5 Thailand's 'Free Water': Rationale for a Water Charge and Policy Shifts*

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Introduction

Despite the success claimed for the irrigation sector in contributing to falling food prices, food security and raising farm income, irrigation has, in the last two decades, elicited growing frustration in the community of aid agencies and development banks. A major reason for such sentiment is the low financial sustainability of the sector, which incurs recurrent rehabilitation expenditure and subsidies to operation and maintenance (O&M) that add to the large initial investment costs. A second reason is that agriculture accounts for 70% of the use of water and, despite growing shortages, is seen to be bedevilled by very low levels of efficiency (the water effectively used is only a small fraction of the water diverted) that seem unacceptable in a time of growing needs in other sectors. In addition, farmers often apply large quantities of water to irrigate crops that have both high water requirements and a low return (typically, rice in Asia).

These problems of perceived low efficiency, poor management and financial unsustainability have been addressed by a wide range of actions that include rehabilitation, modernization, improved technical management, participatory management, turnover and collection of water charges. The limited benefits obtained have spurred many proposals to tackle these problems with some economic tools and incentives, particularly in the aftermath of the Hague and Dublin meetings (Rogers *et al.*, 1997).

In Thailand, water is supplied to agriculture free of charge: water is best seen as a gift, traditionally linked to the good will or power of the absolute king, who mediates its supply from supernatural forces. *Chonlaprathan*, the Thai word for irrigation, embodies a notion of the royal gift. The *Loy Krathong* festival, in November, when offerings are put afloat on the waterways of the kingdom to thank the water spirits for the life that water brings, epitomizes the relationship between people and water. However, proposals for water pricing in the country can be found as early as 1903, in the *General Report on Irrigation and Drainage in the Lower Menam (Chao Phraya) Valley*, submitted to the Government of Siam by Van der Heide (1903), a Dutch engineer in charge of the Department of Canals:

> 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 utilized, and would most probably be a suitable taxation for dry season crops and garden cultivation.

  Irrigation Water Pricing (eds F. Molle and J. Berkoff)

The logic for pricing water may have, at that time, been borrowed from practices in Java, India or other Asian countries under colonial rule. Likewise, in the post-World War II period when the International Bank for Reconstruction and Development funded the development of infrastructures in the Chao Phraya delta, the consultant in charge of the study saw no difference between irrigation supply and railways or electricity and stated that it would 'not be a misuse of language or an exaggeration to describe the position [of Thailand] as extraordinary. . . . The Irrigation Department is thus unique among the commercial departments of the Government in Thailand in deriving no revenue from its services and unique or nearly so in this respect, throughout the world' (IBRD, 1950).[1] Although, at the time, the Thai government had shown willingness to establish fees once the scheme would be completed and proper supply ensured to users (IBRD, 1950), the idea seems to have then vanished and only recently come to the fore. In the aftermath of the 1997 financial crisis, reform of the agriculture and water sectors was encouraged by both the World Bank and the Asian Development Bank (ADB), and the latter supported the definition of an ambitious plan aimed at introducing river basin management, service agreements between the Royal Irrigation Department (RID) and users, cost recovery dubbed as 'cost-sharing', and legal dispositions around a Water Law. This policy remained a dead letter for a set of reasons that cannot be easily untangled, but which includes resistance from line agencies, weak political support and the over-optimistic and often unrealistic nature of many of the proposals. Despite the setting of a policy matrix that defined commitment to successive milestones to be achieved, the process lost momentum before being eventually discontinued by the Thaksin administration.

In this chapter, I first examine the relevance of the arguments for establishing water charges in the particular context of Thailand, and most particularly that of the Chao Phraya delta, the rice bowl of the country (Molle and Srijantr, 2003). In the first section, I address successively the role of pricing as: (i) a means to signal to users the economic value of water and hence regulate its use and avoid wastage; (ii) an instrument to reallocate water to crops with higher water productivity or to non-agriculture sectors; and (iii) a cost recovery mechanism. In the second section, I briefly examine reforms that failed in the past, and attempt to draw conclusions on both the potential charging for water and the way a policy reform process should unfold. Although unsuccessful, these attempts at reforming the water sector provide useful lessons on the constraints commonly faced by water pricing policies, particularly when they fail to fully appreciate the context in which they are to operate.

Before turning to these points, it is useful to single out a few specific features of the Chao Phraya delta, on which the analysis will focus. Agriculture in the delta traditionally distinguishes between the wet season (where rain is abundant, sometimes in excess, and irrigation merely a complement) and the dry season (when irrigation is a prerequisite to agriculture). The hydrology of the delta is very complex, since it includes numerous side flows and return flows, canals serving for both supply and drainage, generalized use of pumps, predominance of paddy with common plot-to-plot systems of supply, vulnerability to flooding, use of waterways for navigation, domestic supply, dilution of pollution load, etc. This defines a context with numerous uses and users where it is difficult to clearly identify both the sources of supply and the uses, and which is therefore little amenable to quantitative regulative mechanisms. Many of these features apply to other Asian deltas, particularly those of the Cauvery, Ganges–Brahmaputra,

[1] The consultant also underlined the value of charging for water in order to limit wastage and to control society's demand for unsound projects: 'Mankind values the things it has to pay for and thinks little of and uses wastefully the things it gets free. Moreover if water is supplied free, farmers who get no water will be unable to see why their neighbours should and the Government will be embarrassed by pressure to carry out schemes regardless of whether they are sound or not.'

Irrawaddi and Mekong rivers. On the other hand, the delta includes Bangkok and enjoys good transportation networks and rather efficient linkages to urban and export markets.

Water Pricing and Its Potential Roles in Thai Irrigated Agriculture

Dealing with unacceptable water wastage?

