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## Project Politics, Priorities and Participation in Rural Water Schemes

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**ABSTRACT:** Governments, NGOs and financiers invest considerable resources in rural domestic water supplies and irrigation development. However, elite capture and underuse, if not complete abandonment, are frequent. While the blame is often put on 'corrupt, lazy and indisciplined' communities, this article explores the question of how the public water sector itself contributes to this state of affairs. Four case studies, which are part of the research project *Cooperation and Conflict in Local Water Governance*, are examined: two domestic water supply projects (Mali, Vietnam); one participatory multiple use project (Zambia); and one large-scale irrigation project (Bolivia). It was found that accountability of water projects was upward and tended to lie in construction targets for single uses with already allocated funding. This rendered project implementers dependent upon the village elite for timely spending. Yet, the elite appeared hardly motivated to maintain communal schemes, unless they themselves benefited. The dependency of projects on the elite can be reduced by ensuring participatory and inclusive planning that meets the project's conditions before budget allocation. Although such approaches are common outside the water sector, a barrier in the water sector is that central public funds are negotiated by each sector by profiling unique expertise and single livelihood goals, which trickle down as single use silos. The article concludes with reflections on plausible benefits of participatory multiple use services for equity and sustainability.

**KEYWORDS:** Accountability, domestic water supply, equity, irrigation, participatory planning, sustainability, Mali, Vietnam, Zambia, Bolivia

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### RATIONALE AND AIM

A considerable part of the budgets of governments, NGOs and the international donor and financing community is spent on water lifting, storage and conveyance infrastructure to bring water to homes and fields in rural and peri-urban areas in developing countries. In this way, as the global discourse tells, water projects contribute to the Millennium Development Goals (MDGs), which aim at halving the proportion of people without access to drinking water and those living on less than one US dollar per day by 2015. The United Nations' declaration of water as a human right, ratified by progressive governments as in Bolivia (UN, 2010), further commits governments and donors to deliver water for domestic uses to all citizens for health. In the productive water sector global financiers and development organisations, such as the World Bank, International Fund for Agricultural Development, Food and Agriculture Organisation of the United Nations, and regional organisations and banks re-engaged in agriculture and irrigation, with the stated aims of unlocking farmers' productive potential for food and income (NEPAD, 2003; World Bank, 2007). The prospects of less predictable rainfall and more extreme droughts and floods under climate change reinforce the call for accelerating

improvements in water lifting, storage and conveyance, often in the name of protecting those who will be hit hardest: the poor.

However, informally, the counter-narrative has been equally acknowledged in mainstream discourse by now: the results of rural water projects are often disappointing. The proportions of domestic schemes that work only partially, and schemes that are even fully abandoned, are high and percentages between 50 and 80 are not unusual (Skinner, 2009). Formal command areas of irrigation schemes are underused, and expensive rehabilitations have to make up for chronic lack of maintenance. Moreover, if schemes work, they are more often than not captured by the elite. 'Elite' refers to the – mostly male – influential traditional village chiefs, modern village leaders, landlords, political leaders, local councillors, successful businessmen, teachers, and war veterans, who are generally wealthier, better educated, more mobile, and better connected to influential networks outside the community than the majority of community members. Instead of closing the social gaps by class, caste, ethnicity and gender, water projects often end up reinforcing the gaps between the 'haves' and 'have-nots'.

In trying to explain these failures, the blame is often put on communities. The leadership would be corrupt and only interested in self-enrichment and power. Water users would be indisciplined and lazy, passively waiting for others to give them water for free as 'handouts'. These myths have largely been debunked by pointing at dynamic, complex intra-community relations (Bruns and Meinzen-Dick, 2000; Boelens et al., 2007; Van Koppen et al., 2007; Gómez and Ravnborg, 2011; Funder et al., this issue). Power and patronage relationships curtail the options of the marginalised to negotiate their share in the benefits of new public resources. At the same time, hierarchies are not absolute and also encompass performance-based accountability to constituencies by both traditional and modern leaders, local safety nets, some resource use rights for marginalised groups, and notions of rights to water that well align with the notions enshrined in international human rights (Derman et al., 2007).

