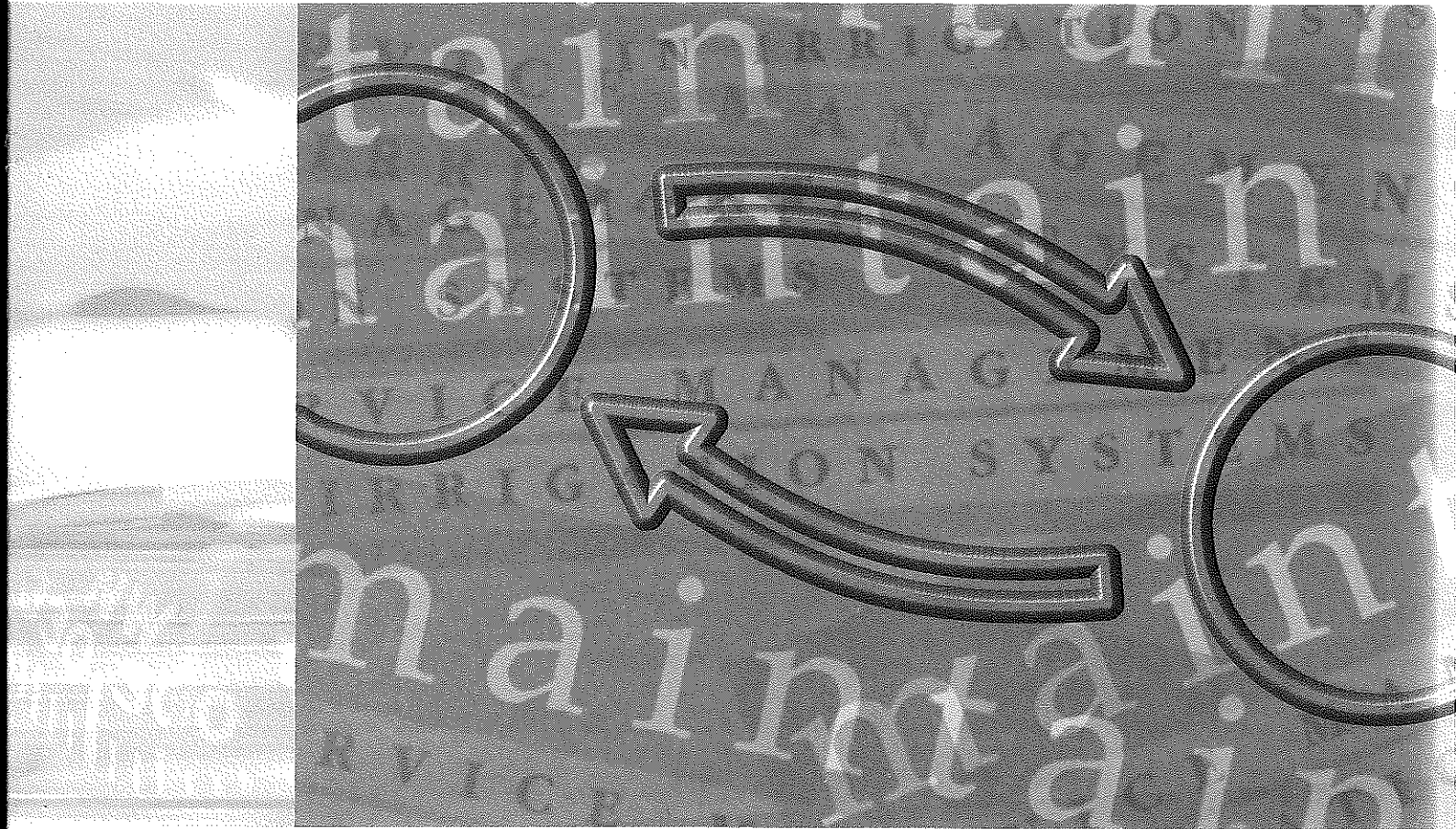


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Division 45
Rural Development



Thilo Hatzius

The Case of New Water Fee System in the Republic of Macedonia

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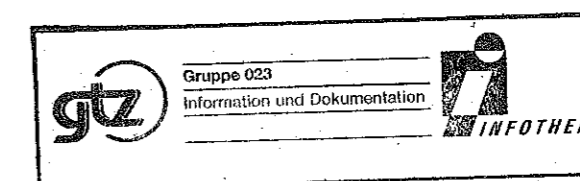
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Dr. Thilo Hatzius

The Case of New Water Fee System in the Republic of Macedonia

Market and Non-Market Failure in Path Dependent Institutional Reform

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Abbreviations

CPR	Common Pool Resource
EU	European Union
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
ICID	International Commission on Irrigation and Drainage
IIMI	International Irrigation Management Institute
IRRP	Irrigation Restructuring and Rehabilitation Project (World Bank)
JICA	Japan International Co-operation Agency
MAFWE	Ministry of Agriculture, Forestry and Water Economy
NGO	Non-Governmental Organisation
NPE	New Political Economy
NWL	New Water Law (of 1998)
O&M	Operation and Maintenance
PWEE	Public Water Economy Enterprise
PWF	Public Water Fund
SCBA	Social Cost Benefit Analysis
UN	United Nations
WDI	Water Development Institute
WME	Water Management Enterprise
WMO	Water Management Organisation
WMWO	Water Management Working Organisation
WUA	Water User Association

Keywords

Republic of Macedonia, Southeast-Europe, water price system, path dependency, institutional reform, natural resources management, institutional economics, transition countries, water economy sector reforms

Abstract

Macedonia with a population of about 2.2 million only gained its independence from Yugoslavia as recently as 1992. Institutional reform in the water economy sector of Macedonia is a particularly complex and urgent problem area. Complex - because of the predicament stemming from its geographical location, from the uneven spatial and timely distribution of water in the country, and from its very particular geo-morphological, historical, political, religious, ethnic, and, consequently, economic situation. Urgent - because Macedonia's economy and its agricultural sector in particular is in a precarious state. The importance of agriculture in terms of agricultural population has decreased from 72% to 12% in the years after World War II. In terms of the trade balance there have been extreme variations, a function of the changing political situation within the country and outside, the UN trade boycott against Yugoslavia, the temporary boycott by its southern neighbour Greece and recently the war in neighbouring Kosovo being the more important negative factors. Between 1990 and 1995 the share of agriculture in total trade varied from 7 to 17%. In terms of water used, about 62% of the total of 1.846 mill m³ water consumed in 1996 went to the agricultural sector, with an additional 11% going to fish ponds. 11.6% have been used for municipal water supply, 14.8% for industry. Of the arable agricultural area of 665.000 hectares about 400.000 have a potential for irrigation, 123 100 ha have irrigation infrastructure in some form or other - but only 36 146 have been irrigated in 1999.

The paper analyses some of the reasons for the decline in irrigated area which is explained to be transitory and related to failing markets and non-market institutions, path dependency, design problems in formal institutions and time lags in the adaptation of informal institutions to the changes in formal ones. The result is an inadequate incentive structure for stakeholders, the principal ones being public sector institutions, the public water economy enterprise, the regional water management organisations (WMO) with the people working therein, and, last not least, the farmers. The insufficient organisation of irrigation farmers, the decreasing propensity of farmers to pay the ever increasing fees for deteriorating services of the WMO, and the bad state of irrigation infrastructure are identified as central causes and effects at the same time, resulting in a vicious circle which is hard to get out of. Some features of the institutions decreed by the New Water Law of 1998 intend a re-centralisation of the Macedonian water economy sector and the creation of the Public Water Economy Enterprise are seen to go against the insights gained in recent years by development practitioners and academics working on water resources management. The paper, after defining four principal problem areas, applies concepts of neo-classical and new institutional economics to develop elements of a conceptual framework for the design of an appropriate

institutional configuration for the water economy sector and a corresponding new water fee system. In its concluding section some tentative answers are given to the questions asked in the first one, the central conclusion being that institutional design and its implementation in the case of the Macedonian water economy sector is a path dependent process of trial and error rather than a straightforward blueprint affair, requiring much patience, flexibility and innovative capacity of the people involved.

1 Introduction

The transition from a centrally organised to a decentralised market economy is a complex process. The pace of this transition has certainly been overestimated in the case of most Eastern European countries. Private investors with their own capital at stake as well as policy advisors involved in assisting governments in the revision of the institutional framework and in the design of policies promoting structural change are increasingly concerned about the limited positive impact reforms have had on the performance of markets and of public, semi-public and private organisations, on the performance of the economy, on the political and social situation in these countries and, consequently, on the well-being of its people. In Macedonia, institutional reform in the water economy sector is a central area of concern of donor countries, and a particularly complex and urgent one. Complex - because of the predicament stemming from its geographical location, from the uneven spatial and timely distribution of water in the country, and from its very particular geo-morphological, historical, political, religious, ethnic, and, consequently, economic situation. Urgent - because Macedonia's economy and its agricultural sector in particular are in a precarious state and because the ambition to join the EU will require some serious changes with respect to the organisation of the economy. Instead of a planned process of institution sequencing and timing, including privatisation of property rights, however, a process of trial and error takes place suggesting some doubts on the generally assumed model of economic policy as a rational, linear, target oriented process.