The statement that water is wasted when it is free or underpriced probably appears in one form or another in all papers and reports that address the issue of water pricing (see Molle and Berkoff, Chapter 2, this volume). This simple axiom has been disseminated widely by analysts like Sandra Postel (1992), who observes that 'water is consistently undervalued, and as a result is chronically overused', by development banks and agencies (e.g. World Bank, 1993; ADB, 2000), as well as by many academics. In Thailand, an endless number of observers[2] have taken it for granted, notably TDRI (1990) and Christensen and Boon-Long (1994), who posit that 'since water is not appropriately priced, it is used inefficiently, and consumers have no incentive to economize'. Several reasons, related to both theoretical assumptions and constraints to implementation, showing that such statement may be misleading are reviewed here.

That rising water fees may be conducive to water saving is shown by numerous experiences in the domestic and industrial water sectors (Gibbons, 1986; Dinar and Subramanian, 1997; Dinar, 2000). Since individual meters can be easily installed on pressurized pipe networks, volumetric charging is practical and users' behaviour is generally affected by rising charges although, beyond a certain point, the elasticity of water demand falls drastically. The facts that *volumetric* charging is a prerequisite and that it is not feasible in the short run in most large-scale irrigation schemes of Asia are well recognized in the literature. Yet, in Thailand, where most of the hydraulic structures are rather crude, this evidence is generally glossed over and the potential benefits of volumetric charging are often assumed implicitly for pricing *in general*, as illustrated by the various statements collected in footnote 3.

Since volumetric pricing at the individual farm level is unrealistic, 'water wholesaling' in which water is attributed to groups of users, for example, to the farmers who are served by the same lateral canal, appears to be an attractive option. This alternative has the advantage of encouraging farmers to act collectively to achieve reduced demand within the command area of their canal, and shifts on them the burden of solving conflicts and collecting a water charge. However, the effectiveness of such an arrangement rests on the possibility of: (i) defining and registering who the beneficiaries are; (ii) designing a transparent allocation mechanism at basin, project and farm levels; (iii) ensuring water supply to groups in accordance with an agreed service; and (iv) having Water User Groups that are in a position to perform all the tasks entrusted to them. Therefore, the wholesaling of water appears more like an option that would be made possible by a series of critical reforms spanning technical, legal, managerial and political domains, than a measure that can be put forward in a 'non-mature' context. In the case of Thailand, few, if any, of these prerequisites are met.

The policy framework supported by the ADB in the 1999–2001 period (see later section) laid some foundations for establishing 'cost-sharing' and defining 'service agreements' between the RID and users that could amount to a kind of bulk allocation. Attractive in its design, the policy probably much

[2]How popular wisdom emerges can be sensed from the following declarations. An official of the Ministry of Agriculture said: 'Water should be priced in order to increase the efficiency of its use in the farm sector' (*The Nation*, 2000, 21 April); 'Agricultural experts agree that water-pricing measures would help improve efficiency in water use among farmers' (*The Nation*, 1999, 17 February); the Director of the National Water Resources Committee observed: 'In reality water is scarce, and the only mechanism to save water and encourage efficient use is to give it a price' (*The Nation*, 2000, 23 April); etc.

underestimated[3] both the technical difficulties to define and ensure service agreements and the institutional/political transformations required (Molle *et al.*, 2001). Even where bulk allocation was implemented as part of a programme of management transfer (as in Mexico and Turkey), was credited with some success and contributed to a better fee collection and financial situation, there is little evidence that significant water saving in land or water productivity or gains have resulted from these reforms (Murray-Rust and Svendsen, 2001; Samad, 2001).

Even if some kind of volumetric pricing were possible, prices would have to be set at a level high enough to have a bearing on farmers' behaviour. There is, indeed, overwhelming evidence from the literature that tariffs which reflect O&M costs and are economically feasible are in too low a range to have any significant impact on behaviour (Gibbons, 1986; de Fraiture and Perry, Chapter 3, this volume; Ray, Chapter 4, this volume). An average water fee of B(baht)120/rai (one rai = 0.16 ha) as proposed by the ADB policy (H&P and A&E, 2001) would amount to 5–7% of the farmer's net income per rai. While not negligible, such a value would be unlikely to affect behaviour at the margin, assuming – for the sake of demonstration – *volumetric* and individual pricing, saving, say, 30% of water would increase the revenue per rai by only 2%, a value much under the opportunity cost of the additional labour necessary to achieve such water savings at the plot level. It can therefore be safely concluded that the proposed fee, based on area and set at half the estimated O&M costs, would have no impact on water use whatsoever, despite repeated claims to the contrary.

The second issue considered here is whether water is indeed wasted, and whether significant savings could be achieved, through pricing or other means. Recently, the Director-General of the Royal Irrigation Department on a Thai national television channel declared somewhat contritely that water efficiency was very low in Thailand and that this had to be remedied in the face of the water shortages experienced by the country. International agencies (and sometimes, in their footsteps, local officials) commonly report that Thai farmers are *guzzling* water or are showing *water greed* (*The Nation*, n.d.), furthering the general idea that efficiency in large state-run irrigated schemes is often as low as 30% (TDRI, 1990), and sticking to this overall vision without questioning it any further. Yet, research conducted in recent years has shown that water basins tend to 'close' when demand builds up: most of the regulated water in the basin is depleted and little water is eventually 'lost' out of the system *when it has value* (downstream requirements and environmental services taken into account). There has been widespread recognition that focusing on relatively low irrigation efficiency at the on-farm or secondary levels could be totally misleading (Keller *et al.*, 1996; Perry, 1999; Molle, 2004). When analysed at the basin level, closing systems are eventually found to *operate with a high overall efficiency* during the dry season.

