Water charging in Macedonia: full cost recovery in practice

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1. Introduction

Full cost water pricing has been presented as an important solution to many dimensions of the water crisis, in documents such as the EU Water Framework Directive or the World Water Vision. Full cost pricing would encourage efficient water use, would facilitate reallocation of water from low to high value consumers and would overcome the persistent under funding of maintaining basic service levels of water utilities – be it in water supply, water treatment or irrigation. In spite of this around the world full cost water pricing is the exception rather than the rule. In irrigation this applies even more than in domestic water services. There are hence not many cases that can validate or falsify the policy assumptions that are associated with full cost water pricing.

Macedonia is one such exception, and probably an unlikely one. Full cost pricing – aimed at the recovering operational costs and capital costs - has far a long time been the basis for agricultural water pricing in the country, that prior to independence was the poorest of the six republics that made up the socialist Yugoslav Federation. Irrigation moreover was and still is provided by Water Management Organizations, that are in principle autonomous. This water charging mechanisms has had to weather the economic and political turmoil of the last ten years. This period saw the fortunes of the republic change and Macedonia re-emerge as a low-middle income country. GDP contracted to 75% of 1991 levels due to a variety of reasons: the dismantling of the Yugoslav Republic, which had offered a de facto free market for Macedonian agricultural products and an assured flow of central level subsidies; the economic blockade by Greece over the name of the newly formed country and most of all the dramatic conflicts in the Balkan, destroying markets and destabilizing Macedonia itself too.

At present GDP in Macedonia is 1690 US $/ capita. The contribution of agriculture in the economy decreased. It was 13.6% in 1991 of GDP and is 10.9% now. There are no reliable statistics on the proportion of population engaged in agriculture, due to the fact that many persons are part-time farmers (see next), but estimates put the figure close to 10%. Agricultural incomes appear to be at par with incomes in other sectors. Though unlike other countries the farming sector is not substantially poorer, there is a noticeable out migration of young people from rural areas, in search for more exciting livelihoods elsewhere.

Irrigation and drainage in Macedonia

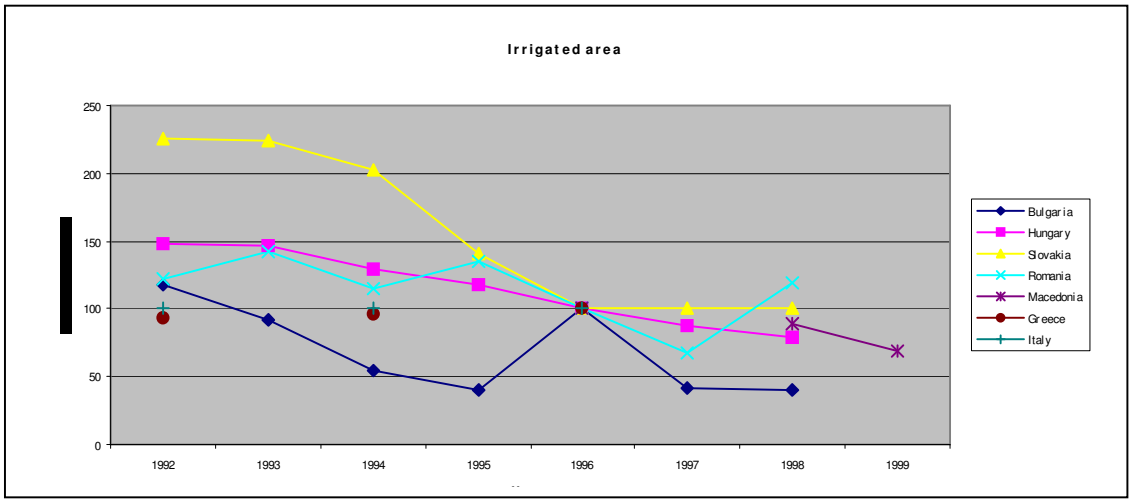
The developments in the irrigation and drainage sector mirror the general trend in agriculture of the last ten years and the area under irrigation declined. Average annual precipitation in Macedonia is 733 mm, but in the hilly environment of the country there is great variability. The western part of the country is distinctively more humid and rain-fed than the east. In these areas some irrigation schemes mainly provide supplementary supplies in dry years, whereas in wet summers irrigation demand can drop close to nil. In the drier eastern region demand for irrigation is less variable. The main irrigated crops are grapes, vegetables, tobacco, alfafa and until recently paddy. Supplementary irrigation is provided to wheat.