This traditional approach to economic policy assumes the goals in terms of a social welfare function to be known, the basic structural relationships of the economy to be well understood and a set of tested and controllable policy instruments and measures to be readily at hand, thus allowing a high degree of certainty with respect to the outcome. In our particular case, this would mean a set of institutions and organisational arrangements leading, if properly applied and sequenced, to effective and efficient transactions among actors within markets and within organisations, to the elimination of inefficient institutional arrangements, to prosperity of the economy and to long lasting economic growth. This concept of economic policy might be in the back of our minds - of decision makers in the governments advised and of their policy advisors. The author of the present paper, one of the latter group, is less optimistic. Theory as well as practical experience indicate complexities which seem to justify his opinion. The theoretical concepts presented in this paper might contribute some useful elements to the ongoing discussions on institutional reforms related to the introduction of a new water fee system in Macedonia.

2 Market failure, non-market failure and path dependency - some specifications

The terms *market failure*, *non-market failure* and *path dependency* mentioned in the title of this paper refer to central issues in institutional reform and require some further specification. *Market failure* is a widely used term and well-known concept in mainstream economic theory. New institutional economics, however, has an

extended understanding and research agenda of *institutional failure* which includes both *market* and *non-market failure*. The latter term refers to failures within non-market institutional configurations, organisations or governance structures. A *first type* of non-market failure is inherent in state and non-profit organisations usually financing their activities from financial transfers not earned in the market. As a consequence, they lack competition, the much praised efficiency enhancing mechanism inherent in this institution. A *second type* of non-market failure is due to asymmetrically distributed information leading to strategic behaviour of economic agents and to the corresponding phenomena of shirking, moral hazard and adverse selection also present in private market and profit oriented firms. These failures lead to high transaction costs and inefficient and ineffective outcomes. Development and resource economists have gratefully taken up these concepts as they explain, at least verbally and sometimes illustrated with simple game analytic models, phenomena and facets of reality which are particularly relevant for the subject matters they are dealing with. Neo-classical economists, excluding some of these facets, on the other hand, have the practical tools and problem oriented methodologies at hand leading sometimes to more straightforward (and perhaps too simplistic) answers for policy makers. Both, however, have their merits and both theories will be referred to in this paper.

The term *path dependency* is applied in different ways by economists and other social scientists. Some of the corresponding concepts are considered relevant in institutional reform within the water economy sector. In *neo-classical economic theory* path dependency sometimes refers to problems of asymmetries in the reaction of some economic variables to changes in certain other ones, usually prices. This means, the resulting effects depend on the direction of the change, the reaction to a price increase is not symmetric to the reaction in the decrease in the price. The term is furthermore used in the context of an investment in 'lumpy' infrastructure. The high initial costs create path dependency for subsequent decisions because of a high fixed cost component¹. Investments in infrastructure for the provision of water storage and distribution structures often have the characteristic of lumpiness – mainly for technical or economic reasons: to take advantage of economies of large scale production in the provision of services². This case is often referred to as 'natural monopoly' because access for competitors is restricted or impossible. As effectiveness and efficiency enhancing competition is absent in these cases, special care in setting the right incentives in the design of institutions to provide these services is needed. The provision of infrastructure by public entities and the necessity of marginal cost pricing, both assumed to be straightforward solutions to the *provision and financing problem*, are often neither needed nor recommendable and sometimes not even possible³. As will be shown in the second section of the theoretical part of the paper, the intrinsic properties and the demand and supply conditions of the goods involved give indications as to an efficient and effective way for their provision and financing – either by the market or by some public, communal, non-governmental or mixed institutional configuration.

For *evolutionary and new institutional economists*, on the other hand, path dependency refers to the historical dimension of institutional change, to

irreversible self-enforcing tendencies resulting from 'network-externalities' and 'learning-by-using', to cultural factors and to lags in the adaptation of informal institutions to formal ones as well as to time lags in the adjustment of perceptions of stakeholders⁴. In case these adaptations and adjustments do not take place the way assumed, the incentives and opportunities brought about by changes in formal institutions will not positively influence the behaviour of stakeholders but rather lead to adverse effects on efficiency, on the distribution of assets and income as well as on economic growth and, as a consequence, on the social and political situation of the countries or sectors concerned.

This phenomenon can be observed in the case of the Macedonian water economy and particularly in the irrigation sector. The New Constitution, the New Water Law (NWL) and the institutions specified therein, including the 'new water fee system', give indications of a formal institutional set-up which, to a large extent, has not yet been implemented and thus has not led to the expected positive adaptations of informal institutions, of peoples perceptions and of the behavioural patterns of stakeholders. The design and introduction of a new water fee system is thus part of a more general implementation problem and must not be seen in isolation from the whole process of institutional transformation. The paper will therefore discuss some issues concerning inconsistencies in the NWL and deficiencies inherent in the general institutional configuration of the water sector specified therein. It will need to be discussed with policy makers and stakeholders within the water economy sector.

The four sections in the first part of the paper will refer to current issues of institutional reform within the Macedonian water economy sector. The titles are formulated as questions to which the concluding section of the paper will give some tentative answers. These answers are partly derived from the insights gained in the second part of the paper. The titles of the three sections of this theoretical part starting with an I are: '*Institutional imperfections and failures*', '*Intrinsic properties of water and water related goods and services*', and '*Institutions for irrigation provision and financing*'.

3 Issues of institutional reform in the Macedonian water economy sector

3.1 The Public Water Economy Enterprise and its regional branches: transitory or design immanent incentive problems?

The central problem of the Macedonian water economy sector at the moment is the rapid deterioration of the financial situation of 24 regional Water Management Organisations (WMO)⁵ now to be considered regional branches of the Public Water Economy Enterprise (PWEE). The PWEE was founded in 1998, based on Article 137 of the New Water Law (NWL) of the same year. The creation of a public sector enterprise has to be seen as a consequence of the New Constitution changing water from a socially to a state owned natural resource. According to the NWL, the WMO should only perform tasks of public interest assigned to the PWEE⁶ and the latter should be organised according to the Law On Public Enterprises. In reality, however, WMOs are still working as separate decision-

making units under the Law on Associated Labour of 1976 and the Law on Enterprises of 1988, allowing them to work as Water Management Working Organisations (WMWO), Water Management Enterprises (WME) and Limited Liability Companies. This is reflected in a sometimes incoherent mixture of activities, some profit oriented, some others of public interest. Their accounting systems do not have a unique account plan. Accounting systems only satisfy the legal requirements of historical record keeping and tax collections and are not designed as a management instrument. To date accounting systems in most WMOs do not allow to distinguish activities losing money from those gaining money. They do not allow to determine which activities are cross-subsidising others, nor do they allow to calculate cost centre specific full costs, a precondition for the calculation of real cost based water fees.

In the past, water fees have been oriented in covering the ever increasing general losses with no relation whatsoever to real costs nor to the marginal value product of water in agricultural production or to user's ability to pay⁷. This has led to a vicious cycle of decreasing recovery rates, decreasing quality of irrigation services, decreasing agricultural land irrigated, increasing liquidity problems, further increasing water fees etc.. An unofficial report on four pilot schemes supported by the World Bank states that "all four WMOs recorded a net loss for 1999. For three of them the ratio shows a worsening situation, compared with the previous year, while the one which recorded a relative improvement in performance ... still had a net loss of nearly 50% on sales" (Lee, 2000: 9).

On the *water demand side*, the situation might be explained in terms of the general crisis of the economy, the almost complete elimination of subsidies in the agricultural sector and the deteriorating market production and cash income of farmers; on the *water supply side* the situation might be explained by the deteriorating physical capital which lacks maintenance, reinvestment and modernisation leading to high costs, inefficient, untimely and low quality water provision services. In terms of institutional failures some explanations would be the difficulties in the start-up of the new public enterprise, the lack of, or wrong incentives for stakeholders on the demand and supply side, the lack of management experience of PWEE and WMO staff and of inadequate management tools. These problems might temporarily be solved by the injection of financial capital, by training and up-grading of personnel. In the medium and long run, however, only an appropriate institutional configuration will guarantee institutional sustainability avoiding as far as possible the evident incentive problems caused by non-market institutional failures.