If communities cannot easily be blamed for project failure, what is the role of projects' own approaches in contributing to elite capture and lack of scheme sustainability? This is the question explored in this article. As Mehta et al. (2001) point out public projects are typically conceived as rational, well-structured and politically neutral local actions. This is far from reality. Projects are rather a matter of fuzziness, uncertainty, social interactions, and bargaining across scales up to global levels (Mehta et al., 2001). Project rationalities are often over-simplified and over-generalised and serve own goals, rather than referring to an empirical reality. For example, the widespread discourse of 'community participation' can refer to situations in which, at the one extreme, villagers just answer questionnaires and, at the other extreme, long-term processes are undertaken in which all community groups, including the marginalised and their genuine representatives decide about priority problems and the allocation of external financial, institutional and technical support, and lead implementation, all in a transparent and accountable manner.

In searching for the ways in which projects set themselves up for elite capture and lack of sustainability, we explore the evolving events at the interface of local-level project staff, community elite and other members during the start, planning, design, and construction or rehabilitation phases and especially the post-construction phase, when sustainability issues and consolidation or new forms of elite capture emerge. We also explore how local staff operates within intermediate, national and global structures of governments and NGOs.

Focus is on accountability and incentive structures as important drivers of project actions and impacts (Venot, 2011). In general, accountability in governments and many NGOs that intervene for development and poverty alleviation is upwards. Livelihood goals are set and budgets are allocated at a central level for specific livelihood benefits, such as health, education, income generation, and others related to the MDGs. This also applies to the conventional water sectors. Global and national centralised goals in both the Water, Sanitation and Hygiene (WASH) sector and the irrigation sector are coined in terms of realising infrastructure and other measures for single water uses and corresponding single dimensions of wellbeing. Accordingly, the WASH sector sets accountability and measures its performance largely in terms of numbers of water points and surrounding households within a certain

distance for health and hygiene. The irrigation sector holds itself accountable in terms of infrastructure realised, hectares of irrigation, crop yields, and income. Budgets to realise goals of infrastructure and other measures are allocated at central levels. Implementation of such budgeted programmes implies that 'community participation' tends to be confined upfront to implementing infrastructure and related measures for single uses.

Obviously, the assumption that schemes designed for one use are used for that single purpose only is flawed indeed. This is certainly the case in the areas we are focusing on here: rural areas in low- and middle-income countries where livelihoods are diversified and agriculture-based, so where people depend in many ways on water for drinking, other domestic uses, livestock watering, irrigation, fisheries, forestry, small-scale enterprise and cultural values. They use multiple sources, including public schemes, for multiple uses. The ability to combine rain, run-off, surface streams and storage, and wetlands, in conjunction with groundwater enables people to adapt to and cope with increasingly unpredictable seasonal and annual fluctuations for using water at homesteads, in fields and grazing areas, and elsewhere (Van Koppen et al., 2009; Smits et al., 2010). We will further explore how this gap between projects' supply-driven upward accountability and people's realities also affects elite capture and scheme sustainability.

We selected four case studies from both the WASH and irrigation sectors to answer our question. Four studies allowed some comparison of similarities and differences to identify possible patterns. By including both WASH and irrigation projects, some cross-sectoral comparison could also be made. The four cases were taken from rich in-depth analyses carried out as part of the research *Competing for Water: Understanding Conflict and Cooperation in Local Water Governance* (Ravnborg et al., 2012). For the methodology and case studies of this overall project, see Funder et al. in this issue. The studies selected for this study concern two communal piped water supply systems designed for domestic uses in Mali and Vietnam. The third case is a participatory multiple use water services project in Zambia, which led to the installation of an electric submersible pump for multiple uses. The fourth case study is about a large-scale irrigation scheme, fed by an inter-basin transfer gravity canal in Bolivia.

The next section analyses the case studies empirically. After that, the findings are compared in the light of the overall question. In the last section we draw conclusions.