In-depth investigations in the Chao Phraya river basin (Molle *et al.*, 2001; Molle, 2004), most particularly in the delta, have shown that users and managers have not been passive when confronted with water scarcity but, on the contrary, have responded to it in many ways. Farmers have developed conjunctive use, dug farm ponds, drilled wells, closed small drains and invested in an impressive pumping capacity to access these sources. Dam managers have come under pressure to avoid dam releases that are in excess of downstream requirements and have improved management. Reuse of water along the basin and within the delta has developed to the point that, in the dry season, only an estimated 12% of the water released by the dams is lost to non-beneficial evaporation or outflow – effectively recycling the 'losses' from excessive water diversions

[3]One of the consultants involved considered that the policy was not optimistic but 'simply stated what, ideally, *ought to be done*, without claiming that it *would* be done'. This, however, implies that proposals are made on a prescriptive and idealized mode without taking into consideration the institutional and political context in which they are supposed to be inserted.

in exactly the way that research elsewhere has found and predicted. Because of the tendency to focus on state-designed policies, all the endogenous adjustments to water scarcity that accompany the closure of a river basin are generally overlooked (Molle, 2004).

Irrespective of whether they pay for water or not, farmers are aware that water is valuable and scarce because they are directly confronted with the consequences of its scarcity, and have made significant investments in pumps, wells and ponds to tackle it. To squander water, farmers should first be in a position to access *more* water than they need, which is contradictory to the situation in the dry season, where cropping intensity is around 60% and where water shortages push farmers to actively look for alternative sources of water.

In the wet season, patterns of water use often differ. In many instances water management is geared towards getting rid or controlling the potential damage, of excess water, rather than saving water. Water use at the farm level may be wasteful, but this only reflects the fact that supply is continuous and abundant (with a zero opportunity cost) and that the water 'wasted' was destined to flow back to the river anyway. Indeed, abundant water can ease management both to farmers and operators so that 'wasting' water may be the economic optimum given its zero opportunity cost.

Finally, stating that water is 'free' misses the point that the majority of farmers have to resort to pumping to access water in the dry season (when saving water is an issue), to offset both the lack of water and the uncertainty in delivery. Because of the costs incurred by these water-lifting operations, there is little likelihood that farmers (80% of farmers in the lower Chao Phraya basin have at least one pump set) will squander water (Bos and Wolters, 1990).

Shortages and crises are not due to a hypothetical low efficiency but to the insufficient control over interannual regulation, water allocation and distribution. The lack of strong technical criteria in managing dams and in allocating water to irrigation, the uncontrolled planting[4] by farmers and the irresistible political pressures to which competition for water gives rise, lead to escalating risk and sporadic shortages. This does not dismiss the fact that efficiency gains are desirable but draws our attention to the inconsistency of the commonly stated relationship between farmers' efficiency and water shortage.

Overall, it emerges that both the empirical and theoretical justifications advanced to support the use of water pricing as a regulatory tool for saving water do not hold in the present case. On the one hand, water is not squandered as commonly assumed (adjustments to de facto scarcity occur), the overall efficiency of water use is high (reuse of return flows), and most farmers incur costs to access water that is, therefore, neither free nor wasted. On the other hand, theoretically, savings could be expected if pricing was volumetric and high enough to affect farmers' behaviour, but this has not been verified.

Pricing as a reallocation tool

Improving irrigation efficiency is only one aspect of better using scarce water resources. Another potential benefit from water pricing could be to encourage a shift towards crops that are less water-intensive, and/or that display a better water productivity ($/m^3), or towards non-agricultural uses. Volumetric pricing would directly penalize crops with high consumption of water, but it could also be possible to establish water charge differentials based on crop type, that would

[4]The hopelessness of officials is apparent in public declarations: The Deputy Agriculture Minister reported in early 1998 that 'plantations in Nakhon Sawan, Tak and Kamphaeng Phet had increased to more than 670,000 rai from a target of 190,000' (*Bangkok Post*, 1999, 13 January), while the RID Director admitted that 'things are out of control', with 330,000 rai under cultivation, against a limit set at 90,000 rai (*The Nation*, 1999, 8 January). 'Our major concern is that we have no effective measures to control the use of water by rice growers. The only thing we can do is ask for their cooperation to cut down rice cultivation.'

encourage farmers to grow crops with lower water requirements. This runs into the same difficulties exposed in the preceding section regarding the elasticity of water use, the impact on farm income, and the constraints to metering volumes (crop-type-based fees escape this last constraint but face costs in monitoring effective land use). This rationale on crop selection often implicitly assumes that farmers do not diversify into field crops, vegetable or fruit crops *because* water is cheap or free, leading them to favour water-intensive crops (e.g. rice or sugarcane). This assumption also needs to be put in context.

In Thailand, the possibility of achieving water conservation by inducing a shift away from rice to field crops, which consume (ET) only 50–80% of the amount of water needed for rice, has long been underlined by policy makers and has formed the cornerstone of state projects aimed at fostering agricultural diversification (Siriluck and Kammeier, 2003). This was already a recommendation of the FAO as early as the 1960s, as well as the alternative that 'received the most attention' from Small (1972), in his study of the delta. Such a concern has been constantly expressed for at least four decades. Even nowadays, it is not rare to hear officials complaining off record, that 'farmers are stubborn', that 'they lack knowledge and only know how to grow rice' and that 'they oppose any change', despite being shown the benefits they might expect from it. Crop selection, however, is a more complex issue than merely choosing the crop with higher return to land or water.

First, the rationale for induced shifts in land use is generally – implicitly or explicitly – based on average farmers' income, overlooking the aspect of risk, which is crucial in shaping farmers' decision making. Even for irrigated agriculture, where yields are deemed to be more secured, risks in production are not negligible and include both agronomic hazards (diseases, pests, etc.) and a higher risk in marketing, further compounded by the higher requirements of cash input demanded by commercial crops. As a general rule, the potential return of capital investments is strongly correlated to the level of risk attached to the activity undertaken (Molle *et al.*, 2002). This is clearly exemplified by Szuster *et al.* (2003) in their comparative study of rice and shrimp farming in the delta. In other words, while cash crops may generate higher average returns, they are also subject to more uncertainty, either in terms of yields or farm-gate prices. Thus, only those farmers with enough capital reserve to weather the losses experienced in some years can afford to benefit from the average higher returns; others become indebted or go bankrupt. Shrimp farming in the delta, again, provides a good example of such a situation.