For institutional economists and sociologists, on the other hand, the situation is a case of gradually deteriorating social capital. Sociologists⁸ will note the general loss of trust. Trust between stakeholders, between farmers and WMO personnel, between employees and staff, between civil servants on the local and on the central levels and, last not least, trust into any statement of the political leaders. Institutional economists, on the other hand, will point to the lack of positive incentives or to the wrong incentives within an incoherent institutional configuration, and to asymmetrically distributed information leading to shirking, moral hazard and adverse selection. These *non-market failures* or *agency*

problems will be treated in the first section of the theoretical part of the paper.

3.2 The lack of a consistent National Water Policy: lack of financial and human resources, lack of political will or a case of non-market failure?

The most important water user within the Macedonian water economy sector is the agricultural sector. This is true for most other countries and particularly for most of the developing countries in the tropics and sub-tropics where the issue of water shortage is closely related to the issue of redistribution of water from the agricultural to other sectors. Estimates for 1996 show that the irrigation sector used about 62% of the total demand of 1.846 mill. m³ water with an additional 11% going to fish ponds. Industrial use of different kinds accounts for 14.8% and the municipal water supply for 11.6% of total water demand (ICID, 1999)⁹. As in many other countries, official documents do not point out acute shortages of water for the time being. Considering spatial distribution and seasonal patterns, however, there are indeed indications of water shortages in most municipalities and of declining water levels of lakes. Conflicts over water are thus not impossible in the medium and long run, within the country as well as with neighbours as most lakes serving as natural water reserves are shared with neighbouring countries¹⁰.

The shortages observed are bound to become more acute in the years to come because of an increasing demand in most sectors of the economy. The demand for ecological uses and for tourism is becoming a new concern, particularly in view of European integration where ecology and bio-diversity related issues are high on the agenda. Also tourism has a high potential for Macedonia once the region will be back to normality. As the structural transition of it's economy will soon be showing an impact in terms of growing production and incomes also the traditional uses such as drinking water, agriculture and industry will show an increasing demand. Last not least, not just water quantity but particularly water quality will be a limiting factor and thus an important issue in national water policy in the near future¹¹.

Though still not well articulated and officially acknowledged in a national water policy document, there are concerns about water shortages and environmental problems in documents translated into English, e.g. in the 'National Vision Water for Food and Rural Development 2025' (ICID, 1999) and in the 'Study on water resources development and management master plan' (JICA, 1999) quoted before. These documents, however, lack official recognition and wider distribution, as well as analytical depth and policy orientation. The efforts by the GTZ 'umbrella' project¹² to foster the elaboration of a Water Master Plan in a comprehensive participatory and policy-oriented process involving the public, semi-public entities, which have been assigned specific tasks by the NWL have been delayed. It is not quite clear, which factors have blocked these efforts most: the change in government, the lack of human, physical and financial resources within the Ministry of Agriculture, Forestry and Water Economy (MAFWE) and within the water economy sector, the interests of stakeholders not interested in transparency and clearly spelt out rules of the game, or the lack of political will. The latter term, of course, is an empty slogan often heard and usually blurring the vision for more profound reasons like e.g. the weak social capital indicated by a

reduced co-operation capability in the society. In the discussions concerning a new water fee system it is unclear and doubtful, if the MAFWE has the capacity and political standing to function as a regulatory and policy design and implementation agency - a role assigned to it by the NWL.

3.3 The precarious situation of irrigation agriculture: temporary or permanent, external or internal incentive problems?

Macedonia has about 665.000 hectares of arable agricultural land. Of these about 400.000 have a potential for irrigation, 123.100 have been developed for irrigation in the past, but only 36.146 have been irrigated in 1999¹³. The main reason for this extreme case of under-use of a valuable resource can be explained by the above mentioned vicious cycle in which WMOs and irrigation farmers are caught. The 'mounting accounts receivable of questionable value' mentioned in a recent financial review of four WMOs certainly refer mostly to unpaid irrigation service fees¹⁴. The recovery rates of 88% reported for 1990 have come down to 35% in 1995. Vacant land and low recovery rates are an indicator for marginal costs (high, because of rising water fees for increasingly unreliable water delivery and because of high costs for productivity enhancing inputs) surpassing marginal value product (low, because of low prices and low yields due to the unreliable supply of water and other inputs), making it uneconomical for farmers to produce for the market. The return to subsistence farming constitutes a rational reaction to the high risk and low productivity situation of irrigation agriculture in Macedonia.

The contraction in terms of irrigation area is in line with a general trend in the agricultural sector, where increasing costs for inputs and decreasing prices for the output led to a squeeze in productivity, in profit margins and incomes with a general contraction of the sector as a consequence. In terms of population dependent on agriculture the importance of the sector has been decreasing, from 72% after World War II to 12% in the 1990s. In terms of the trade balance the receipts of exports covered imports only by about two thirds on average but there were extreme variations from 7 to 17% between 1990 and 1995, mainly due to the unstable political and economic situation. Also with respect to property rights in land the transition to private property is not settled yet. Of the total cultivated land, 70% belongs to private farms (about 177.000 ha with an average size of 2.6 ha according to a World Bank study of 1997), about half of the farming population having less than one hectare per family. This means that agriculture is a part time activity for most of the rural families, with parts of family income earned in other occupations inside (as agricultural labourers) and outside the agricultural sector. The 'agrikombinats'¹⁵, cultivating about 20% of arable and about 37% of irrigated land, are still considered a dynamic factor, an important employer and a powerful stakeholder in rural areas. They are also a particularly relevant but little known force in the efforts to restructure WMOs, to organise water user participation and to design a legal status for water communities which enables them to take over tasks in the operation and maintenance of secondary and tertiary irrigation systems.

Besides the missing legal framework, the small size of private holdings, the small

and dispersed plots and the large number of part-time absentee farmers partly explain the low organisational level of water users and must be seen as the principal structural impediment for solving the acute problems of irrigation agriculture through an increased water user responsibility and the control of WMO from below. In the case of four WMO studied in 1996 two thirds of the 26,456 private water users were part-time farmers, some living in cities and keeping land only as a tradition or for security reasons in case of critical economic circumstances. With some ethnic heterogeneity added to this, it may be easily understood that the standard solution of passing responsibility for operation and maintenance to water user associations prescribed by donors and based on theoretical reasoning and experience in other parts of the world¹⁶ in this case seems to be extremely difficult to realise. Client and service orientation of water related services, transparency of water pricing and accountability of WMO to user organisations seem to be theoretical concepts far removed from the reality of Macedonia, where informal institutions in terms of customs, in terms of mental constructs and individual policy models, and in terms of rules of conduct between water users specific to traditions in the Balkan region prevail.

Given this situation, the fact that policy makers opted for a hierarchical, top down solution to organisation in the NWL might appear in a different light. Up to now, however, this particular approach has not led to a more effective and efficient supply of services to water users. There has been little outside support to most WMO and to the PWEE in terms of training in modern management methods and in terms of providing modern cost accounting software and information technology. So, perhaps, it is still too early to allow a judgement on this approach. On the other hand, as has been pointed out earlier and will be further explained in section four of this paper, even these inputs cannot be a substitute for a sound institutional incentive structure giving water users more control over service provision and financing. It remains to be seen if the standard model of irrigation management transfer, to which the efforts of the World Bank financed *Irrigation Restructuring and Rehabilitation Project (IRRP)*¹⁷ are attuned to in four pilot schemes, will achieve some positive results. The current efforts to give a new legal status to the organisations in the water economy sector is an indicator for the trial-and-error hypothesis of institutional change and will hopefully be able to consider the rules for efficient provision and financing of irrigation projects outlined in section 4.3 of this paper.

3.4 Financing water related goods and services: royalties or levies, service fees or taxes, subsidies or cross-subsidisation?

The NWL unfortunately uses the term water fee indiscriminately for all kinds of payments, from royalties or levies for the use of a natural resource, to service fees, to taxes and other charges. According to article 132 of the NWL eight different water payments are to be collected, some of them related, some not related to the demand for and the costs of providing water related services within the water economy sector. This lack of specificity and consistency of financing instruments will not only confuse communication between stakeholders in the

discussions on the provisions of the law, it also goes against established rules of public finance. And more dramatically, it does not allow transparency and accountability i.e. it does not allow a clear assessment of who is paying how much for what reason, purpose or service. In terms of public finance theory, the *principle of fiscal equivalence* is not respected, meaning that the gains someone draws from public services should – more or less – correspond to her or his payments in form of fees (in case of services received) or taxes (in case of benefits from public goods). Taking as an example the *Public Water Fund* (PWF) to be created according to article 122 of the NWL, an individual person may pay in three ways to this fund. Firstly, in terms of a deduction from his or her wage (0.2% water tax); secondly, in terms of the payment of a service charge for drinking water; thirdly, through the payment of general taxes (Sander, 1997). The possible incentive or disincentive effects from such a conglomerate of different kinds of payments are hardly to be assessed.