Most precipitation comes in short, intensive periods. With the exception of a few free intakes, irrigation is mainly supplied from multipurpose reservoirs. The first large dam in Macedonia was constructed in 1938. At the end of fifties – as elsewhere - the dam program accelerated. Between 1952 and 1982 18 more large dams were constructed in Macedonia, after which dam construction more or less came to a halt. Out of the current19 reservoirs from high dams 16 provide irrigation services (typically covering between 1000 to 5000 ha) – usually in addition to hydropower. As returns from power generation are higher, irrigation supplies usually take second priority in such multi purpose systems. In addition to the large dams there are over 120 small dams, that provide water for irrigation, domestic supply, fish breeding or local industry. The irrigation systems are often extensive and heavily engineered – as may be expected in the mountain topography. The majority of farmers depends on these major systems as their single source of water. In a recent survey only 24% of farmers used an additional source, a small spring, well or river diversion (MCG 2002).

The total area equipped for irrigation in Macedonia officially stands at 163,693 ha – close to 25% of the arable land in the country. But a large part of this area has never been irrigated and distribution networks were not constructed. The maximum area irrigated at one time has probably never exceeded 100,000 ha.

At present an even smaller portion of this area - 27,000 ha in 1999 (16%) - is irrigated, according to figures from the Public Water Management Enterprise. Other estimates are more optimistic. The Macedonian ICID committees arrives at a figure that more than double of this. Clearly however underutilization is large. Such differences between actual and potential areas are common in other Eastern European countries too. In Bulgaria only 8%, in Romania 14% and in Hungary 41% of the officially designated command area is irrigated. Whereas in several parts of the world the discussion in recent years has been how to accommodate increases in irrigated area, given limitations to freshwater supplies and ecological demands for water, Eastern Europe as a whole has moved in an opposite direction. The actual irrigated areas have declined dramatically (see figure 1). As a pointer to the different fortunes in the different parts of the world, the area under irrigation in Greece slightly increased in the same period.

Figure 1: Development of irrigated area in Eastern European Countries



Source: Oko, 2001

The collapse of the privileged markets, the undoing of the collective marketing systems and the difficulty in these circumstances to maintain the sometimes rather sophisticated irrigation infrastructure explain the downfall of irrigation in Eastern Europe. In Macedonia all these factors have applied with force. During the period of theYugoslav Federation Macedonia was able to sell its agricultural commodities at premium prices. High quality rice for instance used to get the equivalent of US $ 1.5/kg. The demise of many agriculture and food-processing conglomerates (agro-kombinats) eroded the customer base for irrigation services. These events started a down-ward spiral. Damage went unrepaired. Non functional pump stations, broken canals and collapsed canalets among others further reduced the area under irrigation. In this context water saving – an important objective in water pricing policies otherwise - is not a priority in Macedonia but the survival of the public assets is and the delivery of services at reasonable cost is.

Irrigation in Macedonia declined as elsewhere in E Europe

Most farms in Macedonia are small. Data from 1994 show an average farm size of 1.29 ha – a figure that subsequently declined even more. Land fragmentation is large (more than 7 plots on average per farm). It comes as no surprise that part-time farming is common. In a sample of 125 farmers 32% indicated that they were part-time farmers and 61% had an additional source of income – from salaried employment, state social support or pensions (MCG 2002). There is a wide variation between different irrigation schemes and prevailing cropping systems. In commercial horticulture farms such are common in the central and eastern part of the country (Tikves region) net farm incomes are high and make up the main portion of farm income. In mixed farms and predominantly rainfed farms (as in the West), where wheat and maize are the most important crops or in the former rice growing areas (such as Bregalnica) net farm incomes are significantly lower and off-farm income becomes important..

