

decentralisation of power and decision-making, although it also requires a series of other site-specific factors (Molle *et al.*, 2001b).

4.5 Policy: the web of ideological idioms

Water policy is at present a prominent issue on the political agenda of many countries. It appears particularly confrontational in a context where water resources are in a transition from the status of common-pool resource in sparsely populated agricultural areas, to that of a collective resource to be managed in a more complex world that ought to be respectful of both the environment and of basic equity and efficiency standards. In Thailand, as in many other places, several schools of thought have developed to face the challenges posed (Molle, 2001a). They include: 1) NGOs and social activists attached to the notion of water as a natural gift and a human right; 2) international agencies and their followers, geared towards implementing in-depth reforms supported by economic regulations; 3) administrative bodies arguing for an increased coordination between departments and more managerial power; and 4) line agencies, consultants and construction companies, committed to more water resource development in order to match demand.

From the confrontation of these points of view[20] results a web of contradictory arguments where custom, power, and ideology, veiled or otherwise, form a complex and fascinating mix. Despite toying with a water law for over a decade, and despite the sense of urgency derived from water crises and from the externalities of mismanagement (shortages, pollution, land subsidence in the Bangkok area), the government is understandably reluctant to address an issue with high political risks. Defining water rights in a way that amounts to re-allocation will generate political stress. As Allan (1999) has put it, "regional politicians have a powerful intuition that economic principles and the allocative measures which follow logically from them must be avoided at all costs. . . . Governments are more likely to rely on the exhaustion of the resource to be the evidence that persuades water using communities that patterns of water use have to change." This is reminiscent of the progressive sinking of Bangkok, which entails horrendous costs in flood protection and flood damage, and has been denounced for almost three decades. Corrective measures aimed at raising the price of underground water to the level of tap water have been hitherto successfully challenged by the influence of the Federation of Thai Industries (*Bangkok Post*, 2000c).

If the inertia of the administration can be ascribed to political risk and opposition from the business sector, it is also due to the fragmentation of responsibilities

among different departments, the vulnerability of departments to political meddling, and the inadequacy of the legal apparatus (Christensen, 1994). Pramote Maiklad (the former Director General of the RID) complains that "everybody knows there is a problem but they want someone else to do something about it" (Cumming-Bruce, 1999). A high-ranking officer of the Ministry of Agriculture admits that "the agencies are unable to co-ordinate their policies because they are *supervised* by different parties in the ruling coalition" (*The Nation*, 2000 June; emphasis added).

10.5.1 Neo-liberal solutions

Regulatory measures for the water sector have been repeatedly proposed by consultants and international agencies, most notably the ADB. A detailed scrutiny of the underlying rationale, however, reveals intriguing gaps between the theoretical framework advocated and the real world (Molle, 2001b). Upon the journalistic assumption that water efficiency is allegedly as low as 30% are built misleading rationales aimed at justifying the pricing of water. But this assumption ignores the real functioning of a closed water system like the Chao Phraya Delta, where it can be shown that only 12% of the controlled supply in the dry season is lost to non-productive uses or is uncommitted (Molle *et al.*, 2001a). Even at the plot level, efficiency reaches high standards (60%), partly because the cost of pumping discourages overuse. The rationale for cost recovery is equally unconvincing. Subsidies are only one element of a broad policy matrix and cannot be evaluated in isolation from taxes and other government interventions. Schiff and Valdés (1992) have shown that agriculture in Thailand has been heavily taxed and, in the overall game, has been on the giving rather than receiving end. This implies that the "free water" subsidy can be seen as a small compensation. Low rice prices also benefit urban populations and indirectly the other sectors of the economy. The alleged "huge drain" that irrigation operation and maintenance expenditures impose on the national budget amounts to only 0.16% of the national income and it would probably not be difficult to find other "drains" with much less economic and social impact on the Thai population (Molle, 2001a).