It could be argued, however, that the price of rice in Thailand is also unpredictable and that rice production suffers from uncertainty as much as other crops do. If the rice price does fluctuate, its crucial importance for the rural economy brings it under more scrutiny. Despite recurring complaints, echoed in newspapers, that rice farmers lose money when producing rice, the political ramifications of possible low prices and the outcry they instantaneously generate, largely shield them in reality from dropping under the break-even threshold.[5] Ad hoc public interventions are always implemented when such a risk arises (even though their impact generally falls short of expectations, and benefits tend to be captured by millers and other actors in the rice industry). This does not hold, however, for secondary or marginal crops (that invariably include the desirable 'cash crops'), and complaints of scattered producers have little chance of being heard in case of depressed prices. A typical example of such a cash crop is chilli, a rather capital- and labour-intensive crop, which can fetch B25/kg in one year (providing a high return) and B2 or B3/kg in the following year (with a net loss for farmers).[6]

[5]In addition, rice can also be readily stored and used for own consumption, or provided to relatives and friends.

[6]This situation differs significantly from that of western agriculture, where floor prices or 'intervention schemes' are generally established to compensate for economic losses when these occur. In addition, western farmers generally benefit from insurance (against exceptional yield losses) that comes with stronger cooperative and professional structures.

Second, several other constraints to diversification related to production factors are faced by farmers: labour may be lacking; for example, the harvest of mung bean, a typical supplementary crop with no additional water requirements, is often a problem because of labour shortage; capital is often required to transform the land (e.g. conversion to shrimp farms or orchards) or to invest in microirrigation; specific skills are necessary and not easily acquired by an ageing farming population; markets may be limited or the farmers not linked to them. Third, the delta agroecology, including heavy soils with little drainage and flood risk, is overall not favourable to growing field crops especially if neighbours are all growing rice. Fourth, the overextension of irrigation facilities, fostered by considerations of regional equity and by political patronage, makes it impossible to confine them to high-return agriculture only.

The last point is noteworthy. Farmers are expected to behave as rational profit-maximizers and they are not directly concerned with water productivity ($/m^3) but, rather, by the net income per unit of land ($/ha) as well as by the risk attached to a given crop or activity (Wichelns, 1999). There are several alternative crops to rice. A first group – vegetables, fruits and flowers – fares better in terms of income, water productivity and absolute water consumption. A second group – field crops, such as groundnut, mung bean and maize – uses less water, and may have better water productivity, but is generally less profitable and/or riskier with regard to selling prices. A third group – fruits in raised beds, aquaculture – includes crops with better income and water productivity but higher consumption of water. Considering these various options it is clear that water productivity may or may not be increased by a profit-maximizing cropping pattern.[7]

Siriluck and Kammeier's (2003) study of a large-scale public programme aimed at encouraging crop diversification in Thailand showed that such interventions are met with mixed success and are not flexible enough to adapt to different physical and socio-economic environments. In many instances, the attempt by extension workers to meet the 'targets' ascribed by the project has led to inadequate investments and choices, sometimes resulting in debts or bankruptcy. It is doubtful that 'pushing' for more diversification is eventually beneficial. Decisions should be made by farmers, based on their own appreciation of their environment and left to market mechanisms, in order to avoid exposing non-entrepreneurial farmers to bankruptcy. Evidence of the dynamics of diversification in the delta (Kasetsart University and IRD, 1996; Cheyroux, 2003; Molle and Srijantr, 2003) points to the fact that farmers display great responsiveness to market changes and opportunities (a point definitely confirmed by the recent spectacular development of inland shrimp farming: Szuster *et al.*, 2003). Good transportation and communication networks allow marketing channels to perform rather efficiently. Farmers will shift to other productions if uncertainty on water and sale prices is lowered. Time and again, Thai farmers have shown dramatic responsiveness to constraints on other production factors, such as land and labour for example (Molle and Srijantr, 1999), and have already sufficiently experienced the scarcity of water to adapt their cropping patterns, should conditions be favourable. Inducing crop shifts by raising differential fees to the level where they might be effective would substantially impact on farm income and critically raise economic risk, which is precisely the main factor that hinders diversification. While some potential may remain unrealized it is very unlikely that water would be a main constraint, or that pricing it would result in any significant shift.

The reallocation of water towards more beneficial uses can also occur across sectors. The issue is somewhat simpler, as few object to the fact that domestic and industrial uses are to receive priority over irrigation. Here

[7]An example of this contradiction can be found in Iran, or in Egypt, where rice appears as a productive and profitable crop, while being water-intensive, presenting a 'headache issue' (El-Kady *et al.*, 2002) to managers.

again, differential prices could theoretically help reallocate water, although water markets[8] are generally seen as being more efficient in theory. While the literature seems to underscore that there are significant potential economic gains to be expected from such transfers, it is apparent that in Thailand, this reallocation *does* occur and that non-agricultural activities are very little constrained, if at all, by lack of water. While the impact of the transfer of water out of agriculture is an important question (Howe *et al.*, 1990; Rosegrant and Ringler, 1998), leaving open the question of compensation, reallocation is taken care of by the state in several ways, as shown by the case of Bangkok Metropolitan Area (BMA): the growth of BMA generated a rise in demand from 0.46 million m^3/day in 1978 to approximately 7.5 million m^3/day in 2000, a 16-fold increase in 22 years (Molle *et al.*, 2001). This has been made possible not only by increasing the share of the Chao Phraya flow allocated to the city (up to 45–50 m^3/s) but also by using groundwater, with an average extraction around 3 Million m^3/day (TDRI, 1990). Future demand will be met by a recently completed canal which transfers water from the adjacent 'water-rich' Mae Klong basin (with a planned capacity of 45 m^3/s to be reached in 2017).