Table 1: Annual farm income for different cropping systems (based on sample of 125 farms)

Cropping system	Commercial vegetables	Commercial vineyard	Mixed system	Rice system in decline	Rainfed cereals	Average
Per farmer, in denars						
Net farm income	678,957	356,471	45,028	56,936	16,517	230,782
Off-farm income	1,048	57,845	90,880	48,920	67,560	53,251
Farm income	680,005	414,316	135,908	105,856	84,077	284,032
Farm income (in US $)	11,930	7,270	2,380	1,860	1,480	4,980

Based on: MCG (2002)

3. Institutions and Governance in Irrigation

Irrigation services in Macedonia are provided by financially autonomous irrigation agencies – so called Water Management Organizations. In water pricing literature (Small 1989, Carruthers 1992, World Bank 1993) this is the material of textbook recommendation, yet in reality it has been hard to sustain service levels in the absence of fall back facilities, that comes with financial autonomy.

Twenty WMOs nowadays provide irrigation and drainage services. A single system in Macedonia may have one WMO, but the larger reservoirs typically supply water to several WMOs. One of the WMOs may look after the main reservoir, servicing others. In other cases the reservoir is managed by the Public Electricity Company. Apart from irrigation and drainage the WMOs are engaged in a number of other activities – river bed regulation, flood protection and erosion control, but also commercial activities such as construction, concrete works, operating hotels and the exploitation of fisheries in the reservoirs. This is not unlike other (former) socialist countries – including China. Table 2 gives an overview of the spread of activities of the WMOs. In some cases the commercial activities have become the main activity with irrigation cross-subsidized from the core business. In other cases commercial activities have been poorly managed and have become financial liabilities rather than assets.

The WMOs are registered under different laws. Most are listed under the Law on Enterprises (10), but a considerable portion is registered under the Associated Labour Law(8) or the Law on Public Enterprises (2). The WMOs registered under the Associated Labour Law have an assembly of employees and are mainly accountable to the employees. The WMO registered under the Law on Enterprises in principle have a different structure in which an executive board is prominent. Performance wise however there is no perceptible difference between the different types of organizations and in practice the difference in governance is less clear-cut. Some WMO that are registered as enterprises for instance have in their statutes incorporated a provision for an employee council too. Essentially however the WMOs are self-governed and self-regulated. In none of the boards interests or general public interests are represented.

In addition to these main service providers, 18 other legal entitities (cooperatives, trade companies, state-owned agricultural enterprises) provide irrigation services – 9 of which, usually farming conglomerates, provide services to themselves, but 9 other provide services to private farmers, though quite small in nature.

Table 2: Activities of the WMOs (no)

Water services	
Reservoir operation	4
Irrigation services only	10
Drainage services only	2
Irrigation and drainage services	8
Hydro-power	1
Other activities	

Sand and gravel mining	10
Fishery	9
Hotels	3
Construction works	11
Concrete works	5
Miscellaneous	6

Source: Arcadis 2001a

Under the Water Law of 1998 an effort was made to create a country wide Public Water Management Enterprise. As explained later at this time most WMOs were running at substantial losses. The unified Public Water Management Enterprise would put the house in order. All WMOs would loose their autonomous status and would become branch offices of the new organization. Several parties however developed cold feet at the planned time of transition of the WMOs to the PWME, at the end of 1999. The new PWME had begun to realize that the WMOs were saddled with substantial debts, incurred on losses on operations in the previous years. The PWME feared that it would sink immediately, if it took over these liabilities. On the other hand the few WMOs that were not running in red, in particular Strecevo (earning substantial income from power supply) lobbied hard to have the planned transition undone. It all led to a stalemate, that has caused considerable confusion as to the legal position of the WMOs. According to the Water Law the WMOs are part of the new central organization, in reality they were not registered as such. In the ensuing grey zone the PWME exercises some regulatory power over the WMOs – replacing directors of non-performing WMOs, coordinating lifeline subsidies and announcing cuts in the water prices. Particularly in the appointment process political backgrounds have become an important consideration in recent years .

From 1999 onwards water users association – called Irrigation Water Communities - have been formed – on a pilot basis and with the support of the World Bank financed Irrigation Improvement and Restructuring Project. Ten Irrigation Water Communities came into being – each in charge of a command area of approximately 80 ha. For want of a better option Irrigation Water Communities were registered as voluntary foundations. The implication was that they only had leverage over those farmers that registered as members, but not over other farmers in their command area. The Irrigation Water Communities went into contract with WMO to take care of water distribution and maintenance in their area against a 40% discount on the water price.