The influence of mainstream neo-liberal economics is also apparent in some proposals geared towards establishing water markets (TDRI, 1990). Even a cursory examination of the institutional, legal, and political situations indicates that these proposals are blatantly at variance with the background of legal consistency, administrative accountability, and law enforcement needed (Sampath, 1992). Indeed

the true situation is that "capability in both management and regulation is limited and the social and environmental risks of getting it wrong are considerable" (Morris, 1996). Ironically, concerns over sectoral re-allocation of water are put forward to show the potential economic gains of establishing a water market, despite the fact that it is precisely this aspect that the government has been handling most successfully hitherto. Because of the priority in the centrally managed decision-making process, non-agricultural sectors are considered first and their development is hardly constrained or impeded by the lack of water. Sectoral deadlocks are particularly crucial in the western USA because of the specificity of the prior appropriation rights system. However, this is not the case in Thailand, where establishing rights might create precisely the kind of problems they are supposed to solve, should the rural sector—as occurs in the USA—be reluctant to relinquish its rights.

Such proposals of water pricing and full privatisation also meet the interest of powerful companies, and these policies receive regular support from "analysts," complacently relayed by leading national newspapers[21]. These proposals for economic regulation are greeted with foot-dragging by the line agencies concerned (fearing a modification of their power), are disregarded by most politicians ("what politician will go to his constituents and say 'I am going to vote for water charges?'" questions Cumming-Bruce [1999]), and are vehemently opposed by NGOs and social activists who consider water as a social good and the free use of it as a human right. As expressed by a scholar at Thammasat University, "natural resources—such as water—are essential to all, and should not be managed by market mechanisms. Otherwise, water would not flow by gravity but by purchasing power. Commoditisation of water should not be allowed because the right to natural resources is a basic right all human beings have." This view is echoed by some farmers, who inquire why they should "have to pay for the water that Mother Earth and the forest give us" (*The Nation*, 11 June 2000). The diversity of viewpoints adopted is also well exemplified by the several contradictory projections of the evolution of water use in the upper basin that have been proposed by consultants and academics[22].

10.5.2 "Bringing farmers in": the recurring motto of participation

Another crucial arena of political and ideological confrontation is that of people's participation in water resource management. It can be observed from the earlier description of the allocation process that farmers and other water users are,

formally, almost totally absent from the allocation process. However, their indirect influence through politicians partly compensates for this, although interventions are made without transparency and end up favouring some areas at the expense of others. The top-down nature of the process has always been paralleled by a rhetoric of decentralisation and people empowerment.

Based on the overarching principle that farmers must be involved in allocation, management, and maintenance decisions, the World Bank in the 1980s supported the setting up of Water Users Organisations (WUOs) at the ditch and lateral levels. Despite the resounding failure of this attempt, the idea recently came back to the fore as a component of a plan initiated by the Asian Development Bank (ADB) to reform the water sector. 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 plain 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 adopted 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).

Despite such consensus on the necessity to bring farmers (and other users) into the decision-making process, little success has so far been registered. Most programmes of the past were well-intentioned voluntarist undertakings 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 after being shown where "their interest" lies. This is expressed by Daundaun (1992) who states that "bringing a WUO to its goal is a matter of patience and efforts. 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 the RID and other agencies to help [WUOs] develop" (Metha, 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. Strong emphasis is always laid upon the necessity of involving farmers in the process but farmers' enthusiasm hardly comes as a result.[23]

These attempts are undermined by the inappropriateness of the conceptions underlying state involvement in the countryside. 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" (Metha, 1995). 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). Attempts to institute Participatory Irrigation Management are still perceived locally as state-initiated and state-oriented[24], without real benefit for the farmers in terms of improved access to water[25].

Relationships between state agencies and farmers have long been marked by a degree of paternalism countered by a mixture of passivity and suspicion. The idea that farmers are not educated, stubbornly grow rice with wasteful techniques, and do not cooperate for water management is 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 Nelson, 1998a and Chapter 14). For Atiya (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 Chai-Anan (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).