The lack of fiscal consistency and transparency to water users resulting from these provisions of the NWL has additional drawbacks. It does not promote trust and willingness to pay, neither on the side of water users nor by other contributors to the PWF. On the other hand, there is no transparency and patterns of accountability inherent in the legal provisions to guarantee that the right incentives for an effective and efficient collection and use of funds will be set. In terms of information theory to be explained in section 4.1.2.2 of this paper, adverse selection, moral hazard and, more generally, agency problems and rent-seeking are bound to occur. Last not least – the legal provisions do not create trust. The principles of equity and justice for which water users as well as the general public is increasingly sensitive, not only in Macedonia but in all transformation countries and in the western market economies, are not easily integrated into a system of water fees, in particular in a centralised one. The tradition of funding lumpy infrastructure from general tax money and letting public enterprises take care of its operation and maintenance without users paying at least variable costs, is common in the irrigation sector of developing but also in industrial and transition countries. Though cross-subsidisation within public utility companies and subsidies for transport and other public services is still common practice, recently more and more of these services are being privatised. This process is not very popular with stakeholders as it means a loss of rents to users of the subsidised services and a loss of income or fringe benefits to employees and board members. Users, on the other hand, are risk-averse and lack experience in taking on the tasks of monitoring and control of services or organising the services themselves. However, by reducing or curtailing the disjunction between payers, providers, and receivers of water related services, a main source of non-market failure, will almost certainly lead to an increase in efficiency and effectiveness of services. The concepts presented in the following sections should give some insights into underlying problems and design principles.

4 An institutional approach to water pricing - some theoretical concepts

4.1 Institutional imperfections and failures

Just as service fees should be distinguished from royalties or taxes, a water fee should generally be distinguished from a water price, even though the terms 'water price' and 'water fee' are often used as synonyms. This, however, is not quite correct, as pricing usually relates to markets¹⁸. Here we use the term water price to refer to markets as well as to other non-market institutional configurations or governance modes for providing and financing water and water related goods and services. As mentioned earlier, our basic proposition in this paper is, that the search for appropriate institutional configurations setting incentives for socially beneficial behaviour by the different stakeholders must be seen as an iterative (trial and error), path dependent process in which imperfections and failures of institutions, transaction costs and strategic behaviour of stakeholders are the subject of the analysis and part of the process at the same time. It is therefore necessary, that a constant monitoring of this process of guided institutional transformation within the water economy sector takes place. The responsible authority¹⁹ and the commission charged with the elaboration of the water fee system need assistance from an appropriate research institute²⁰ in order to have some continuity and permanent conceptual input. The following sections will give some elements for such a conceptual input.

4.1.1 Market failure and the narrow perspective of neo-classical economics concentrating on price incentives

Economists consider *competitive markets* as the most efficient form of co-ordinating individual decisions concerning the production, consumption and exchange of goods and services in an economy. As markets link the costs of producing a good (supply) to the income sustaining it (demand), given a particular resource base – *markets* and *prices* are considered to efficiently provide information and thus the right incentives for individual decision making, i.e. decisions leading to the clearing of markets by bringing supply and demand into a socially optimal (fictitious) equilibrium. Competitive markets eliminate inefficient suppliers, market prices providing, in addition, a straightforward way to estimate the (scarcity) *value* of a good or service if certain basic requirements are fulfilled.

Efficiency is a central term used by economists as yardstick to assess economic activities and processes as well as outcomes and institutions. The term generally refers to the cost-minimising or profit-maximising provision of a good or service, allocation of resources, or functioning of an institutional arrangement. The exchange of goods and services and the allocation of resources within a market economy are considered efficient, whenever in a (fictitious) equilibrium situation nobody can be made better off without anybody else being made worse off²¹. Thus, competitive markets, by eliminating inefficient providers are considered the driving force in an economy leading to efficient outcomes²² as the prices in these markets give the right incentives to economic agents – to producers and consumers as well as to traders and service providers. 'Right' in this case means

prices reflecting the real costs or benefits of the goods and services to society. In case of the deviations of actual (financial) prices from socially optimal ones, economists talk of 'market failure' requiring direct regulation and policy interventions. In the economic assessment of policies and projects, adjustments of prices will be necessary whenever actual prices do not correspond to socially optimal ones, if markets are distorted²³.

Within the water economy sector, a range of market failures are possible and we will distinguish four types, though only the first two are generally considered as such in mainstream economics. The *first*, the *public good type market failure* refers to a situation, where a good or service will not be provided in a socially optimal way by private initiative through markets; either not at all, or not efficiently or not sufficiently. The reasons might be (i) a market does not come about because of the particular *intrinsic properties* of a good, e.g. in case the exclusion of non-paying users is not possible (*free rider* problem), (ii) markets do not provide enough of the good or service in terms of a social optimum because not all the positive effects are compensated for by the market price, private providers thus making a loss (*positive externalities*); (iii) the provision of a good or service requires an investment which is very *risky*, which is subject to *increasing returns to scale* (decreasing average costs), which is very specific for a particular purpose, very costly or has a long gestation period (infrastructure and *lumpy investments*). Once the investment has been done in these cases, it is very difficult for a competitor to offer corresponding goods or services. This '*natural monopoly*' case applies to many lumpy infrastructure investments in the water economy sector²⁴. It should be noted, however, that a public good type of market failure does not necessarily mean, that the good has to be 'publicly' provided, particularly not by the central government. As will be discussed later in this paper, it might just as well be provided by local governments, by an organisation of civil society or by collective action²⁵.

The *second type* of market failure refers to the well known case of external costs (*negative externalities*), i.e. costs not reflected in the market price. This underpricing or non-pricing of a good or resource (or a particular feature of it) leads to a consumption or use pattern not corresponding to a social optimum. Environmental degradation or pollution and the exploitation of a natural resource beyond a sustainable level are cases in point (in the water sector the deterioration of water quality, soil degradation because of salinity and water logging, overuse of fossil groundwater are cases in point). Providing efficient formal institutions usually is a case of a pure public good. However, rules concerning the use, the management and the fees for its use might not necessarily need to be provided by the *central* government. Local governments, civil society organisations and collective action at some other level might have more adequate solutions. The pricing of services, the distribution of water delivered in bulk, the management of a local watershed, a forest or a communal pasture are examples where decentralised options need to be considered.

The *third and fourth types of market failure* usually are not subject of concern in mainstream economics. Generally concerned with allocation and economic efficiency issues, questions of equity and distribution of income and property rights

being taken care of by assumptions²⁶. Also in neo-classical welfare economics, the conceptual base for a SCBA, the distribution of property rights is assumed to be optimal, winners are assumed to compensate losers. A policy or project is taken as socially efficient ('pareto optimal') if winners are better off with the project and policy than without it, even after compensating losers. As this compensation is only taken care of by assumptions but is rarely done in the implementation phase of a project, non-sustainable outcomes are so frequent. Projects concerning a change in the use of a natural resource, the provision of a lumpy infrastructure or the change in water distribution, compensation will need to be considered right from the beginning in a participatory planning and implementation process. Some enforcement by a higher authority sometimes will be needed if the more ambitious goal of social efficiency (compared with economic efficiency) is to be attained. Poverty and equity problems are thus cases of market failure in this wider sense of efficiency. Special institutional provisions for their alleviation, on the other hand, are bound to be haunted by non-market failures to be explained in section 4.1.2.1.

The *fourth type of market failure*, due to imperfect or asymmetric distribution of information and to costs of transacting in markets and non-market institutions, is generally not considered as market failure in mainstream economics. Institutional economists, on the other hand, have focused particularly on these problems. They arise in markets as well as in non-markets and can therefore be considered as market as well as non-market failures, depending on the type of problem we are looking at. Thus the so-called *agency problems* arising because of asymmetric distribution of information, can be observed in market as well as non-market institutions or organisations. In the case of the Macedonian water economy sector it is a subject of interest and will be treated in section 4.1.2.2.

4.1.2 Non-market failures and non-price incentives - an extended institutional perspective

The term *non-market failures* is less used, even though the corresponding phenomena are well known - from developing and developed countries as well as from centrally planned and from market economies. The first type concerns political bodies, state bureaucracies, public and semi-public enterprises as well as non-governmental organisations (NGOs) such as non-profit research and development organisations, foundations, charities, political and grass-roots organisations. A common feature of these organisations is that funds for sustaining their activities are not earned in the market or are partly not earned in the market, other sources being taxes, transfer payments from the government (subsidies), member fees, donations, charity. In all these cases, there is no built-in mechanism (market competition) to eliminate organisations which cannot cope properly with the second type of non-market failures as well as with other sources of inefficiency, ineffectiveness, and redundancies. This first type which has been particularly studied by sociologists and political scientists will be treated in the following section, the second type, a domain of institutional economists, thereafter.