This shows, first, that the priority given to Bangkok has readily translated into an increased diversion of surface water (to the detriment of irrigation to the extent that it reduces the amount available in the dry season), and, second, that the impact of the shift has been mitigated by allowing industries to mine deep aquifers (at the cost of land subsidence and sustainability). Water from the Mae Klong basin will allow Bangkok to face future growth in demand, although possibly at a higher capital cost in economic terms than might have been possible if more water had been diverted out of agriculture in the delta area. This illustrates that Bangkok's needs are attended to in priority and that – despite its larger share in total water use – agriculture largely gets the leftover water in the system. Commentators, however, keep on asserting that the state has proved inefficient in centrally allocating water to the most beneficial use.[9] It is interesting to note the ubiquity of this argument even in settings where this problem has been handled relatively successfully.

Pricing and Cost Recovery

Justifications for cost recovery are diverse. One argument is that irrigators form a segment of society that has benefited from a specific capital investment by the state and, as such, are expected to channel back to the nation a part of the profit generated. If this logic of 'reimbursement' is often justified by notions of equity (redistribute part of the profits of those benefited), ideology (state involvement should be limited) or financial clarity (activities must be turned autonomous), shifts in public policy are generally motivated by more mundane reasons of 'financial drought'. We will examine here the rationale for cost recovery, as applied to the case of Thailand.

[8]A market is unrealistic in the present situation given the lack of control over volumes and of connectivity between users. The assertion that 'if the price of rice is low, [Thai] farmers would be happy to cede their right to industrialists' (Wongbandit, 1997) not only runs counter to the evidence that industrialists or cities are anyway served first, but also that physical constraints make such a reallocation impossible. How would the 'rights' of a group of farmers in, say, Kamphaeng Phet (middle basin) be transferred to a given golf course or factory in the suburbs of Bangkok?

[9]A typical example is provided by Christensen and Boon-Long (1994): '[A] concern which could raise problems in the area of basin management involves the authority of the basin authorities to impose allocation priorities. . . . The burden of proof for such an initiative is to show that command and control could result in better allocations and less market failure.' Israngkura (2000), for his part, considers that 'the returns on the irrigation dam investment have been low due to the lack of effective water demand management that could prevent less productive water utilisation'. This suggests that the assumed low return of irrigation has deprived other potentially more productive use, whereas irrigation is, in fact, largely allocated the leftover in the system.

Equity, redistribution and the overall arithmetic of rice production

A first line of debate is about whether, indeed, irrigated agriculture can be said to have benefited from a preferential treatment within the national economy and, thus, whether – out of a concern for equity – water pricing as an additional government tax is justifiable as means to: (i) return part of its value-added to government coffers; or (ii) allow, in particular, further investments in the non-irrigated agriculture sector (FAO, 1986).

It is necessary, therefore, to examine whether irrigated agriculture, and in particular rice cultivation, is – overall – subsidized or taxed. Thailand has long chosen to tax its agricultural exports (Schiff and Valdés, 1992) and to recover her investments in irrigation through indirect mechanisms (Small *et al.*, 1989). The revenues siphoned by the state off rice cultivation through the mechanism of the rice premium, between 1952 and 1986, have been estimated at 25% of all rural income (Ingram, 1971; Phongpaichit and Baker, 1997) and it is clear that rice farmers have indirectly paid back more than any realistic water fee. It was estimated that in 1980 these indirect revenues amounted to three times the O&M costs (Small *et al.*, 1989) while capital cost recovery reached uncommon levels. Indirect taxation may be inequitable but is quite efficient since it avoids the costs of collection and the possible corruption that may come with it (Hirschman, 1967). Because declining food prices in the last two decades (driven, in large measure, by the increase in reliable production from irrigation investments) have depleted the surplus that could be extracted from agriculture, these indirect revenues have now dwindled down, being captured as consumer surplus.

This questions the rationale used by consultants to support cost recovery: 'Thai taxpayers are paying B35 billion a year to run RID. If this is worthwhile to the farmers then why should the taxpayers have to pay for RID?' (H&P and A&E, 2000). This question stems from a narrow definition of what 'taxpayers' pay for and ignores the more global arithmetic of sectoral taxes, subsidies and cross-subsidies, not to mention the distribution of benefits to consumers and multiplier effects in the economy. Indeed, rice farmers have probably contributed more to the rest of society than they have received from it, both through taxation and impact on rice market prices.

One might argue, however, that this holds for the past but that the situation has changed. Leaving aside the argument that the water subsidy could be seen as a (small) compensation for the past pattern of indirect, yet heavy taxation, a water fee could be now construed as a charge reflecting the costs of providing irrigation water. This argument differs, depending on whether one considers that: (i) the disappearing of the premium reflects an increasing rice supply in the international market and a decline in real price (squeezing farmers' income and rendering the extraction of surplus unsustainable); or (ii) it stemmed from the growing political clout of a rent-seeking rice sector. Since the evidence unambiguously points to the first interpretation (Isvilanonda, 2001), this can be taken as an indication that rice incomes are now squeezed and that further taxation would have substantial socio-economic and political implications.

Another major argument regarding equity is that of discrimination against rain-fed agriculture, resulting from both the subsidies in capital costs and the supply of free water, since the irrigated sector can produce more per unit of land than rain-fed agriculture and better absorb the impact of declining rice prices driven by overproduction (and, initially, by taxation). Such concern for equity is often mentioned by officials and ADB consultants ('60% of the budget of the Ministry of Agriculture went to 20% of farmers' provided with irrigation). This militates for closing the gap between the two subsectors, for example, by having irrigators bearing the cost of water delivery. This argument is valid when applied to the initial phase of irrigation development, when rain-fed farmers disproportionately bore the costs of the rice premium and low prices, although this was smoothened by the fact that rain-fed production was mostly for home consumption and little for the market. In addition,

initial differences have now been evened out by the evolution of farming systems: in the mid-term, average farm size and the degree of farm fragmentation at inheritance appear to be in line with the average income derived from a unit of land. Molle *et al.* (2002) have studied three sub-areas of the Chao Phraya delta where cropping intensities and return to land per year markedly differ. The study showed that differences in annual land productivity were largely compensated over time (albeit not fully) by growing differences in farm size, family size (linked to the rate of migration) and pluri-activity which partly rebalance final farm incomes.