Organised groups also tend to be a political issue. Politicians usually cultivate local leaders for their ability to relay political influence and to act as canvassers (see Nelson, Chapter 14). Collective organisations, such as WUAs, are attractive entities for politicians to patronise, as they can use their power to elicit preferential water allocations and be politically rewarded at election time[26]. A study of one of the few remaining WUAs in the delta (Ban Rom Cooperative, often presented as a success story and, in any event, a showcase for the RID) clearly showed a three pole interaction between the farmers, the RID Project staff, and a local MP (Molle *et al.,* 2001b). The MP wields influence on the WUA (all the office chairs he

donated bear his name) and RID's officers admit they have to give a "bonus" to the WUA because of its efforts to conform to the organisational blueprint fostered by the agency. The feeling that their bargaining power to get water in the dry season is increased because of the existence of the WUA is shared by most of the members, but the study showed that this advantage was nevertheless limited.

The fact that farmers often turn to local or national politicians to solve their problems (when they cannot be solved by RID field staff) is indicative of the cost and ineffectiveness of formal legal processes (Christensen, 1994) but also of the cultural background which emphasises individual and group access to politicians and bureaucrats (epitomising traditional patron-client relationships and the pervasiveness of dyadic relationships and personal networks; see Shigetomi, Chapter 13). This attitude is germane to Nelson's observations (Chapter 14) on the absence of collective citizen action and regular political discourse organised in political parties, paralleled by networks of personalised relationships organised in *phuak* (cliques).

Hunt's remark (1989) that the interest in WUOs is based on a wrong extrapolation of the more successful experience of community-based irrigation systems is all the more relevant in the Thai context. Communal irrigation in Northern Thailand dates back seven centuries and is widely praised, and sometimes idealised, as an example of local wisdom and social cohesion. Uraivan (1995), for example, states that "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." The extrapolation of the scale, ecological setting, and historical context of such a system to large-scale state-run schemes commonly leads to misconceived analyses.

10.5.3 Transplanting experience

We have mentioned earlier the contradiction between the decentralisation rhetoric and the very nature of the Thai bureaucracy, which prompted Rigg (1991) to state that "a truly decentralised, grass-roots development approach comes into conflict with bureaucratic methods and Thai society." Reforming the highly centralised bureaucratic and top-down process of water management means a sweeping institutional redefinition of the role of the state, the establishment of middle-tier organisations representative of water users, notably farmers, and the integration of decision-making at the level of the river basin. River basin management has now gained worldwide interest and many models are proposed, often based on French,

Australian, American, or other experiences. Shah *et al.* (2000) have warned that "uncritical 'copycat' replication of successful institutional models—either by enthusiastic national governments or at the behest of enthusiastic donors, is the sure formula to failure. The history of institutional reform in developing country water sectors is dotted with failures of such copycat reform."[27] It is obvious that the mere formation of a River Basin Organisation does not ensure integrated management (Schlager and Blomquist, 2000). Such reforms are best seen as far-reaching transformations of social relationships and prevailing rights, and hence will be difficult and time-consuming to achieve (Wegerich, 2001).

An examination of the eight pilot Water Basin Organisations (WBOs) established by the Office of the National Water Resources Committee (ONWRC) or by the ADB shows that farmers are grossly under represented. The WBOs of the upper and lower Ping Rivers, for example, have only two farmer representatives each, compared with 22 and 20 officials respectively. To some extent, WBOs might suffer from the same lack of political and institutional support, and of formalisation, which affect, "upstream" of them, the Office of the National Water Resources Committee (ONWRC) and, "downstream", the Water User Groups. Therefore, the odds are high that in the absence of a sweeping legal redefinition of powers and roles, these pilot WBOs will remain formal institutions with no real power and minimal people's empowerment. What is known about the resilience of the Thai bureaucratic polity and its enduring hierarchical and paternalistic qualities should preclude any optimism on the extent of the decentralisation process, as well as on the propensity of the administration to hand over its power swiftly and willingly.