4.1.2.1 Non-price incentives and disjunction between costs and revenues in the public and non-profit sector

In the case of a water economy sector, politicians and decision-makers in public and semi-public entities involved in regulating the provision and financing of water and water related goods and services deal with a natural resource belonging to the state (water) and with financial resources provided mainly by tax-payers and by international finance institutions, the latter generally through loans under very soft conditions. Handling these resources means power, influence, reputation. Besides the incomes earned, there might be rents involved, sometimes even payments beyond the line of legality. Any changes taking place in the existing system of regulating access to water, to tax money or aid will mean an impact on these incentive relevant items or, at least an impact on stakeholder perceptions of the changes in these items concerning their particular stakes, i.e. their expected gains and losses. Thus, even in the case of the introduction of a new water fee system there might be stakeholders who might try to block or promote specific instruments for funding irrigation infrastructure or water pricing (see e.g., Repetto, 1988).

Lobbying, rent-seeking, or corruption are some phenomena relating to this first type of non-market failure due to *self serving behavioural patterns* of politicians and bureaucrats. Features of neo-classical theory have been applied to the analysis of the behaviour of government bureaucracies and political institutions and the people working therein by political scientists of the Public Choice and New Political Economy (NPE) schools of thought. The subject of analysis is the individual motivational structure in the political realm, with methodological individualism, individual preferences and utility maximising of political actors being elements corresponding to neo-classical economic theory²⁷. Voices have been raised, however, against oversimplified policy conclusions from these theories. Their 'profoundly cynical view of the state in developing countries' (TOYE) has been criticised as well as the corresponding bias of neo-liberal policies towards market-orientation, state-minimalism and privatisation of natural resources promoted by international development finance institutions ('Washington Consensus')²⁸.

Another source of non-market failure has been related to the disjunction between costs and revenues in non-market organisations, i.e. organisations which do not sustain themselves by selling goods and services in the market, and pointed out as the main source of non-market failure in government agencies by WOLF (1988). "The predominant and ineluctable source of non-market failure lies precisely in those circumstances that provide the rationale for non-market activity in the first place" (Wolf, 1988: 63). WOLF sees the lack of a mechanism to eliminate inefficient and ineffective providers comparable to the competition and price mechanism in the market as a source of redundant and rising costs inherent in public as well as other non-market organisations and describes internalities and organisational goals as well as derived externalities as sources of non-market failures, with power and privilege leading to distributional inequities²⁹.

These sources of non-market failure also prevail in non-governmental, non-profit

or charity organisations (NGOs). International development finance institutions working with NGOs as intermediaries between the state and local organisations and as providers of goods and services to beneficiaries of aid have become aware of this. They have introduced institutional mechanisms to eliminate, at least periodically, the least effective NGOs. The tendering of service contracts which has been done for many years in the case of private consulting firms on a large scale is now applied to contracts with locally working NGOs earning most of their income in the market. By this institutional mechanism, the beneficial forces of markets are introduced into development aid, a sector particularly prone to non-market failure.

4.1.2.2 Asymmetric distribution of information and transaction costs – non-market failures within public, non-governmental as well as private organisations

Since COASE and WILLIAMSON have first pointed out the importance of transaction cost and agency-problems due to asymmetries in the distribution of information with the corresponding problems of shirking, moral hazard, and adverse selection, the studies on these topics have become innumerable and concern all sectors and types of organisations and institutions, private as well as public, market as well as non-market. Based on neo-classical economic theory new institutional economists are looking at incentive and selection problems in a wide range of market–non-market institutional configurations and thus bridge the gap between the market and the non-market. Though still not coming up with much quantitative material on transaction costs or straightforward rules for the design or reform of institutions in the market–non-market range, they point – among others - to the importance of principal-agent relationships, to strategic behaviour of economic agents, to non-price incentives, to the relative costs of creating and transacting in institutions, and to the general importance of information, of transparency, and accountability³⁰. The concepts cannot be discussed here in more detail, but they are certainly relevant in the reforms of the Macedonian water economy sector and in the design of a new water fee system. Taking up the subject of principal-agent relationships, there are several ones to be considered when analysing stakeholders in the water economy sector, particularly the relationship

- between the electorate and the Government,
- between the Government, represented by the Ministry of Agriculture, Forestry and Water Economy (MAFWE), and the PWEE,
- between the PWEE and the WMO³¹, and
- between the WMO and the water users.

In the last case, however, the perspective should be turned around, considering the farmers and water user organisations as the principal and the WMOs as the agents. And an incentive system needs to be designed which makes WMOs respond more to the needs of the clients – the farmers in the case of the agricultural sector, the energy sector, the different crafts and industries and, last not least, the consumers. The latter consider high quality drinking water as a

central basic need. Rivers and lakes are an impressive scenery, a habitat for biodiversity and a source of recreation for locals as well as tourists from other regions and countries – all uses which compete with irrigation agriculture. Important steps towards a client-oriented approach to water resources management will be the identification and involvement of the different stakeholders and the identification and further specifications of the different types of goods and services involved, their intrinsic properties and the specific supply (costs) and demand (willingness and ability to pay) conditions.

4.2 Intrinsic properties, supply and demand conditions of resources goods and services

In the case of water and water related goods and services we are faced with a variety of goods or features of goods which will determine the institutional configurations for their effective, efficient and sustainable provision and financing. In a first step we will therefore look at the intrinsic properties of goods and resources as determinants of the way a natural resource might be managed or provided - by a public agency, by the market, by some communal or collective effort or in a mixed configuration. In a second step we will see how water and water related goods and services can be analysed in terms of the supply and the demand conditions.

4.2.1 Private, public and mixed goods

In the literature, several approaches for categorising goods from an institutional perspective are known. A first approach distinguishes two intrinsic properties of goods³², namely *excludability* and *rivalry in use* (sometimes called *subtractibility*) allowing the identification of four principal types of goods in a 2 x 2 matrix³³: private goods, public or meritory goods and mixed goods, the latter subdivided into the categories of club and collective (or common pool) goods. The intrinsic properties give indications as to the type of institutional set-up needed for the provision, financing and management, *rivalry* meaning two users cannot use the good or resource without affecting each other's utility, *excludability* referring to the exclusion of *free riders* i.e. any users not willing to pay the market price or a user fee.

Looking at the institutional configuration for the management or provision in each case there is, *firstly*, the most common case of well specified *private goods* to be provided by the market. The technical and/or institutional properties of excludability (by the market price) and rivalry in use (the good cannot be consumed twice or without affecting the utility of another consumer) are both given. There is, *secondly*, the well known group of *pure public goods*. They are *non-rival* in use and exclusion of *free riders* is technically not possible or socially and economically not feasible. For some pure public goods, often called *meritory goods*, provision by a public sector institution or a government agency is considered necessary. In the case of natural resources management, introducing formal property rights to water or land or formal regulations for the trading of water

rights and land (i.e. for markets) are meritory goods.

Many goods and services formerly provided by public entities might be reassessed from time to time as either the intrinsic property of non-rival use or the technical, economical or social feasibility of exclusion might have changed over time. In the case of the management of natural resources and the provision of water and water related goods and services, goods formerly taken as meritory, nowadays are rather considered *mixed goods*. There is often scope for technical or institutional interventions to exclude non-payers and for differently organising the management and provision, e.g. collective action by the users or tendering and private bidding for service contracts. The options, however, are different for *club or toll goods* and for *common pool goods or resources*. The first still have the properties of non-rival use, but the possibility for excluding free riders is given, either by institutional or by technical measures or both. In the case of *common pool goods or resources* (CPR), rival use is given and collective action of users for designing management rules to cope with degradation problems of some natural range or forest land is possible. In the case of irrigation, collective action for providing a small ('non-lumpy') infrastructure, for operating and maintaining a water distribution system and for financing these activities are options to be considered.

Thus, in situations where the indicated properties of mixed goods are given or likely to be given, *the public good market failure argument* as a reason for public intervention or provision needs to be carefully assessed. In many cases a closer look at the specific situation will allow to discriminate between different goods involved or perhaps different properties of one specific good or resource, each with a different potential institutional configuration. Examples have been described where services or tasks formerly seen as non-separable (like e.g. an up-stream large infrastructure and the down-stream distribution system in irrigation) have actually been identified as separable, partly to be managed by collective action, partly to be provided by the public or private sector. With each institutional configuration the specific efficiency and effectiveness enhancing properties of institutions can be aligned with the corresponding specific intrinsic properties of goods, services or resources³⁴.