4. Irrigation water pricing

Water pricing in Macedonia is historically based on the principle of full cost pricing. The water management organizations were – and de jure still are - financially autonomous and have to generate their own income from water fees as well as from other activities. In principle water fees should be calculated on the basis of all operating expenditures *and* the depreciation of the capital expenditures. The depreciation costs are based on the historical costs divided by the expected lifetime of the investment. The system of calculating depreciation is regulated by law and is backward looking. The historical value of the infrastructure is revalued and then depreciated over the assumed life time (usually fifty years) of the asset. Because investments in water

infrastructure are bulky and irrigation infrastructure in Macedonia consists of the relatively costly medium-sized, reservoir based systems the depreciation makes up 40 to 70 % of the water price.

Capital cost depreciation – substantial part of water charges in Macedonia

As a result of these principles the water charges in Macedonia are even now among the highest in the world (table 3). Even though as explained next the straightforward full cost pricing formula has been abandoned in most water management organizations, agricultural water prices are significantly higher than they are in neighbouring countries. In Bulgaria for instance volumetric water prices are in the range of US $ 51/ha for maize for instance (requiring two irrigations) and US $ 8/ha fixed charge.

Table 3:
Water charges in US $ / ha in Macedonia (2000)

Crop	Lowest	Highest
Maize	70	141
Wheat	33	94
Tomatoes	96	285
Rice	135	312
Vineyards	77	156
Alfafa	79	238
Fixed charge	12	20

The turbulent developments of the last ten years are also reflected in the system of water charging in Macedonia. The heavy inflation just after the disintegration of the Yugoslav Federation forced four revisions of the water price in 1992 for instance.

The water price in Macedonia is made up of a fixed and variable portion. For a long time the fixed portion was equivalent to 50% of the total projected income. This adequately reflected the high proportion of depreciation in the overall costs. The variable charge was based on a per hectare price for the different crops with the price per crop loosely reflecting a generalized assumed water consumption. Direct volumetric charges were considered in Macedonia on

several occasions, but the cost of installing water meters, that comes with it, was found to be prohibitive, particularly as most farmers only operate very small holdings. Metered supply would only be of use if all farmers were federated in water user groups (irrigation committees). This process has just started. Moreover, with the falling irrigation demand, water demand management is not very opportune in Macedonia. Hence there is no rationale to introduce volumetric charging at this point in time.

Dispensation in payment after natural disasters is common too – frost damage in 1993, hail in 1995 and floods in 1996 all resulted in lower fee collection. The burden for it was borne by the WMO as part of good customer relations.

As the prospect for agriculture in Macedonia deteriorated in the nineties and more and more irrigated land was abandoned, the political feasibility of high fixed charges (50%) diminished. In the new Water Law of 1998 the fixed proportion was lowered to 10% of the total water price. This particularly affected the self-financing capability of the irrigation systems in the western part of the country. Rainfall figures are relatively high here; and the area irrigated fluctuates substantially from year to year. In a wet year no irrigation is required for maize and wheat. This lower demand immediately translates in very low revenues. Yet most of the expenditures in irrigation are given – capital costs obviously, but also much of the staff and the maintenance expenditures are made irrespective of the demand for water in a given year. In these circumstances volumetric pricing and sustainable irrigation operations are at loggerheads!

In most irrigation systems in Macedonia the formula by which water fees were calculated became opaque over time. A price once calculated became the basis for the prices in subsequent years – irrespective of changes in operating expenditures in those years. Officially water prices continued to make provisions for depreciation, but several WMOs had the value of their original assets largely written off, whereas others simply left depreciation costs out of the equation. This explains to a large extent the range in water rates between WMOs in table 3.

Neither is the correspondence between operational costs and water price one to one at the moment. One reason are the fee reductions, announced in the last two years, without a corresponding effort to control costs. As a result several WMO's would be making a loss, even if they were able to recover all their dues – which they are not (see next). A second factor are the multiple tasks that WMOs are involved in – making it difficult to allocate costs to the different functions. Efforts have been made to have separate accounts for the different cost centres .
The full cost pricing policy however also raises a more fundamental issue – which costs?

Most WMOs are heavily staffed – a left over of earlier days when the area under irrigation was more. A large part of the budget is spent on personnel; little on basic maintenance. Given the precarious financial position of the WMOs – in which also salaries are often overdue – there is a zero-sum dilemma in the self-financed WMOs - the money spent on maintenance is not spent on salaries. Table 4 gives a income statement of one larger WMO. The bigger issue is who determines the cost of operation. The WMOs are essentially monopoly-suppliers, that are weakly regulated. An attempt to bring the situation under control was is the proposed merger of all WMOs in one PWME, as described above.