10.6 Conclusions

For a long time, water resources in Thailand were a natural, uncontrolled, and often destructive element which shaped settlements and life. With the advent in the 1960s and 1970s of large-scale public irrigation schemes and storage dams, this principal factor of production (particularly for dry season cropping) came under the control of the state. The allocation of water follows a typical top-down decision-making process that partly embodies the bargaining power of the different provinces concerned. Because of the the scarcity of water relative to demand, interventions (political or otherwise) that influence the distribution pattern of water amount to significant power: MPs and other constituencies' representatives have long mediated requests for water as a way to act as patrons and gain political rewards in times of election.

However, state power over water has been significantly curtailed at several levels. At the basin level, it has proved very difficult for line agencies to control the effective diversion or abstraction of water in the middle basin (and to resolve the competition with one another), resulting in less supply and growing uncertainty in the delta. In the irrigation areas proper, the RID's management has been dramatically challenged by a boom in farmers' pumping capacity. With the capacity to access any stored or running water, irrespective of whether the level of water allows gravity supply or not, farmers have largely evaded the control of the RID on the allocation of the flow. By so doing, they have lowered the RID's responsibility to control water levels, and have therefore strengthened individual strategies for accessing water. In addition, they have learnt how to play with cropping calendars, starting early or late crops with the contribution of tube wells or rainfall, as a way to force the RID to allocate more water in order to avoid the loss of standing crops. Non-agricultural users, too, have encroached on irrigated areas and tapped irrigation water, or have depleted aquifers (provoking critical land subsidence in the BMA), capitalising on the absence of adequate legislation and on the lax enforcement of existing laws. Attempts to regain control through the establishment of ad hoc Water Users Organisations have failed, as farmers have remained passive in front of organisational blueprints devoid of any provision to increase their control over water and imposed by a state caught up in the empowerment dilemma (*helping farmers to help themselves*). The overall picture is that of a state apparatus weaker than commonly assumed.

While farmers have attuned their strategies to this situation, in particular by finding political support to access more water, they have also learnt how to exploit their political weight and the coverage of the media (which invariably portrays them as the destitute segment of the nation). They do this to obtain increased deliveries even when they are at fault for having planted rice against the instructions of the RID, or when low dam stocks are signalling high risks of shortage. Except in the case of the political vs. technical discussion about the overall seasonal target, most farmers' attempts to improve their lot are done in a totally opportunistic and generally individualistic fashion. As a result, the spatial macro-pattern of water allocation shows sharp discrepancies between canals, and there are few collective arrangements at the secondary level to improve equity. This is partly due to the overly high uncertainty in water supply, which discourages or undermines any attempt to establish rotations or other arrangements.

Locally, farmers display heterogeneous reactions to water stress. The most common reactions, stemming from a culture of conflict avoidance and a propensity to take

inequalities for granted, are to either fully capitalise on an advantageous location (e.g., along a main canal) to achieve double or triple cropping; or to compensate for a disadvantageous area by tapping secondary resources (ponds, drains, wells) while seeking the intermediation of local leaders or politicians; or to simply adopt non-agricultural strategies (pluri-activity, off-farm work, migration). The demise of agriculture since the mid-1980s, due to the dramatic transfer of labour force to non-agricultural sectors, has undoubtedly contributed to easing the tension on water.

While the current top-down allocation processes and *ad hoc* patterns of distribution associated with individual pumping allow very efficient use of irrigation water, they prove ineffective in ensuring more certainty and equity. Average cropping intensity indexes by projects show wide disparities, with an advantage in favour of the western part of the delta. At the same time, water conflicts in the upper basin and a declining supply to the delta calls for a formalisation of water service agreements[28]. Proposals for a reform of the water sector stem from a confrontation of viewpoints in which underlying ideologies or veiled interests strongly shape the nature of the measures envisioned. The rhetoric of people's participation and empowerment appears as a consensual tenet, as no one will admit opposing it, but its meaning differs according to who—NGOs, state officials, academics, or international agencies—embraces it. The ADB-led reform aimed at establishing water pricing and water markets appears insensitive to real world constraints. As Mollinga *et al.* (1999) have shown in an Indian case, the "devolution or decentralisation of resources control to users is a highly complex, social and political issue, which requires special mechanisms to go beyond reinforcing the unequal and undemocratic *status quo*," and therefore can only be envisioned with a long time horizon[29].