Girishankar & De Silva (1998) looking at goods and services from the perspective of strategic management in the public sector distinguish the two intrinsic properties of *specificity* and *contestability* of goods and services usually supplied by the public sector. They propose markets and mixed-good modes of governance in which the state only intervenes with some regulatory measures. High specificity (i.e. possibility for specifying an output with precision) and high contestability (i.e. absence of barriers to entry of alternative providers) are the properties allowing non-public provision. In the case of the operation and maintenance of a major infrastructure, for instance, competitive tendering every so many years allows the redefinition of a service contract, considering changing productivity, technologies, redundancies and rising costs³⁵. For other tasks like the creation and protection of formalised property rights to water and irrigated land and for the specification and monitoring of policies there is a need for public bodies to take action. In the case of Macedonia, the introduction of a sector wide system of charges for the use of

water, a natural resource owned by the state, a system to control the efficiency and effectiveness of service provision to farmers and other water users would be necessary if the government fails to delegate this function to water users in a redefined legal and institutional framework. For the time being the MAFWE, a public body within the water economy sector has initiated and has been supervising the elaboration of a centralised system. In section 5 some conclusions will be drawn concerning the particular situation of Macedonia.

4.2.2 Supply and demand aspects of water and water related goods and services

A market for water has not yet been considered in Macedonia, the different features of water related goods and services may be discussed in a supply and demand framework, even without having formal markets for the time being. Thus, consideration of location and time specific scarcities might be better understood. Average and marginal costs concern the supply of water, in the short as well as the medium and long run. Information on the willingness and ability to pay for water in the different sectors will allow to approximate a demand schedule for water. For both, the supply and the demand side, the corresponding data need to be collected in order to be able to assess, qualitatively and quantitatively, the options for institutional set-ups for the provision and financing of the following water related goods and services:

- water as a *renewable natural resource*, available cost free to society and humanity, originally abundant and of good quality, but subject to site and time specific scarcities and quality differences, due either to natural or to human factors or interference (often public good and externality type market failures),
- *water related infrastructure*, e.g. source structures, infrastructure for pumping, diversion, adduction, storage, distribution (often, but not necessarily, public good type market failures in case of 'lumpy investments', free riders, positive externalities, or natural monopoly),
- *water related services*, e.g. providing and cleaning water, disposing of waste water, operating and maintaining infrastructure (mostly market provision possible, market surrogates or collective action),
- *water related regulatory tasks* for securing the public interest, the interests of future generations or of humanity, e.g. regulating the water regime, restricting, granting and enforcing property and user rights, resolving conflicts, within a country or internationally (public good type market failures, meritory goods).

A comparative analysis of financing instruments (taxes, water charges and service fees) and of technical and institutional measures to exclude or castigate non-payers will need to consider the specific properties indicated and the interrelationships between the different types of goods. On the *supply side*, the costs of the different activities and structures for the protection and development

of sources of water, for repairing, operating and maintaining corresponding infrastructure will be the point of departure. These costs, which will widely differ between systems, need to be covered, respectively financed and recovered by appropriate financing mechanisms. Marginal costs for providing additional quantities will indicate the scope for efficiency-pricing and for supply side policies. As we are dealing with natural monopolies in a variety of different natural set-ups, different historical background, different designs and state of infrastructure with corresponding differences in the various types of costs, this is certainly not a straightforward affair. Subsidies for fixed and perhaps even variable costs and cross-subsidisation between users, uses and locations might need to be considered.

On the *demand side*, the various prevailing demand conditions of water and water related goods need to be assessed, considering ability and willingness to pay for different uses, users, sectors, and locations as well as incentive and disincentive effects of particular policy instruments to influence user behaviour and demand respectively. In a first assessment, the following types of demand conditions can be distinguished:

- a *direct demand* from consumers for the purpose of recreation, tourism, and drinking; the latter a basic need and thus to be distinguished from the former,
- a *derived demand* from producers as a central input in irrigated crop production and as an input in industrial production³⁶,
- a *derived demand* from industry for cooling purposes and as a sink for wastes in different industries, and, finally,
- a *derived demand* from the energy sector for the generation of electric energy and as a means of transport.

The prevailing demand conditions will be a determinant of the methodology for assessing the value of resources, goods and services (market or non-market valuation) as well as for the estimation of socially acceptable and justified service fees or charges (willingness to pay derived from market demand or directly assessed ability to pay), and for the generation of financial means to cover costs.

Whatever the specific features of the new water fee system in Macedonia might be, with centralised or decentralised determination and negotiation on the level of water fees, subsidies and other financial instruments, both supply side and demand side aspects will have to be considered. Specific regulatory provisions to avoid distortions in the price and non-price incentive structure, to prevent misallocations of resources as well as socially unacceptable outcomes will be needed. Central regulatory procedures by a central agency as well as negotiations on the regional or local level between WMOs as service providers and Water communities as well as water users from other sectors will have to be based on a coherent cost accounting system. Even a decentralised solution would benefit from a unique computer software for all WMO as well as water communities. This would enhance transparency, facilitate exchange of data and help in the design, implementation and monitoring of policies setting incentives to promote efficiency

and effectiveness through technical and organisational innovations by the WMO and Water communities. The current activities within the GTZ- 'umbrella' project, supporting the elaboration of a corresponding data base and cost accounting system would benefit from a clarification of the pending questions related to the issues discussed in this and the subsequent section.

4.3 Institutions for providing, financing, operating and maintaining irrigation infrastructure

As has been pointed out before, the provision and financing of water related goods and services are two separate but closely related issues. The previous analysis suggests that in many cases the provision and the sources of financing might not be directly connected, i.e. the receiver of a good or service might not be the payer. The multiplicity of types of goods and the different demand conditions prevailing as well as the different forms of provision (market, non-market and mixed) makes the question of financing a particularly complex one. In the case of a private good with market provision, the provider will cover his or her costs and profits from the prices charged to the buyer of a good or service. Here, the problems of the disjunction type of non-market failure indicated above will not occur. In other cases, however, e.g. in the case of a pure public or meritory good, financing from other sources like levies, royalties or taxes might be combined with some service fee component. Thus, often a mixed financing arrangement might be found to be the most appropriate institutional configuration. General criteria for the choice of a financing arrangement are economic efficiency, effectiveness and accountability to a public or semi-public entity and to users. Equity and the necessity of covering costs are further ones which will guarantee social acceptance and financial viability, both a precondition for the sustainability of any institutional set-up. Some of these criteria are more difficult to assess than others. The normative assessment in the following section, based on an analytic exercise under a limited efficiency perspective, though theoretically derived should intuitively appeal to practitioners experienced in the design and implementation of irrigation projects in developing and transition countries.

4.3.1 Rules for providing and financing irrigation projects

Looking from a social market economy (ordo-liberal) and economic efficiency perspective, Hatzius & Margraf (1994 a) derive normative rules for institutional choice and apply them to irrigation projects in Peru. These rules are considered a precondition for sustainable project outcomes. Reference is made to two basic principles. Firstly, the *subsidiarity principle* originating in catholic social theory. This principle states that a higher organisational unit should only take over a specific task if this task asks "too much" of the subordinate unit. The second principle is known from the theory of public finance and is called *principle of fiscal equivalence*. In the paper quoted, two rules are derived analytically. The first rule comes in two versions, 1a and 1b. Rule 1a concerns the case of a predetermined size of a group of water users benefiting from an irrigation project. In the case of rule 1b the size of the group of water users benefiting from an investment is not

predetermined by some natural, technical or social factor. As the question of size of irrigation systems has an influence on the complexity of its operation and maintenance, on the willingness of water users to participate in O&M activities (operation & maintenance), and on the ability and willingness to pay, version 1b of the rule is a particularly relevant one in development projects.

The two versions of the first rule are as follows:

- The users of a good should pay for the provision of the good and only the users (= payers) should be given the right to decide on the provision of the good. (1a),
- The range of people using the good provided by the project has to be restricted taking into account that the exclusion technique to be applied is, from an economic point of view, useful (1b). In addition, apply rule 1a.

The usefulness of an exclusion technique needs to be evaluated in terms of its economic costs and gains, the latter consisting of the avoided cost of overstocking, overcrowding and/or the avoided rationalising fees which would incur or would have to be charged if the range of users were not restricted³⁷. The second rule, the 'realised financing rule' - again only under economic efficiency considerations - states:

- Every user has to make a payment equalling the economic marginal user costs. If these payments are not sufficient, additional lump sum charges have to be implemented.

Even though the rules are derived under the very restrictive assumptions of neo-classical welfare economics discussed earlier, they point to some important aspects to be considered when investing in some irrigation or other infrastructure with properties of a mixed good. Once recognising the difference between pure public goods and mixed goods the next step in an institutional approach to water resource development will be to assist irrigation agencies and water user groups with institutional development measures, helping them to organise the provision and financing of water related services. The ex-post analysis of irrigation projects in Peru shows, that the rules were more or less respected in the case of small projects in the Andean mountains, ignored, however, in the case of a large coastal project³⁸.