With the establishment of the PWME a number of high-level interventions took place – but unfortunatley only at the income side and not at the cost side. In 1999 the PWME announced a

20% reduction in the water charges accross the board. The rationale was the expectation that with lower fees the recovery rate (see next) would go up. Another blanket reduction – this time of 10% - was announced in 2000. The assumption that a lower rate would encourage payment turned out to be naïve in the end – as recovery rates further eroded in these years (see next).

Table 4: Example of income statement of a WMO

Income Statement		
Kavardaci WMO 1999	US $ 1,000	in %
Revenue		
Agrokombinats	489	46
Individual farmers	285	27
Barter	71	7
Other revenues	110	10
Other operating income		
Government grant	64	6
Other income/ insurance	38	4
Total revenue	1057	100
Expenditures		
Staff costs	424	28
Depreciation	257	17
Materials, energy	125	8
Insurance/water damage	54	4
Contribution to PWME	34	2
Others	294	19
Write off bad debts	331	22
Total expenditures	1519	100
Total net loss	-462	-30
Area irrigated 1999	2862 ha	
Revenue in US $ / irrigated ha	37	
Expenditure in US $/ irrigated ha	53	
Net loss in US $/ irrigated ha	16	

The PWME was also charged with developing a uniform methodology in water pricing. The method proposed use standard unit costs – adjusted from system to system – for required maintenance levels. These standard costs were derived from assessments of maintenance requirements by the different WMOs - which were subsequently compared. The final methodology was drafted in 2001 and is to be implemented yet. In the meantime water prices are

based on historical levels – although reportedly the difference with newly calculated water prices are not very large.

However, all said and done, even though water prices in Macedonia are high, compared to the cost of other farm inputs water charges only take up a modest portion. Table 5 compares the cost for water with other variable costs (agricultural inputs and hired labor) and crop gross margin on the basis of a sample of 125 farms. Water charges typically never exceed 10% of the total variable costs. It seems that the willingness/ reluctance to pay – described in the next section - is less linked to the cost of water, as it is in the discipline and trust of the collection system and overall farm incomes.

Table 5: Comparison of water costs, other variable costs and gross margins/ha

	Water costs (US $/ha/yr)	Total variable costs (US $/ha/yr)	Gross margin (US $/ha/yr)
Grapes (red wine)	65	858	1757
Grapes (white wine)	111	1347	898
Onions	107	1767	4373
Beans	107	1321	6574

Source: MCG (2002), sample

5. Methods of fee collection

As in other countries, there is an official and an actual system of collection water charges in Macedonia. The official system, described in several clauses of the Water Act (box 1), starts with farmers indents, on which basis the WMOs prepare water management plans. The area under cultivation is then recorded by water masters. These water masters are responsible for opening inlets and valves of the pipelines and have a close understanding on what goes on. Water users – individual farmers and agrokombinats – are expected to pay their dues before the end of the year. Those that do not pay can in principle be disconnected.

Indenting in practice

In practice it has not yet been possible to follow the method for indenting as prescribed in the Water Law. To start with farmers are often either reluctant or do not bother to fill in indents. One WMO (Kocani) tried to popularise the indents by having them hand-delivered by the water masters to all 7000 farmer-customers. This resulted only in 30 indents. In other systems farmer indents are received, but never for the entire area.

The water management plans instead of the indents are based on historical irrigation and on information, informally obtained through local communities, whose leaders come to the WMO to discuss water needs. For systems, supplied by pumping stations the preparation of irrigation plans is more tricky, as the cropping pattern is mixed and the question is on which crop the irrigation schedule should be based. This is somehow done by the WMO and the schedule is informally communicated to farmers and agrikombinats. Among farmers it is common that to

prepare local schedule taking into account the time that suits everyone best (many farmers are part-time only). It is common to have a first irrigation for seedlings early May, whereas the irrigation season starts from 25 June.

Box 1

Billing and fee collection in the Water Law of the Republic of Macedonia 1998

Relevant sections for the billing and revenue collection procedures are given in the Water Law in article 101, 118, 119, 120, 141, 142, 146 and 147.