In other words, a reform will meddle deeply with the distribution of power in administration as well as in political circles, redefine relations between the state and citizenry, go against deep-seated cultural representations of hierarchy and social roles, and potentially threaten those who tend to benefit from the existing patterns of water allocation. Reforms also require legislation, administrative coordination, accountability, law enforcement, and technical management, which are tantamount to a drastic societal change. The crux of the matter, therefore, is to assess whether the situation is serious enough to merit such critical change. International consultants, economists, and academics who make the case for change may underestimate the difficulties lying ahead and confound the real world with that of theory. It is a matter for further reflection (and wonder alike) that

reforms can be gleefully and technocratically devised with so little reference to cultural, administrative and political considerations, as if problems could be solved by awareness campaigns, capacity building, and bylaws.

The dialectic between growing water scarcity in the delta on the one hand, and increasing inequity and potential conflict on the other, is already in motion and will become more intense. At the same time, a perceptible change in mentalities (Chaiwat, 2000), and the slow but gradual increase in participation of civil society offer some hope that reforms, to follow Vandergeest (1991), will occur as a "right" defined and negotiated by stakeholders rather than as an ambiguous "gift" granted by an entrenched bureaucracy.

10.7 Notes

[1] The symbolic permanence of this is evidenced by the fact that all main storage dams in Thailand have been named after a member of the royal family. The two major dams controlling the supply of two-thirds of the Chao Phraya Basin were named after His Majesty the King (Bhumibol Dam) and Her Majesty the Queen (Sirikit Dam). "On November 21, 1996, the Royal Thai government and the Thai people joined in naming their king 'Father of Water Resources Management'" (Sitthiporn Na Nakhon Phanom, 1999), which was also in recognition of the King's deep interest in issues of water and rural development.

[2] At that time, the average farm area was around 30 rai in the delta (see Molle and Thippawal, Chapter 4).

[3] This chart shows average trends rather than year-to-year data which can include high fluctuations due to varying water stocks in the dams at the beginning of the dry season. It is assumed that dam water release during the wet season will remain unchanged (2.9 Bm^3), while agriculture in the dry season is being attributed the remaining share of the water balance. The net inflow in the two dams is assumed to continue to decline by 1 Bm^3 over the next 25 years (a conservative hypothesis) while the BMA is projected to grow at 5% per year. The gradual diversion of the Mae Klong River to supply the Thonburi area, up to a maximum of 45 cms, is also considered, together with a decrease in underground water use in the BMA by 50% in the next 10 years. For details on the assumptions made, see Molle *et al.* (2001a).

[4] In the 1990s, the tendency has been to offset this decline be reducing carry-over stocks, thus increasing risk and occasioning water shortage in 1994 and 1999.

[5] This hypothesis is also consistent with the projections of the National Economic and Social Development Board for the 9th Plan (2002–2007), with annual growth rates of between 5 and 6%.

[6] Of course there are system wide management constraints. Water allocated to the delta or BMA has to flow through the lower reaches of the Ping and Nan Rivers, where it can be appropriated by other users.

[7] This is inherited from the situation in the 1980s when the West Bank gave up wet-season cropping (with traditional rice varieties) to grow a pre-monsoon crop (before the flood period). This crop was quickly doubled by a post-monsoon crop, which turned the lower delta into a double cropping area.