Rice as a global commodity

Another relevant issue is the international dimension of subsidies, as many of these commodities, notably rice, are traded in international markets. The insistence on having farmers pay the 'real' cost of water can first be questioned when European and American agriculture is admittedly heavily subsidized (Sarker *et al.*, 1993; Baffes and Meerman, 1997; CRS, 2002). This applies especially for crops that compete in international markets – here the price is substantially set by the lowest (net)-cost producers – and it is not clear why developing countries should adopt policies which are not part of the agenda of their western or East Asian competitors. The US Congress, for example, provided $24 billion between October 1998 and 2001 to shield growers against low prices and crop disasters (The Nation, 2001). In May 2002, another 10-year $190 billion farm bill was signed by President Bush. This concerns, in particular, rice production whose revenue includes a share of 50% of subsidies (USDA, 2001, web site). Complying with orthodoxy (full operational cost recovery and 'real' factor prices), on the one hand, and disregarding it entirely, on the other, through intervention when benefits get squeezed by declining prices, illustrate that a real-cost regulated market is not yet in place for reasons that are far broader than water pricing.

An additional difficulty for Thai rice farmers comes from their wide linkage with international markets. Whereas in many markets a change in input prices is readily passed on to the consumers, albeit partly depending on the structure of the market, this does not easily occur for commodities where producers mostly operate as 'price takers', for example, because of links to international markets. In the case of rice, the Thai farm-price elasticity relative to the world-market price is 0.8 (Sombat Saehae, by e-mail, January 2000, personal communication). It follows that farm-gate prices are predominantly driven by the world market and that internal balancing mechanisms to reflect changes in factor prices are critically constrained, to the detriment of producers.

O&M expenditures, financial drought and payment for service

The need for 'cost-sharing', however, may become more pressing when the government is faced with financial squeeze and seeks to reduce expenditure, while the deterioration of irrigation facilities impinges on productivity and farm income, and gives way to costly recurrent rehabilitation programmes. Such deterioration appears relatively limited in the present case (RID's maintenance, especially in the Central Region, can be considered quite good if compared with many other countries), and there is no evidence that financial squeezes, even after the 1997 economic crisis, have drastically altered RID budgets or its capacity to carry out maintenance work. In Thailand, O&M costs are said to correspond to a 'huge drain on the national budget' (H&P and A&E, 2001) but these costs must be put in context[10]: the potential gains from the cost-sharing policies proposed represent 0.37% of the value of Thai agricultural exports, 0.27% of Thai government expenditures or 15% of the

[10]The proposal by ADB's consultants was to set up a tentative fee of B120/rai in pilot projects. This value was intended as a compromise derived from the total estimated O&M costs: B522/rai, out of which B210 were true direct costs (H&P and A&E, 2000).

RID budget itself. Savings of 0.27%, not considering the transaction costs corresponding to the collection of fees, may be not negligible but certainly not considerable when compared with the political risk attached to it. Thus, it seems that the financial squeeze that was one of the major drivers of the Philippine NIA and of the Mexican reforms is not (yet) a crucial incentive to change in the Thai case.

An important distinction must be made between cost recovery that goes to the government coffers, and irrigation financing, that is the provision of funds actually used for irrigation costs (Small, 1996). Surprisingly, the Royal Irrigation Act of 1942 recognized this fact early. It made it legally possible to charge users for water (despite fixing unrealistically low limits), but stipulated that collected money could not be considered as state revenue and should constitute a special fund to be put back into the development of irrigation. If this is the case, and if users are granted partial or total control of the allocation of these funds, then incentives to pay and limit degradation are created and a sense of 'property' may emerge. More generally, it is the potential role of pricing at the interface between line agencies and users, which deserves emphasis (see next section).

Raising fees that only contribute to the government income is a measure that is not conducive to internal improvement and is, therefore, a decision pertaining to the design of the tax system as a whole: making users bear a part of O&M costs is helpful in internalizing costs from the point of view of the government, but shifting this financial burden has to be reasoned, based on wider public objectives of poverty alleviation and wealth redistribution, sectoral policies, possible treasury difficulties and political risks, which are all dependent upon the context of each particular political economy. Schiff and Valdés (1992) showed how governments are caught up in a web of contradictory goals, including protecting farmers, protecting consumers from high food prices, raising revenues through taxation and ensuring the competitiveness of economic sectors in the world market. This makes decision making more complex than just embracing the principle of cost recovery. The question raised here is how governments can change their policy, for example, from providing public goods for free to charging for it, without providing compensation.

To conclude this section it is interesting to draw a parallel between charging for irrigation water and charging for groundwater use. Charging for groundwater use is backed by strong economic justifications because of the critical costs of overdraft in terms of land subsidence and increased flood risk and damage. Yet the constraints faced in establishing such charges illustrate what is at stake. Groundwater use mostly concerns industries in BMA and has remained admittedly underpriced, largely because of the political clout of both the Federation of Thai Industries.[11] All in all, charging for irrigation water use may be a more difficult business – both socially and technically – than charging for groundwater, which lends itself much more easily to control and volumetric charging.