- Article 101 and 118 requires water users to submit crop plans/ water demands to the PWME for the following year by 30 October;
- Article 119 commits the PWME to prepare an annual irrigation plan before 30 November - which in case of unexpected dry conditions can be adjusted by 1 March;
- Article 120 commits water users to follow the annual irrigation plan
- Article 141 - 142 instructs the calculation of constant fee (charged on all irrigable land) and changeable fees (dependent on the acreage under different crops). The norm for fixed fee is 10%.
- Article 146 obliges the PWME to deliver to each water user the water quantity allocated in the annual irrigation plan, but makes an exception in case farmers did not submit an indent;
- Article 147 gives the PWME the power to stop supplies to water users that did not pay their charges.

Bill preparation in practice

Water bills are prepared on the basis of checks of the water masters, In some, not all systems, water masters have cadastre lists at their disposal. A problem is some WMOs is the increased reliance on temporary staff. While engaging temporary water masters makes sense as apart from repair work they have little to do outside the irrigation season (May-September), the drawback is that they are not familiar with the area and prone to make mistakes in reporting cultivated areas.

At the end of the season the water master submits his notebook to the WMO administration, where on the basis of this note book bills are prepared. Most WMOs process the data on cultivated area by computer, whereas others still work manually. The role of the water master in recording the area under cultivation is then crucial. The WMOs have the impression that the water masters are relatively accurate in their assessments, as differences would show from a comparison of previous bills and from farmers objecting on the bills. In some cases field checks are organized by senior WMO staff. Farmer interviews confirm that the billing is reasonably fair - the most serious complaint being that assessments are sometimes done superficially. The system in labour-intensive through and water master make up 10-15% of expenditures of the WMOs.

Once prepared, the bills are usually delivered by the water master, which works reasonably well. Trials to send bills by post failed as this was unreliable. Farmers have the possibility to object on the bill within 8 days. In Kocani WMO for instance this was done on 20% of 5000 bills sent in 1999. The objections usually concern plots that were not irrigated or overirrigated. Objections also often mention failed crops. Whereas crop failure is no reason not to pay, it is the beginning

of a process of negotiation. In general, the farmers who take the effort to object are the farmer that are willing to pay.

Box 2
Indenting and billing in Polog-Tetovo

According to the WMO in Polog-Tetovo the registration of irrigation is done by the water masters, who try to get as many indents signed by farmers, starting from 1 April onwards - the indents mention the plot, acreage and plot. This effort reportedly usually yields signed indents for 50-60% of the area, that is actually irrigated. As in wet years farmer do not need to irrigate, farmers tend to postpone the signing of such indents till the last moment. Signing an indent does not oblige one to pay, as in September a farmer can submit a claim that he did not irrigate. Apart form the indents according to the WMO field checks are organised in August-September to complete the record of irrigated land. The WMO in Polog-Tetovo is not completely confident about the water master records, in particularly the records of the water masters who are not permanent employees. Farmers interviewed were not familiar with the indents and field checks of the commission, but mentioned that the bills were prepared on the basis of water master lists and were reasonably accurate. The bills prepared in Polog-Tetovo are not very detailed: they mention the amount and previous years dues. As in Bregalnica the WMO has a computer system, operated by two data processors. The computer system allows one to check unpaid bills.

Several WMO no longer bill fixed charges. Officially fixed charges should be paid on the entire 'official' command areas,. Several areas however can no longer be irrigated due to damaged secondary channels or other reasons. It is common for WMOs to take such areas of the billing list: the revenue under fixed charges is relatively small and the willingness to pay of unserved farmers is nil. There are also areas which are not (or no longer) irrigated from the channel network, but that are supplied from informal river diversions. These are usually also not charged the fixed portion, even though one could argue that they benefit from the maintenance of the reservoirs.

A very recent development is the value-added tax on the water bills. VAT (17.5%) was introduced in 2000 in Macedonia. Irrigation water charges were not exempted from paying VAT. As WMOs are taxed on amounts billed rather than amounts received, non recovery of bills – a major issue (see next) – leads to huge losses. Some WMOs have responded by excluding notorious defaulters from the billing process. This has resulted in several WMOs in an additional reduction of 10% in billed amount. Though pragmatic, the 'moral hazard' in this development is obvious.

Bill collection in practice
Bills need to be paid by 31 December. The practice is however to extend the deadline till 28 February - the start of the new irrigation season. Non payment however has become endemic. It is now major problem for the WMOs – practically bankrupting their operations. Country-wide recovery rates have come down from 89% in 1992 to 42% in 2000.