## THE CASE STUDIES

### Mali Hombori piped water project

The case of *Mali's Hombori's piped water project* illustrates how piped domestic water supply schemes became part and parcel of wider village politics and traces the consequences of political interference on scheme sustainability. Water in this arid area is primarily used for domestic uses and cattle; it is too precious for dry-season irrigation and most land in this mainly residential area is too rocky for cultivation. In Hombori, over-sophisticated water supply schemes continued to be gifts of the rulers to their faithful constituencies or electorate. Already in 1953, colonial rulers rewarded the chief of Hombori and his clan, who lived on the top of a hill, with a piped water supply scheme to express their appreciation for his collaboration. However, the technologies were so sophisticated, and technicians and spare parts so scarce, that the system soon broke down and remained unused.

The chieftaincy clan underwent an important change around the 1990s when a relative moved down the hill, where a national road passed and where accessibility was significantly better. Some government departments had also settled at that site. Gradually, newcomers joined the hamlet, attracted by the new economic opportunities. The newcomers saw the relative of the chief who had moved downhill as the representative of the traditional chieftaincy. Yet, the traditional chief uphill tried to keep claims over all downhill inhabitants as his own constituency.

In 2001, a new donor-supported public water supply project was brought to Hombori through relatives working in the government department concerned. Within the available technologies on offer

and the limited budget, the initiators reached consensus to install a solar pump. However, this technology lacked the capacity to pump uphill. Thus, it implicitly favoured the inhabitants downhill and the chief's relative there. Although none of the uphill inhabitants used, or even wanted to use the solar pump powered standpipes, the traditional chief uphill and his allies insisted that they should be represented in the management committee. This conflict delayed the start of the utilisation of the system. Representatives of outside agencies had to come to negotiate an agreement on an equal representation of uphill elite (with a constituency of non-users) and downhill elite (with scheme users). The system soon broke down. It was never repaired, although users had contributed significant fees for that purpose. As the rumour spread in Hombori, the downhill relative, who had become mayor in Mali's new decentralisation policy in the meantime, mismanaged the water fees collected. In his new role, he needed money to receive the many visitors – a higher priority for his political career than repairing a contested water supply system.

In 2007, the President of Mali, who himself belonged to the clan of this area, repeated his colonial predecessors' gesture and offered Hombori a new water supply scheme, but now with a pump that was powerful enough to provide water to both the uphill and downhill constituencies. Some of the existing standpipes were integrated in the design. An outside commercial public agency, the public-private company that provides water to the capital of Bamako, was expected to ensure sustainable and conflict-free operation and management from the fees raised.

While the prestigious piped water supply systems were almost continuously idle since 1953, the women in charge of fetching water for domestic uses and the boys and men herding livestock continued to use their alternative water sources. With government support, just down the hill, three large-diameter wells had been constructed in the course of time. Government also assisted with relatively simple and cheap repair. These wells were used for human and animal consumption. The taste of water from these wells was more appreciated than that of the piped scheme. Local rules to avoid competition were developed and effectively enforced: one well was for the uphill people to come down, fetch and carry water up; one well was for the downhill people; and the well close to the cemetery was for cattle. Interestingly, a young man in the village with a small group of friends had taken the initiative to mediate in establishing and monitoring these rules. Users adhered well to this initiative that was in everybody's interest. Another informal initiative also worked well: especially during April, the driest month, groundwater tables in the wells lowered and water collection became an even more arduous task than it normally was. Small entrepreneurs (females), the 'tabinka', specialised in drawing water during this time, and selling it in bags of animal skins to the entire village.

In conclusion, the Hombori case shows the importance of politics and prestige in water supply projects, and its negative implications for factual scheme use and maintenance. All negotiations on these ambitious, largely predetermined technologies remained in the hands of the political leadership. Yet, neither the leadership's ability nor its willingness to ensure the repair of these schemes was sufficiently strong. Their re-election also depended on other efforts than successful water supply schemes, while they were hardly accountable on how they spent collected fees. The existence of well-managed, viable and cheaper water alternatives with a good taste reduced everybody's incentives for scheme sustainability even further. These alternative sources may well affect the scheme initiated in 2007 as well. The public agency from the capital city Bamako, where domestic uses by a middle class are more important than rural people's domestic uses and livestock-watering in Hombori, is expected to manage the scheme. However, it may well be at pains to find enough clients who are willing to start paying more for water. By excluding women as the ones who are mainly responsible for domestic water uses from the planning phase and technology choice, their ability and willingness, and those of their husbands, to pay for domestic uses remain uncertain. Willingness to pay for cattle-watering is even more unlikely to exist as cattle can be brought to the cheaper wells.