[8] In 1981, the Cabinet appointed the Dry Season Cropping Promotion Committee, chaired by the Minister of Agriculture, to prepare an annual plan, objectives and promotion measures for dry-season cropping. A sub-committee was appointed to collect relevant data and, each year, to prepare a plan. After acceptation of the plan, users and agencies would know the schedule for dam release and operate accordingly (Binnie and Partners, 1997). During the 1991–94 drought period, it proved impossible to manage the system according to the plan and the committee ended its work. However the sub-committee continues to meet yearly in order to achieve some coordination between agencies.

[9] This translates in particular into a sometimes intriguing overlap of bureaucratic units. As every province is provided with representatives of all the central departments, there is a province-level RID office even in those provinces (such as Ayutthaya, Ang Thong or Sing Buri) with areas *entirely* included in one or several of the RID Irrigation Projects of the delta. Although these offices mediate investment decisions made at the provincial level, such as a gate in a drain, the excavation of a natural pond to provide a reservoir to local populations, the raising of a dike, etc., they are as a rule located within the command area of the projects and therefore amount to a duplication of decision-making processes.

[10] This is an intermediate level between the Central Office in Bangkok and the Irrigation Projects. Thailand is divided into 12 Regions. The middle basin is controlled by Regional Office No. 3 (Phitsanulok), while the delta is managed by Offices No. 7 (left bank) and No. 8 (right bank). The Mae Klong area belongs for its part to Regional Office No. 10 (Kanchanaburi).

[11] Molle *et al.* (2001a) provide graphic evidence of huge discrepancies between the inflow in the main canals and the corresponding planned schedule.

[12] This drives farmers to start their crops in November or December while traditionally dry season cropping was scheduled to start in February.

[13] With only limited areas with flood-prone rice systems, which were initially disregarded for dry season cropping. In addition these areas have now been transformed into double cropping areas, such as the lower tip of the Don Chedi Project.

[14] This situation may however evolve, depending on which parties are part of the ruling coalition and which "control" the Ministry of Agriculture.

[15] A sub-unit of a project (approximately 1,000–1,500 ha)

[16] Despite this policy being obsolete, it is still sometimes formally adopted (but not strictly adhered to).

[17] This is not merely a declared intention from officers seeking approval of their work (or a naive recognition of it). It also mirrors a pervasive paternalistic relationship between officials and villagers, which often borrows traits from traditional patron-client relationships (see Nelson, 1998a).

[18] We focus here on water allocation; maintenance and construction works might deserve another treatment.

[19] As nicely put by Redmond (1998), Thais 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."

[20] None of these actors can be considered as homogeneous in terms of interest or ideology. For example, the Metropolitan Water Authority's website bears a motto which suggests that agencies can have mixed feelings: "Tap water is not a commodity but something obtained from the management of natural resources, therefore it is a treasure whose ownership right must be extended to all people." NGOs, in turn, do promote grass roots participation as a corrective to state intrusion but this may also serve the interest of local elites (Delcore, 1999).

[21] A good example can be found in "Privatising Thailand's water" (*The Nation*, 28 April, 2000), where Christopher Lingle, an "independent (sic) corporate consultant," explains how "opponents of privatisation are guided by outmoded ideology or are pursuing their own self-interest."

[22] Pal and Panya Consultants (2000) estimate that water use in the Ping and Nan basins will increase from 6.7 Bm^3 in 1996 to 9.3 Bm^3 in 2016, resulting in a reduction of the inflow at the Chai Nat Dam by 1.5 Bm^3 over these 20 years. These estimates are based on a projection of domestic and industrial use and on the "irrigation Project development potential." This seems a rather optimistic scenario and most probably overrates the reality to come. JICA (1997), examining the need for trans-basin diversion to the Chao Phraya River Basin, tabulated the expected

water demand in the Nan, Yom, and Ping basins in 2016 as 11.2 Bm^3 against 6.5 Bm^3 in 1993. In sharp contrast to these studies, which agree that the future demand for irrigation water in the Chao Phraya River Basin will increase, Binnie and Partners (1997) posit it will remain constant. This assumption seems to be based on the fact that paddy land is decreased by 1% each year in the delta and on the premonition of a significant shift out of rice to field crops. This fails to understand that the water demand is governed above all by dynamics in the dry season, when multiple cropping is possible if the conditions are attractive. If there is enough water, dry-season cropping will offset by far the decrease in paddy land. In a similar fashion, TDRI (2001), using economic modelling principally based on the World Bank's projection of world rice prices, considers that water demand might first rise but later decline in the medium term. The complexity of agricultural dynamics at the national level, with its linkage to the global economy, together with the high uncertainty regarding rice prices, tend to make such a projection exercise rather perilous. In any event, a decrease in water use would constitute an interesting precedent, with probably few examples in the world.