One of the reasons for the low recovery is the general malaise in agriculture. A large number of farmers in Macedonia are part-time operators persisting with growing crops, that they can not make very profitable. Similarly, agrokombinats used to have a good payment record, but many of them are in solvency crisis. The dilemma for a WMO is then what to do – loose the customers all together?

Another reason however is the growing culture of non-payment, making those that pay look odd. This is reinforced by erratic water supplies from deteriorated infrastructure and mistakes in the billing process by (temporary) water masters. On top of it – political leaders, including the Minister, have made sweeping public gestures in which they announced the waiver of water charges – a gesture that they could not live up to, but did the damage just as well. The survey into farm budgets indicates that farms generally operate at a profit and that the water fees are – as in most other parts of the world – a minor expenditure item (see section 4).

Against non-payment of supplies WMOs have two sanctions:
- Taking defaulters to court
- Suspending water supplies

Up to 1993 all defaulters were taken to court. But when non-payment became rampant in these years, court fees soon ran so high that it endangered the financial position of the WMO. In recent years only groups of larger defaulters are taken to court - without much result. Cases have to be initiated within three years of non-payment. There is a long delay (3-5 years) in the processing of court cases. By the time a decision is taken inflation has taken its toll and the value of the dues has decreased. Many defaulters still refuse to pay –even when summoned by court. There are then not many effective sanctions unless the defaulter has a permanent source of income to confiscate. To illustrate the difficulty with the 'court route' one WMO (Kocani) spent US $ 200,000 in court fees in 2000 and was able to retrieve US $ 250,000.

The alternative sanction is suspending supplies. The 1998 Water Law gives this authority. In case of individual defaulters this sanction is not easy to enforce physically as both farmers that pay and that do not are on the same outlet, valve or sprinkler system. In addition there is serious political pressure not to enforce this measure. An example is the policy of Kavardici WMO to suspend supplies to defaulters in 1999 and 2000. This was shelved after considerable political pressure.

Where Irrigation Water Communities exist it is in theory easier to suspend supplies. Yet as there is no legislation that gives the Irrigation Water Community the authority of the entire command area and membership is still voluntary, there are still several farmers who do not come under the control of the Irrigation Water Community. The Irrigation Water Community have been relatively successful in collecting dues – with recovery in several Irrigation Water Communities close to 100%. Recovery among non members however is very low – often this non members already had a trackrecord of default.

A left-over from earlier days is barter. This practice is still accepted in a number of WMOs – particularly the rice-growing area in the east of the country. Based on officially announced rice price farmers bring part of their crop to the WMOs. The crop is weighted and its value is

deducted from the dues. The main problem with payment by barter is the logistical problem it creates for the WMOs and the problem of selling what is often a low quality product.

6. Conclusions and lessons

Effect of the low recovery on performance
The declining revenue from water fees coupled with general disappointing revenues from non core activities has seriously crippled the operations of the WMOs. Simple business theory would predict that the WMOs would adjust the cost of operations to the revenues. This did not happen. Even though the areas effectively irrigated fell sharply, staffing levels remained the same. Savings were made on the operational budget instead – with major repairs and replacements unattended too. Most importantly the WMO compensated their losses by defaulting on loans (in a few cases) and (in most cases) by not making provisions for replacement and no longer paying compulsory contributions to pensiun schemes, medical insurance and providence funds. By 2001 the combined debt of the WMOs had reached over US $ 8 M, more than twice the annual turnover in a normal year.

Because of the debts to these different funds, the majority of the WMOs had their bank accounts blocked. As a result they could only operate on a petty cash basis. Another side effect was that as no contributions had been made to the pensiun funds, no employee is interested in a pre-mature retirement.

The limited resources for operation and maintenance were supplemented by grants from different sources - the Ministery of Agriculture, Food and Water Management; the PWME, the Water Fund (footnote) – and in exceptional case from the local government. The total support from these sources amounted to less than 10% of total income though.

A strange situation occurred as water prices continued to be based on full cost recovery – in many cases including an amount for capital replacement. It turned the minority of water users into 'suckers' that still paid the full cost, including the capital replacement that would never happen. The discrepancy with defaulters widened, increasing the reluctancy to pay.

