"Principal-agent" Problems in Water Management – Inviting Rentseeking and Corruption

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Introduction

Efficiency deficits in water management are endemic in many countries. Conventional approches to raising the level of performance of water management schemes focus on improvements to the technical, financial and/or organisational capacities of the involved service providers and – more importantly - of the water users. Such approaches often overlook a number of significant problems which are causes of inefficiencies in the first place. These problems relate to the fact that efficiency deficits may be well in the interest of many of the influential stakeholders involved. Since problems of this kind may undermine all potential gains from technical, financial or organisational improvements, it is essential to focus more attention on their analysis and prevention.

The presentation addresses the so-called "principal-agent" problems, which are a major factor in this context. After presenting their essential characteristics, examples are provided from the irrigation sector. Finally, coping strategies are highlighted.

Problem Analysis

Temptations to abuse water systems and to uphold or introduce inefficiencies for personal gain stem partly from the above mentioned "principal-agent problems". Generally speaking, principal-agent problems are deficiencies related to contracts and agreements between exchange partners, e.g. between the provider and the client of goods or services . Problems of this kind are due to the fact that the provider side has more information about the provision process than does the client side. Such a so-called "information asymmetry" is, on the one hand, both necessary and desirable since it reflects the division of labour and the specialisation of the provider. On the other hand, though, the actor who is not as well informed, the "principal" (in our case the client of the service delivery) runs the risk of being exploited by the better informed provider side, the "agent". Whether or not the agent will behave in such a manner depends on the nature of the "contract"[2] between the two parties.

Problems like these are particularly common in medium and large scale water allocation all over the world and they come to the fore particularly under conditions of water scarcity. They result in highly dysfunctional motivation patterns on the part of the key players. Such problems invite rentseeking behaviour and corruption, and tackling such problems is a delicate matter. This is why they tend to be "overlooked" in problem analyses, despite their visibility in everyday system operations. It is important to emphasise that structural problems like these will tend to encourage opportunistic behaviour whereever they occur - independent of the regional or cultural context in which a particular organisation operates. Hence, it is essential to be aware of such problems and to devise ways how to circumvent or counteract them.

[2] The term "contract" needs to be understood in a wide sense here and may relate to formal or informal contracts, to mutual agreements, common practices, laws, rules, regulations or to a mixture of such coordination mechanisms.

Discussion of the Findings

The presentation concentrates on one type of principal agent problem, the so-called "Moral Hazard problem". A Moral Hazard risk may arise in situations where two actors are joined in a client-supplier relationship. The client (principal) commissions the supplier (agent) to perform a service on his behalf and thus confers a certain scope for decision-making on the supplier. If we presume that the agent's activities cannot be directly monitored by the client, and that the agent makes certain observations and experiences during the execution of the order which the principal has not made, then this leads to an 'asymmetrical information status' between the two actors concerned. If it is also presumed that the order is so complex that it can be influenced by many other external factors, the following problem can arise: Following conclusion of the contract, the agent might reduce his efforts to fulfil the order (reduce his cost), without the principal being able to call him to account. The agent can always claim that a poor result is due to circumstances beyond his control, thus relieving him of any guilt or responsibility.

The example most often cited when referring to water management is the case of irrigation (see e.g. the much cited paper of Wade, 1982). It relates to an irrigation engineer or ditch rider who maintains unpredictable service delivery in order to be able to extract side-payments from farmers for timely delivery. This corresponds to a Moral Hazard situation if the following circumstances prevail: External conditions are such that actual water availability is fluctuating. It is only the engineer who has information about frequency and occurrence of certain water discharges that are available for distribution. The farmer does not share this information. Hence, he or she will not know in advance when and how much water (s)he will receive. The engineer, on the other hand, may use the "hidden information" about available discharges to use the situation to his or her advantage, provide preferential water allocation to selected farmers and extract illegal sidepayments for a service (s)he is supposed to provide anyway. In such a situation it will be difficult for the farmer to hold the engineer accountable, since discharges actually fluctuate and the engineer may refer to the unpredictability of this fluctuation as an excuse.

While a single case of such "petty corruption" may be of little relevance as compared to large-scale corruption in the context of large infrastructure investments, it may seriously hamper efforts to improve the efficiency of irrigation water delivery if it becomes endemic throughout the hierarchical structure of an irrigation agency. Since such a set-up may provide additional income to many of the (generally underpaid) irrigation professionals, and since large and wealthy farmers will get preferential allocation, the system can degenerate into a very stable condition of inefficiency. In fact, none of the influential actors (the irrigation engineers and the large farmers) may have any motivation to change this situation – on the contrary. It is clear that any effort to improve irrigation system performance by means of technical

improvements or managerial prescriptions will stand little chance of success unless such motivational structures can be changed as well.

Contractual mechanisms for resolving the Moral Hazard problem are, in principle, either geared to redressing the asymmetrical information status or to bringing the agent's interests more in line with those of the principal. Both mechanisms generate costs. Attempts to balance out the information status generate monitoring costs, whilst harmonising interests calls for a system of incentives, which again produces costs.