The insights for Macedonia might be resumed as follows: (i) Users should be involved in the financing and decision making on investments and O&M services in irrigation, (ii) exclusion, i.e. restricting the number of users and payers, should be considered for economic efficiency considerations whenever it is socially accepted and whenever the economic gains of an exclusion technique exceed the costs, (iii) marginal cost pricing oriented in the 'economic marginal user costs' is recommended. This holds true both for a private good or service with market provision as well as the collective provision. If subsidies by the state or from other sources (e.g. water fund) are necessary during a transition phase and if users are asked to make any further payments because the amount collected based on economic marginal user costs are not sufficient, for allocation efficiency reasons the former should be made as an ex-ante specified lump sum payment, the latter

by some mutually agreed exceptional payment.

Institutional configurations or governance modes for supplying operation and maintenance services have to take into consideration the state and complexity of the adduction, storage and distribution systems (primary, secondary, tertiary) involved. The GTZ sector project "Maintenance Strategies in Irrigation" has provided a series of interesting studies, some case studies of different countries, others conceptual papers which contribute valuable insights to the discussion on institutional reform. The one being of particular relevance to the subject matter, the difference between a good and a service and how these differences affect the institutional configuration of governance modes for O&M services in irrigation shall be briefly introduced here.

4.3.2 Governance modes for O&M services in irrigation

In their analysis of service provision with case studies from irrigation projects in Peru and Bolivia, Huppert & Urban (1998) point to the particular need of interaction between provider and customer in the case of services as opposed to goods. In a goods-services-continuum they classify various irrigation related services in development co-operation projects as more product or more process oriented. In an instructive graphical analysis a mixed market non-market composite governance mode is presented in which stakeholders involved in the provision of a service are related in an open network. Here, service fees do not necessarily cover all the costs involved in a service but are supplemented by other sources, e.g. subsidies based on other charges such as taxes or royalties.

Though concerned with the operation and maintenance of irrigation infrastructure only, the methodology can be easily extended from a composite public utility governance mode to a whole water economy sector as complex as the one in Macedonia, with lumpy investments like dams and hydro-electric plants being financed, operated and maintained by different agencies. The large systems might be financed by private or public entities and operated and maintained either by a public utility enterprise or by a specialised private enterprise under a periodically tendered, well specified service contract. The distribution systems of different quality and size might be either run under a service contract by a private enterprise, periodically subject to new tender arrangements, or - if users are able to create an institutionally and economically viable service organisation - under their own control. Thus, operation and maintenance of the secondary and tertiary distribution systems of a large irrigation project might be done by collective action with a communal or co-operative type of organisation to be defined while the primary distribution system and the large structures will be managed and maintained by some other qualified service organisation.

5 Current issues of institutional reform in the Macedonian water economy sector - some conclusions

The four main issues of institutional reform in the Macedonian water economy sector presented in the first part of this paper have been formulated as questions. Both, the first, applied part of the paper as well as the second, theoretical part have tried to relate the conceptual to the practical issues in the text. Thus, in this last, concluding section these issues will not be taken up again. This section will instead give some preliminary and tentative answers to the four questions asked. The first and the third question, related to the organisational set-up of the water economy and irrigation sectors will be treated together as well as the second and the fourth question, particularly related to national water policy. In both sections, special emphasis will be given to questions related to institutional issues of the new water fee system.

5.1 The organisational set-up of PWEE and WMO and the situation of irrigation agriculture

With respect to the first and third questions concerning the public water economy enterprise (PWEE), the regional water management organisations (WMO) and the tasks related to the irrigation sector, the recentralisation of management and control should only be a temporary one, to be given up as soon as possible. Both, the PWEE and WMO should consider themselves as service organisations, the former offering services to the government, to the WMO as well as other organisations or private firms demanding water related know-how in the market. The WMO on the other hand should offer services to water users - in particular to the farmers in the irrigation sector but also to the other sectors, such as communal water supply enterprises, to the providers of energy, to industry and tourism. In exceptional cases, the income generating activities not related to water or to tasks specified in the NWL might be economically justified - at least for the time being, where every source of cash income is welcome. In the medium and long, however, once water-related activities generate enough income and once markets will function in a sufficiently effective way, horizontal integration of water-related service activities with non-water related production and service activities doesn't seem to promise enough economies of scale and scope to justify such organisationally complex institutional set-ups.

With respect to the fees charged for services their calculation should be based on real total cost estimates for the different services, with estimates of general costs accruing at different cost centres and to different stakeholders. As both PWEE and WMO will perform tasks of public interest, some lump sum subsidies might need to be paid to them from public funds in addition to the receipts from water fees. These transfers should be clearly spelt out *ex-ante* and should be based on the data presently collected by WMO personnel in relation to the new water fee system. The variety in composition, technical specifications and year of construction as well as in book and actual use value and maintenance costs will require system-specific formulas for the calculation of water fees and their adjustment to changes in prices over time³⁹. Operational losses should not be

covered by *ex-post* subsidies. Cross-subsidisation at the local level, as it has been practised in the past, is only to be recommended for a transition phase until the financial situation of WMOs has been consolidated. The topic of sector wide cross-subsidisation will be treated in the next section.

The feasibility of water user associations (WUA) in Macedonia has been tested in four pilot areas by the World Bank financed Irrigation Restructuring and Rehabilitation Project (IRRP), supposedly with questionable results. The lack of farmer participation in the present organisational set-up is reflected in the lack of representation of farmers as water users in the governing or supervisory bodies of the WMO, the PWEE and the PWF. Also on the regional level, the agrikombinats still seem to dominate farmer and other organisations as well as the corresponding WMOs. There is hope that these problems might change with time, once privatisation has been completed and the general economic situation will improve - in the country and particularly in the agricultural sector. On the other hand, there are structural and cultural impediments to water user and farmer participation in Macedonia. The cultural ones are not easy to remedy. The structural ones, on the other hand, have been detected by an expert commission and recommendations have been given as to new legislation. Though the corresponding reports are not available yet, the goals are generally known. Legislation needs to allow water users to run their associations as service providers with a capacity to generate income and accumulate reserves. They need institutional development assistance to improve their ability to efficiently and effectively monitor service delivery by the WMO and to take over water delivery and maintenance services within the secondary and tertiary distribution systems, receiving water in bulk at certain points in the system. The data collection effort currently underway will give transparency as to the most appropriate point in the system for water users to take over water in bulk as well as management, operation and maintenance.

5.2 The national water policy and the financing of water related goods and services in the water economy sector

For the time being the elaboration of a new water fee system cannot be based on a consistent national water policy. The delays in the elaboration of the water master plan supported by the GTZ-umbrella project is an indicator for the lack of importance given to the issue of a national water policy and for deficient co-operation of the stakeholders involved. Furthermore, the commission charged with the elaboration of a new water fee system for the time being is only concentrating on irrigation, as this is the principal sub-sector of the water economy sector at the moment. Other sectors have been informed about the on-going activities, in particular the data collection. Up to now, however, there are no members from sectors other than agriculture, forestry and water economy working in the commission. As the questions of willingness and ability to pay for water fees and possible cross-subsidisation between groups of water users and sectors will be a central one, participation of other sectors is urgently needed, including the provision of data on the income and cost situation in specific sectors and sub-

sectors. This participation and provision of data, however, is a *conditio sine qua non*, at the latest once the present data collection concerning water storage, adduction and distribution infrastructure will be finished and the formulas for the distribution of costs to different sectors are to be conceived and discussed.

The delays in the data collection effort as well as in the elaboration of the water master plan seem only partly to be a problem of lack of political will and lack of resources. There are the above mentioned conceptual deficiencies in the NWL with respect to the organisational set-up of the PWEE and the WMO and the tasks assigned to them, i.e. the provision and financing of water related services. There are also deficiencies in the human capital available, quantitatively in terms of technicians and professionals, including economists. Qualitatively in terms of professional and managerial background as well as experience and training in methodology and in the use of strategic planning tools. The staffing of the PWEE and WMOs as well as of projects in the water economy sector, including the elaboration of the water master plan and of a national water policy, has posed serious problems. The reason is obvious: compared to the private sector, public sector jobs are not very attractive at this time of take-off in the Macedonian economy.

This brings us back to the issue of institution sequencing and timing. There is no doubt that institutions for the formation of human capital should have priority and, perhaps, should be the starting point for any successful development strategy. This has been pointed out time and again by development theoreticians. The optimism of the traditional approach to economic policy suggested by the idea of 'institution sequencing and timing', however, does not seem to be very realistic. The situation in Macedonia referred to in this paper is a case in point. The concepts of path dependency, market and non-market failure, discussed in this paper might help to understand, why institutional reform policies cannot follow any blue print approach and why it must be rather understood as a process of trial and error. The present reconsideration of the organisational set-up within the Macedonian water economy sector, particularly concerning the tasks and legal status of PWEE, WMOs and Water Communities, is an indicator for this. If this reconsideration will lead to taking back some of the recentralisation provisions of the NWL remains to be seen. From an institutional economics perspective and considering the experience in other countries, it can be considered as a step into the right direction.