Recent Attempts to Reform the Water Sector and Future Prospects

Further to the 1997 financial crisis, Thailand obtained a $600 million loan from both the ADB and the Japanese Bank for International Cooperation under the name of Agriculture Sector Program Loan (ASPL), conditional upon acceptance of some principles and a reform of the water sector (RWS). A policy matrix was defined, showing commitment and successive milestones to be achieved. The RWS was designed by consultants to the ADB and issued in March 2001. It included several components (H&P and A&E, 2001):

- Strengthening of the Office of the National Water Resources Committee (ONWRC) and transforming it into an apex body;

[11] The federation opposed a gradual rise of the groundwater price (from B3.5 to 8.5/m^3, in an attempt to catch up with tap water at B12.5/m^3), stating that a price of B5 would 'lead to hardship'. Recently, the Thaksin administration seems to have adopted a more energetic stance and given deadlines for the phasing out of wells in areas where pipe water is available.

- Decentralization of water management to river basins;
- Watershed protection strategy;
- Setting of performance indicators and service standards;
- Participatory irrigation management (PIM) and definition of farmers as clients rather than beneficiaries;
- Cost-sharing of O&M;
- Reorganization, decentralization and privatization of RID.

In parallel, the National Water Resource Committee was drafting a Water Law which was supposed to encapsulate many of the crucial aspects of this ambitious reform, notably the establishment of River Basin Committees (RBCs), and the separation of the water policy, management and O&M functions. It is beyond the scope of this chapter to discuss the merits of the proposed reform but the aspects of cost-sharing, service agreements and participatory management are relevant to our current discussion.

The RWS aimed at establishing a contractual relationship between RID as *provider* and farmers as *clients*. It was expected that such agreements duly defined through established standards and monitored through performance indicators would significantly increase the quality of delivery, thus justifying the principle of cost-sharing put forth (as opposed to cost recovery). This would set in motion a virtuous circle whereby farmers would get financial autonomy and better service, while participating fully in the definition of operational targets and maintenance priorities. This virtuous circle is well identified in the literature (Small *et al.*, 1989; Small and Carruthers, 1991; see Molle and Berkoff, Chapter 1, this volume) but it has several prerequisites that were overlooked in the RWS.

The first crucial weak point of the reform was that there was no provision to ensure that RID will deliver water, following standards of service agreed upon. By failing to link RID's financial income to such service, no drastic pressure would be put on RID to reform its management and it is highly doubtful that raising their awareness of the necessity of change by seminars or capacity building would be sufficient to ensure this. When fees contribute significantly to the salary of the officials of the agencies, or are used to pay field staff who are selected by the users themselves, there is a real change in the governance pattern of irrigation. This, of course, was the most contentious part of a reform and the one that was likely to be compromised.

Service agreements were supposed to be established between users and RID but little was said about whether the existing human and physical capacity needed to achieve this, exists or not. After the early overemphasis on structural aspects, it has now become all too common to disregard the physical dimensions of management and to overlook their impact on reforms (Briscoe, 1997; Facon, 2002). Water management in the Chao Phraya basin is constrained by various aspects, including the lack of control over abstraction along the waterways, the occurrence of side flows, the crude technical design of most hydraulic regulation structures and the development of conjunctive use by farmers (Molle *et al.,* 2001; Molle, 2004). This makes the definition of service agreements at lower levels extremely problematic. The RWS made no provision to ensure that hydraulic regulation was up to the task envisaged. It just assumed that 'farmers will receive improved irrigation service delivery. Farmers need to feel confident that service is being improved' (H&P and A&E, 2001).

Initial service agreements were to be developed at the project level between RID and Water User Groups (WUG): '[A]s soon as WUG get ready . . . as federation of water users moves up the system, to IWUGs and WUAs, service agreements will move with them.' This was the second weak point of the reform. As is the case in many failed reforms of PIM, farmer organizations are first built at the tertiary level. This is easily accepted by irrigation agencies because they usually have no interest in what is occurring beyond the tertiary turnout and blame for deficiencies can then be placed if required on the farmers themselves. Since certainty in supply at the tertiary level generally depends on allocation and distribution at higher levels in the system and cannot be fully

ensured, farmers soon discover that there is nothing to be managed and that they are wasting their time. Present reforms still consider water management at the tertiary level and maintenance as crucial issues but these may actually have lost importance in the eyes of farmers. As a result of the ongoing decentralization process, local administrations have seen their budget increasing and are now using the resources under their control to fund maintenance (notably mechanical ditch dredging). Likewise, the organizational needs of water management have been radically changed further to the introduction of direct seeding in lieu of transplanting, the development of secondary water sources and the spread of pumps. This has weakened the exigency of collective action and fostered individual strategies.

In contrast, the issue that has gained prominence in a context of water scarcity is the allocation of water in the dry season (Molle, 2004). The process towards involving users in management should be initiated by allowing a transparent allocation process in which users would have representatives at each level (main canal level, scheme level, plus the delta and basin levels for farmers in the Chao Phraya delta). The definition of (seasonal) entitlements in which users have a say (as a first step to defining water rights) is the preliminary step to the definition of service agreements. Such agreements must be accompanied by a technical capacity to operationalize them, to monitor distribution and to assess whether the actual and the agreed supply match. This, again, has technical, managerial, legal and political implications that need combined support from the government, the political class and the society, which does not seem to be forthcoming. A part of RID officers' foot-dragging in considering the issue might be linked to the fact that establishing service agreements and a water charge may eventually backfire, in that farmers would be given 'the legal standing to bargain forcefully with the water conveyance bureaucracy for timely and efficient service' (Rosegrant and Binswanger, 1994).

The reform process initiated under the ASPL has been phased out during 2002 and 2003. Pilot projects have been implemented partly, and without supervision, leading to no real change. Cost-sharing policies and service agreements have disappeared from the front scene. The draft Water Law has been shelved. The restructuring of RID has been limited to measures such as the non-replacement of retiring staff. Only the setting of RBCs has proceeded, under the guidance of the ONWRC. At present, however, RBCs still lack the formal recognition that would give them more importance than a mere consultative forum. The failure of the reform can be partly attributed to some of its internal weaknesses (over-optimism, structural constraints to the definition of service agreements, misplaced emphasis on building from the tertiary level, etc.) but was chiefly undermined by the lack of support from the Thai side, from both bureaucratic and political quarters. Its final dismissal came with the decision of the Thaksin administration to discontinue loans from the ADB. This failure exemplifies disregard of what Briscoe (1997) considers the first requirement for reform: that there be a demand for it. However sound and well intentioned they may be, reforms decided and imposed by external institutions have little chance of succeeding.