Concrete measures designed to limit the moral-hazard risk by way of redressing the asymmetrical information status include: task profiles that facilitate monitoring, management information systems or else co-ownership and team formation (for social control). Ways to improve incentives and bring the agent's interests in line with those of the principle may be bonus payments, prospects for future contracts or contract improvements and manipulating the agent's various alternatives for action (in order to prevent him from having more attractive options to the use of the resources available to him).

A remarkable way of redressing the asymmetrical information status in water user associations has been reported from traditional irrigation schemes in the Andes (Huppert and Urban, 1998). Some irrigation communities in the Bolivian Andes still apply the principle of "rotating tasks" ("cargos rotativos"). Members of different age groups are responsible for different tasks in the operation and maintenance of the irrigation system. This age-dependant rotation means that in the course of time everyone becomes familiar with all the essential tasks needed to keep the system functional. At the same time, it prevents one particular person from gaining specialised knowledge which is not available to the others. In other words, it prevents the emergence of an asymmetrical information status and hence the existence of Moral Hazard situations.

An example of an incentive based prevention of potential Moral Hazard risks in irrigation is provided by franchise systems like the one the French Government is using in the Gascogne (Huppert and Hagen 1999). There is a 10-year concession to the "Compagnie d'Aménagement des Coteaux de Gascogne" (CACG) to provide operation and maintenance services to water users in irrigation systems. If CACG as a provider does not perform in the desired way, another provider will be chosen for the next term. Creating a credible "threat of competition" between alternative providers will act as an incentive for them to restrict themselves and not to deviate too far from the buyer's interests when deciding upon the allocation of scarce resources. If wasteful suppliers fail to comply with the buyer's interests, they lose their source of income.

But how can one redress the Moral Hazard situation mentioned above, where an irrigation engineer or ditchrider tries to keep water delivery unpredictable to the farmer in order to secure illegal payments? Clearly, functioning management information systems may help to rectify such deficiencies. But what, if it is not in the interest of the engineers to make such a system function effectively? A guiding

principle is to try to link service level and quality to the respective actors' payoffs (monetary and non-monetary). Thus unifying decision rights over input resources with the right to collect payoffs in relation to the service benefit from those decisions may solve the problem . However, this must be coupled to the empowerment of the farmer-clients so that they gain access to relevant information, especially in cases where external influences (such as varying water availability) make it difficult to establish a fixed level of service.

Lessons learned with recent irrigation reforms in Andhra Pradesh, India illustrate how such approaches can be applied in practice. Svendsen and Huppert (2000) report that previously, due to intransparencies of the kind described above, engineering staff could play one farmer off against another, opening up opportunities to secure and bid up side payment for preferential treatment in water delivery. However, irrigation reforms introduced two important changes: First, Water User Associations (WUA) were established at the level of the minor canals and committees were formed on the next higher level of canals (Distributory Committees). Secondly, specified on-site engineers from the responsible irrigation agency were allocated new roles as so-called Competent Authority (CA). They are charged with supporting the Committees and WUA's in technical matters. Under the new set-up, the Distributory Committee interacts with the Competent Authority to plan a water delivery schedule for all the WUA's represented in that Committee. Thus, water availability and water allocation are made transparent – also for the individual WUAs. The farmers now have a hand in arranging service delivery, a process which had previously bypassed them entirely. Their only function under the old setup was to use whatever water they received to grow crops. The change is important, in terms of incentives, because the users of the service are the ones with the strongest conceivable incentive to arrange the highest possible quality of irrigation service. They replace, in the function of arranging the water delivery schedule, irrigation technicians and engineers who have little or no stake in the quality of service they provide, and thus little incentive to act in the interests of the farmers. In this way, the farmers' new role in arranging service provision helps to close off the avenues for rent seeking behaviour open to water delivery staff.

Conclusions

Given increasing water scarcity problems worldwide, improving the efficiency of water management, particularly in irrigation, is of the utmost importance. However, many irrigation systems are locked in an inefficiency trap. This trap is due to the fact that inefficient water delivery and maintenance may provide sources for additional income or at least offer non-material advantages to the providing managers or technicians. In terms of the personal goals of income maximization and extension of socio-economic power that are pursued (not only) by most of the irrigation staff, such system inefficiencies may be highly efficient in terms of personal gain. More often than not they pave the way to rent-seeking activities and corruption. Therefore, the common practice of searching for technical and / or economic / financial solutions to the efficiency problem in irrigation is bound to fail in many cases. While this will often be the case in state-administered systems, farmer-managed irrigation systems are by no means immune to such incentive distortions.

It is therefore imperative to give more space to principal-agent-analysis in water management, and to search for solutions to problems of transparency and accountability. The degree of commitment attached by local governments to such approaches may be a good indicator of the chances for real performance improvements in the irrigation sector of the country in question.

References

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