Even though a transitory recentralisation might have been justified from a political economy perspective, the fact that such a step has proven to be not quite as easy to do as previously assumed suggests some reconsideration. Centralisation goes against the natural (independent water systems) and perhaps cultural and other properties of the sector and, particularly, against the general trend within western market economies. The experienced opposition to revenue centralisation and income redistribution between WMO as well as the dramatic decline in the recovery rate of water charges are convincing indicators in favour of a decentralised organisation. This empirical evidence is backed by the theoretical concepts of path dependency, non-market failure, asymmetric distribution of information and transaction costs discussed in this paper. Last not least, the

difficulties experienced in collection and processing of the necessary data for a centralised new water fee system as well as the complexity of the task of designing, implementing and monitoring such a system is also a strong indicator in favour of a more decentralised one. A decentralised system should, of course, also be based on improved data base and cost accounting systems with water user participation in the determination, implementation and monitoring of such systems and the periodical assessment and adjustment of water fees. For both approaches, co-ordinated support from national and donor institutions in the form of technical assistance, training, computer hardware and software will be needed.

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- ¹ Evaluation methodology in cases of ex-ante evaluation, however, often recommends non-consideration of these costs („sunk costs“)
- ² There are, of course, other factors working towards ever bigger and more expensive infrastructure, related to the rent-seeking phenomena to be discussed later-on in this paper.
- ³ Thus, in the determination of water user fees, the high initial investment costs lead to decreasing average costs and to the problem that marginal cost pricing, which is generally recommended for economic efficiency reasons, does not cover fixed cost. As marginal cost pricing in this case does not lead to full cost recovery, full cost recovery and subsidisation are critical issues in institutional design in the water economy sector and, more general, in natural monopolies, see Coase (1988).
- ⁴ See e.g. North (1992), Witt (1993), Brandes (1995), Eggertsson (1997).
- ⁵ The number is sometimes given as 26, probably due to some sub-units being considered as separate WMOs.
- ⁶ The principal tasks of the public water economy enterprise (PWEE) are „Construction, maintenance and utilisation of water management facilities dealing with provision of water for water supply, irrigation and drainage; protection zones; control of the harmful effect of water; protection of the riverbeds and riverbanks; flood control, erosion and torrent control; sand, gravel and rock dragging for the purpose of protecting and improving the water regime; provision of water reserves that will secure a unique water regime in a catchment area or a section of a catchment area and elaboration of project documentation and studies for improving the water regime“ PWEE (1999)
- ⁷ Debt-enforcement for outstanding water fees or loan repayment in Macedonia seems to be almost inoperative. WMOs have more than 40,000 cases awaiting decisions by the courts (Lee, 2000).
- ⁸ See e.g. Fukuyama (1995). Recently, T. RIPPERGER (1998) presented an excellent treatment of the subject from an institutional economics perspective.
- ⁹ According to another source (JICA, 1998) total water requirement – including a biological minimum requirement of 10% of average flow - in 1996 has been 2,416 (2,235) mill. m³/year, with a distribution of 9.02 (16,2) percent for municipal water, 56,04 (42,5) percent for agriculture, 4,72 (12,08) percent for industry and 30,22 (29,22) as biological minimum (alternative scenario in brackets).
- ¹⁰ A significant decline in the water level of the Prespa and Doyran Lakes has been reported for the last 15 years, see ICID (1999). Shortages of drinking water have been reported for most municipalities of the country and problems of pollution of rivers and lakes by untreated industrial and domestic wastewater have been identified for various locations, see JICA (1999) ‘Study on water resources development and management master plan in the former Yugoslav Republic of Macedonia’, Final Report Vol. I, Figure 6: Location Map showing Development needs and Environmental issues.

- ¹¹ There are considerable differences with respect to quality and quantity, time and space in the 10 different river or lake systems distinguished in JICA (1998), which cover a total catchment area of 25,713 km²
- ¹² ‘Beratung des Republikamtes für Wasserwirtschaft, Makedonien’ PN 95.0786.4, The ‘umbrella’ project supports, among other activities, institutional development in the Water Sector by providing short term consultants.
- ¹³ Unofficial information from the Ministry of Agriculture, Forestry and Water Economy (MAFWE).
- ¹⁴ In the first half of 1999 only 20% of the total income of the 24 branches came from paid irrigation service fees.
- ¹⁵ Large, vertically integrated publicly owned enterprises. At the time of independence they cultivated about 200,000 hectares of state owned land, the 50 largest 85% of this land. Just like the WMO, they have serious management and incentive problems and are left to struggle having lost privileges, like access to cheap ‘credit’. A study of the political economy of privatisation efforts of agrikombinats would probably reveal some interesting insights.
- ¹⁶ See e.g. the International Irrigation Management Institute (IIMI) Short Report Series on Locally Managed Irrigation.
- ¹⁷ A recent appraisal mission of the project might have come up with some new ideas how to cope with the problems. The corresponding report, however, has not been released yet.
- ¹⁸ Though a price might also be set in an auction or by a firm launching a product in a market, with adjustments then taking place according to the demand side.
- ¹⁹ At present MAFWE is charged with this. A thorough analysis of roles and capacities of public, semi-public and private organisations within the water sector has not been done up to now and cannot be done in this paper. It is, however, urgently needed in view of the design and implementation of the new water fee system.
- ²⁰ The *Water Development Institute* (WDI) seems to be the best developed quite independently managed candidate with (in 1998) a staff of 24, of which, however, 14 are engineers and only one is an economist.
- ²¹ This so-called PARETO-efficiency has been named after the economist who formalised the corresponding analysis of an economy. The concept has also been applied to the internal organisation of a Public Sector Agency, where the (i) identification of a core strategy, (ii) institutional arrangements between principals and agents, and (iii) process design and the organisation of work have been identified as the three layers of an efficient public sector agency, see Girishankar & De Silva (1998)
- ²² The supposed elimination of inefficient institutions, however, only applies under a range of assumptions inherent in the neo-classical model.
- ²³ Social Cost Benefit Analysis (SCBA) use shadow (economic or social) prices instead of actual (financial) market prices, either adjusted to account for market failures and distortions or derived from international prices.
- ²⁴ The implications for pricing in this case are not clear and have led to the so-called ‘marginal cost controversy’, see e.g. Coase (1988, reprint from 1946).
- ²⁵ The provision and reform of institutions in the water economy sector is a case of a public good type of market failure; see also section 4.2.
- ²⁶ Perhaps instead of market failure we should therefore be talking about *model failure* – the failure of the neo-classical model of an economy to capture important features policy makers are faced with in reality.
- ²⁷ In particular game theory is used to investigate strategic behaviour of optimising individuals.
- ²⁸ See e.g. Toye (1991) and (1993), Streeten et al. (1995), Baland & Platteau (1996).
- ²⁹ See Wolf (1988), particularly Chapter 4.
- ³⁰ See, e.g. Richter & Furubotn (1996), Erlei *et al.* (1999).
- ³¹ As long as there is no new management structure within the PWEE nor a clear distribution of responsibilities between managers on the central and local levels WMO managers do not take decisions unpopular with either their own local constituency or with the central office: no disciplinary measures nor reduction of personnel, no water cutting to non-paying water users, no incentives in forms of discounts for old debts to improve debt payment – all measures being discussed but never implemented.
- ³² The term good comprises also resources, services and institutions
- ³³ See HATZIUS (1999):279.
- ³⁴ See Weltbank (1994), Blankart (1994) and Keohane & Ostrom (1995).
- ³⁵ Here, competition does not take place in the market but for a market!
- ³⁶ The value of water might be derived from the willingness to pay for the final output of agricultural and industrial goods, see e.g. Hatzius & Margraf (1994) b for the valuation of irrigation water as a collectively used input to agricultural production.

³⁷ In terms of market failure, exclusion, if socially accepted, thus contributes to economic efficiency by minimising transaction costs and internalising externalities.

³⁸ A more recent assessment shows, that Peru's irrigation sector and particularly the large projects of the coast have benefited from a process of institutional reform in which water users have taken over many tasks formerly done by public entities, see HATZIUS (1998)

³⁹ Activities to determine these costs and to establish a data base and cost accounting system for this purpose are underway with support by the GTZ 'umbrella' project. Since this paper has been first conceived in the beginning of 2000, some changes in the organisational set-up might have occurred. These, however, will only be marginal and thus not affect the ongoing activities, as more drastic changes would require a change of the NWL or other legislation, certainly a time consuming process. The concepts in the present paper might help to provide some orientation in the ongoing discussions.