[23] "Farmers should be involved to an appropriate extent in every phase of project development" (Daundaun, 1992); "Farmers should be treated as key participants, not just as a supplementary element of the system" (JICA, 1994); "Farmers participation is key to project success. The Water User Group is a fundamental institution to facilitate farmers participation" (Metha, 1995); etc.

[24] 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 establishment of WUOs. Interestingly we have, albeit occasionally, seen this word used both by RID officers and by farmers.

[25] The successive efforts to establish and strengthen WUOs have not only been unsuccessful and wasteful in terms of budget and energy, but they have also contributed to the spread of mistrust and a lack of interest regarding state-initiated groups. This is reinforced by the frenzy of the Thai government to pile up state-supported groups aimed at various activities—rice banks, buffalo banks, fishing groups, cooperatives, peer groups for credit (*klum sacha*), cooperative shops, cottage industry groups—even though most groups appear to be apathetic.

[26] Politicians try to appear as benevolent patrons bringing benefit to the community (roads, water supply, donation to the temple, etc), in other words as patrons. The most striking observation reported by Arghiros (1992) concerning a case study in Ayutthaya is that an estimated 90% of villagers did vote for the candidate who had either bought their vote or "earmarked it" by entering into a patronage relationship

with the village. This "internalised compulsion to respect the transaction," although sometimes reinforced by intimidation, provides a fascinating example of the pervasive effectiveness of reciprocity in patron-client relationships.

[27] India, for example, tried to transpose the TVA (Tennessee Valley Authority) model by constituting the Damodar Valley Authority, but this led to a resounding failure. A similar early enthusiastic copycat drive in Thailand appears in Trivat (1962), who thinks that "it seems timely to take TVA's experience to another area for water resource development particularly the Chao Phya river. . . . A new and modern task requires new and modern tools; a spirit of enterprise and a creative outlook are required in this new organisation for getting things done similar to TVA."

[28] I intentionally do not use the word "water rights" here. Rather than property rights, which appear totally unrealistic (see Molle, 2001a), *participatory mechanisms* of negotiation should be established at the basin level for defining macro-allocation and monitor effective use.

[29] See the following statements: (i) "A water tax could be levied, in a manner similar to the paddy land tax, over the whole area at present cultivated and the future extension of this area, as far as the fields are benefited by the [irrigation] system. . . . water rates could in general be assessed in some proportion to the quantity of water utilised, and would most probably be a suitable taxation for dry season crops and garden cultivation." (ii) "The light taxation affects any large scale government programme to improve conditions for the peasants. It is evident that not until the government has assurance of steady and increased income from local taxes can it expect to support large scale farm improvement projects. . . . As yet the government has not come to the conclusion that at least a partial support of such a project should come from equitable taxation of the peasants. Any program designed to aid the farmer, such as large scale irrigation, is recognised now only as a national investment and a responsibility of the government. That this policy sooner or later must change is self-evident, for without local taxation the peasants' demands for agricultural, educational, health, and transportation improvements can not be met." The interesting point about these two statements is that they are not issued from a recent consultant report, as one would believe, but from Van der Heide's report and De Young's "Village Life in Modern Thailand," dating back to 1903 and 1955 respectively.

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Thailand's Rice Bowl

Perspectives on Agricultural and Social Change in the Chao Phraya Delta

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editors

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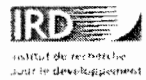

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