### **Vietnam Yen Khe piped water project**

In the *Vietnam Yen Khe piped water project*, the project agencies assumed that communal systems bring equal benefits to all (Huong et al., 2011). This appeared over-optimistic. Instead, existing social inequities were reinforced by project procedures and, as in the Mali case, the village elites who played the key role in the planning phase appeared hardly interested in the scheme's sustainable management. As elaborated by Funder et al. in this issue, and briefly summarised here, a large national development programme had set ambitious goals of constructing many water supply schemes for domestic uses. The standard technology was piped gravity flows with several tanks for storage. While gravity is an obvious cheap source of energy in these hilly areas, the programme's assumption was that larger communal systems reach more people. With a design norm for domestic uses only, more people could have at least water for domestic uses, it was thought. A communal scheme with some water for many would be a hardwire equity design.

In communist Vietnam, this programme, like many other state programmes, was locally implemented through the political leaders of the district and village committees. The siting of the scheme's storage tanks and communal tap stands was also decided within these committees. Although most elite already owned deep wells at their homesteads, they welcomed the new system as an extra water source. In the village of Trung Than in particular, the elite interfered even during the siting of the storage tank and communal tap stands. On the day of the construction they ensured that the new communal tap stands and storage tank were located very near to, or at, their own compounds.

The piped domestic water system functioned well for 5-6 months, filling up all public tanks of the system. However, 'illegal' use for fish ponds and gardening by households in the proximity of the pipes and tanks expanded. Especially the elite established such illegal connections along the pipes to bring water to their houses and fields to diversify their water sources. This rapidly led to empty public tanks. Moreover, the system started to suffer from poor maintenance, exacerbating water scarcity.

The poorer community members were most affected by the inequitable use and breakdown of the water scheme because they lacked the easily accessible alternative homestead wells that the elite had. As they would have to walk far, they were unhappy about the illegal connections and were motivated to contribute to the repair. However, they refrained from expressing complaints directly to the defaulting elite. Patronage relationships rendered them dependent on the elite for work, loans, and sometimes even food. Such social security was more important than water security. Moreover, in some cases, the poor asked the elite to use their illegal connections as well, reinforcing both patronage and free-riding. It was only indirectly that the poorer members sought support for their complaints with friendly and trusted higher-level authorities. When the first collective repair was organised, the poor contributed actively. But there were breakdowns again. Mobilising the elite for another joint effort for repair appeared impossible.

Thus, the assumption that quick delivery of standard communal schemes with high economies of scale would quickly and equitably reach many beneficiaries led to the opposite. The national programme's main goal was having many schemes constructed, so it made all sense to use the hierarchical village structures for rapid construction. This advantaged the elite from the outset in the siting not only during the design phase but also on the day of construction. Their initial role in facilitating the project added to their power: to make illegal connections to meet all their needs, which were, not surprisingly, both domestic and productive; to co-opt others to share in their illegal practices; and to continue these practices even while being fined. Yet, the alternative water sources of the elite gave them less incentive to take up the organisational obligations that the national planners had expected them to do. Their lack of interest was at the detriment of the poorer water users, many of whom only had the streams as alternative sources. Communal schemes fail to bring hardwire equity if they are to be shared by hierarchically related people.

These events also illustrate the intervening agency's error of assuming that infrastructure is only used for the single use that happens to be the mandate of the sector. People's water needs are multiple and especially the better-off have more land and other assets to use more water productively. Productive water uses tend to exacerbate social inequities into even stronger inequities in water use than domestic water uses.