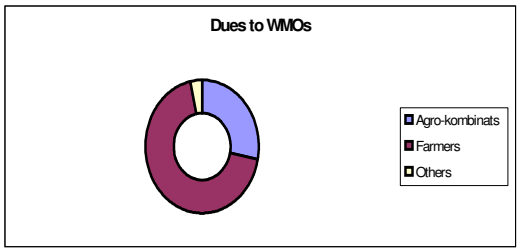
The total recorded dues from water users is more than the debts of the WMOs to banks and social funds and at US $ 396/irrigated ha are in the order of four times the average water fee. The water-related dues of nine WMOs investigated in detail were US $ 8.9 M, whereas the money owned by these WMOs to social funds and banks was US $ 4.9 M (Arcadis 2001b). Most dues are because of non-paying famers (see figure 2). Among those dues there is a large amount that cannot be recovered, because the time to do so has lapsed or because the original billing was disputed anyhow.

Experience with water charging
There are a number of lessons to draw from recent water charging history in Macedonia.

First is that revenue collection is more important than water pricing per se. The point is obvious but frequently overlooked. Documents such as the Ministerial Declaration at the Hague World Water Forum and the WorldWater Vision ('Move to full-cost pri cing of water services for all

human uses') pin much hope on full cost pricing. Without adequate revenue collection any pricing strategy is naïve however. In addition, when revenue collection starts to falter – the reverse of free-riding occurs: a small group of suckers bearing a large part of the cost, without adequate services in return.

Figure 2: Dues to WMOs – type of debtors



A second lesson from recent history in Macedonia is 'full cost pricing of what?'. Who decides what costs are part of the formula? The WMOs in Macedonia did not adjust their operations to a declining demand and reduced income. Staff expenditures remained the same and shortfalls were recovered from reducing operational costs and running large debts with pensiun finds and social insurances. As self-regulated monopoly suppliers the WMOs were unstoppable – the only options water users had was to pay an inflated price, default on payment or pull out. Full cost pricing needs to come with at least a modicum of user control over operations.

A third lesson from the Macedonia case is that there are the limitations to volumetric pricing. Unlike arid and semi-arid regions, the demand for irrigation services in semi-humid areas varies considerably from year to year. With volumetric pricing income from irrigation would not be stable, whereas most expenditure s in irrigation are fixed. There is a mismatch between financially sustainability and demand management.

A fourth lesson are the drawbacks of financial autonomy. While it has ensured that the system continued to be operated, it has done so at a cost – deferred maintenance and huge debts with pensiun funds and social security funds. In all the financial hardship the last item on which cost were saved were staff direct salaries.

A final lesson is the prerogative of agricultural development. When agriculture is in decline, it is hard to maintain the irrigation infrastructure. The risk is that the irrigation water may come a bottleneck later when agriculture is in upswing again.

The way forward: business planning

There is no easy solution to the fix in which the irrigation sector in Macedonia has landed. The policy of financial autonomy and full cost pricing – so often recommended as a best practice – has not worked in a period of contracting agriculture. In restoring balance and repair the self-financing capability of the WMOs it is argued that a broader business planning approach is required. This would look at all options:

- Changing water prices – following a process that is more transparent and give more room for communication and confidence building with customers
- Improving recovery - this would require more effective sanctions to defaulters and simplifying billing procedures;
- Reducing costs – by streamlining operations, divesting loss making non core business and decentralizing functions to irrigation communities
- Introducing new methods of cost calculation – avoiding the straight depreciation formula and replacing it with forward projections of long-term maintenance and rehabilitation needs
- Extending coverage – restoring irrigation and drainage services so as to increase the revenue base, but on the other hand also considering closing down systems or parts of systems that are very expensive to operate.
- Devolving tasks to Irrigation Water Communities – thus reducing costs and improving performance in payment recovery. What is required though is that new legislation is approved that would fully authorize the Irrigation Water Communities to take care of all water management activities in their respective command areas – including sanctions against defaulters or farmers vandalizing the system.

Apart from putting the house in order, the damage of the past – the huge debts that the autonomous WMOs have incurred – needs to be resolved. As long as they are there – it is hard to see how the irrigation sector can move out of the fix. In the meantime no proper financial management is possible, because the WMOs can no longer maintain bank accounts, but have to operate all their financial transactions on a petty cash basis.

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