In addition to the lack of strong political commitment and support, and of structural rehabilitation, the reform failed to ensure the crucial point of financial autonomy. Financial autonomy makes the water charge a 'glue factor' in a wider process of transfer of responsibility to users, who can decide on the hiring of staff and the priorities in maintenance which are ensured by their own funds. This factor, crucial in the Mexican reform, was absent from the ASPL and raises the question of whether a partial reform can achieve partial benefits or whether it is doomed to failure because of the absence of crucial linkages in the virtuous circle to be created.

Conclusions

Pricing mechanisms are often held as a potential tool to help 'rationalize' the use of water in ways that increase the economic

efficiency of both water use and allocation. Application of such measures has been met with some success in the domestic and industrial water sectors but has so far failed to produce convincing examples in the large-scale public-irrigation sector of developing countries. In the particular case of Thailand, both the rationale and the applicability of such measures were found to be problematic.

The idea that water waste would be a consequence of the non-pricing of water was little supported by evidence. The closure of river basins, most notably the Chao Phraya basin, is accompanied by reductions in losses, both at the farm and the basin level, with only 12% of dam releases in the dry season lost to non-beneficial use: a reality which contrasts sharply with the image of outright waste that is routinely conjured up to justify pricing as a way to induce water savings. The technical impossibility of establishing volumetric water deliveries, as well as the wholesaling of water in the present context, removed the possibility of influencing users' behaviour through pricing. Even if this is possible, there are indications that the elasticity of water use is very low at the range of prices proposed to meet appropriate cost recovery objectives, in addition to the political difficulties in implementing them.

The possibility of inducing land-use shifts towards crops with higher water productivity runs into similar difficulties. It was shown that farmers' decision making gives much emphasis to risk, and that water savings or water productivity objectives do not necessarily coincide with income maximization. To assume that there are substantial gains to be expected from shifts in cropping patterns if water is priced is to misunderstand the dynamics of, and constraints to, diversification. If much higher profits could readily be made through diversification, farmers would not wait for this. To penalize rice because of its higher water needs would only raise the vulnerability of the main crop, without making alternatives more secure or removing the other constraints to diversification, particularly the need of stable markets. Likewise, few economic gains can be expected from intersectoral reallocation of water, as non-agriculture sectors are already given de facto priority.

The principle of cost recovery is generally propped up by an image of irrigators who have unduly benefited from government largesse and are expected to pay back the 'taxpayers'. This was confronted with the net transfer of wealth from agriculture to other sectors, symbolized in Thailand by 30 years of rice premium, and with the multifaceted benefits of irrigation accruing to the society. It was also recognized that political considerations and national challenges, such as food security, rather than mere aspects of return to capital, dictated earlier priorities in state investments and that shifts in policy are not easily justified and implemented.

A water charge would be akin to a flat tax that would decrease farm income, without effectively sending a signal of water scarcity, and decrease international competitiveness (especially with regard to western countries that continue their policy of subsidy), while it would not be easily passed on to the consumer because of the strong linkages between domestic and world rice markets. While reductions in price subsidies in developed countries are compensated for by adequate income policies, the latter are generally omitted in developing countries (partly due to the difficulty in implementing such income-support schemes). Shifting, even partly, the O&M costs to the users is helpful in internalizing costs from the point of view of the government and signalling to all concerned the real cost of system O&M. It may help ensuring financial sustainability if public budgets happen to be lacking, but has socio-economic and political implications that need to be addressed.

Beyond 'the obsessive traditional concern on the part of resource economics with correct pricing levels for irrigation water' (Svendsen and Rosegrant, 1994), water pricing is made more attractive when it is construed as a binding element of a wider mechanism that redefines relations between users and the agency (Small and Carruthers, 1991; Bromley, 2000). It gains sense if a full reform is implemented that includes a degree of turnover and financial autonomy whereby water delivery service is paid for

by users and linked to the quality of service. Service agreements should include definition of the allocation of resources and of the timing of the distribution of allotments. In both processes, the users should have a say, given their importance in a context of scarcity. Modifying the status of public agencies and civil servants in order to link their salary to performance and to the payment of users requires a much more ambitious reform in the direction of which the government has so far taken no unequivocal steps.

The failure of the ASPL reform illustrates several lessons that failed to be learnt, in particular, the importance of infrastructure in the design of service agreements or bulk allocation, as well as the necessity to muster internal and political support for the reform. Emphasis thus, should be placed on paving the way for a thorough reform, ensuring in particular, the technical and managerial capacity to define and operationalize services, as well as the legal framework and the political/public support for changes in line agencies. Failing to alter the pattern of governance jeopardizes reforms which remain generally restricted to isolated components, backed by arguments that are turned invalid. It is not clear, therefore, whether 'half-measures' provide 'half-benefits', and must be seen as 'second-best' options, as economic parlance suggests, or if they are likely, because of the absence of linkages and invalid supporting assumptions, to fail and lead to an overall negative result, rather than to the theoretical gains envisioned. All in all, it appears unwise to propel water pricing to the fore of the reform, as a symbol of restored economic orthodoxy, when it is expected to play a more crucial and later role in a wider and longer reform process.

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IN : **Irrigation water pricing : the gap between theory and practice**

2007

Auteurs **MOLLE FRANÇOIS (ED.)**, BERKOFF J. (ED.).

Source Oxfordshire : CABI, 2007, 14 p. + 347 p. (Comprehensive Assessment of Water Management in Agriculture Series ; 4). ISBN 978-1-84593-292-3