Project outcomes would probably have been more pro-poor and sustainable if the projects' construction goals had been replaced by procedures and criteria that start with needs and lack of alternative water sources. More technology choice to well-targeted marginalised groups could have been offered. This might have led to more decentralised, smaller schemes for more homogenous groups on sites that were selected with a stronger voice of the marginalised. Such agreed site selection would have been reinforced on the day of construction. The more marginalised would also have needed water for small-scale productive uses. For the land-poor and landless, their homesteads would even have been the main site to use water for production. Higher design norms than just for domestic uses would have accommodated those productive uses, and would have closed the gap between the 'haves' and 'have-nots' faster. However, such procedure would have required time and resources to facilitate inclusive planning and providing technology choice, and negotiating the elite's endorsement, if not pro-active support to such an approach. This would have meant a delay for national programme managers with ambitious programme targets in terms of infrastructure constructed with already allocated budgets. The latter would have underperformed.

### **Zambia Iliza submersible pump**

The third case of the *Zambia Iliza submersible pump* is especially revealing because this donor-supported project intended to pioneer a participatory, integrated approach of water services for multiple uses (Funder et al., 2010). The project did recognise people's existing water management arrangements of multiple sources and their multiple water needs. The project adopted a participatory approach in which one year was taken to identify and train an implementing agency willing to pioneer this new approach, and one year for first contacts and planning in the selected district and potential beneficiary villages. The total project budget had an overall ceiling but its allocation was left open for any identified water need, and to some extent for activities outside the water sector. As shown below, this approach contributed to sustainability of investments made. However, it failed to avoid elite capture.

As is often the case, the implementing agency of this international donor-supported innovation project resided far away and travel costs were high. Therefore, a 'project field coordinator' was appointed to factually implement the project. This was a person known for his hard work in an earlier project with the same implementing agency. The message that a new project was coming with funds for water technologies spread quickly in the selected district. An elite, Headman A of Iliza farm, set out to ensure that his own area was selected as a beneficiary area. To emphasise 'democratic participation and needs identification' he collected signatures of neighbours expressing their joint wish that one of the sub-projects of this new project came to their area. In the overall project's participatory workshop where the donor's resources were to be allocated, Headman A participated as the only inhabitant of that area. This list of signatures definitely helped him in arguing his case for groundwater lifting technology in his area. Back home, he claimed, validly, that 'he had brought the project'.

Subsequently, intensive debates developed, especially with a neighbouring wealthy farmer Headman B, about the type of lifting technology to be chosen and the precise site of that technology. The choice of both headmen fell on a new expensive, powerful submersible pump linked to the electricity line, which run over the homesteads of both headmen. A site precisely in-between the two headmen's homesteads, was carefully identified. Nevertheless, on the day of drilling of the borehole, Headman A convinced the drillers to drill in his own yard, near his house, to the unhappy surprise of all others. With this water, his family expanded its gardens, besides using it for domestic uses and livestock.

Own investments in additional pipes rendered the gardening a flourishing and, in this area, new enterprise. Strict fee payment for the electricity bill of the pump was introduced among users, allegedly including his near kin on an equal basis. In any case, this pump is sustainably used for health, reduced drudgery, food security and income, in line with overall donors' goals.

Neighbours who had signed the petition for the pump kept negotiating to also get access to what they still saw as a 'communal pump', even though now located at Headman A's homestead. Some surrounding households proposed to connect pipes to their homesteads, but Headman A refused. When an animal of neighbouring Headman B came to drink, Headman A killed it. Unable or unwilling to act otherwise, this event triggered Headman B to dig his own deep well for multiple uses. The poorer signatories of the petition were discouraged by the high fees levied for water. Even the chair of the local government's Area Committee, who was a neighbour and had signed the petition, could not change the situation. Initially, his wife came to the submersible pump to fetch water for domestic uses. However, she was made to feel that the project's pump had become a 'private pump', so she decided to return to the more distant well at the clinic. Protest was difficult as the Area Committee chair came from another area, and the land where the couple lived was owned by Headman A. An elected ward councillor outside the circle of signatories did raise his voice in protest about this appropriation of public resources, but also in vain. So for all others, there was at best some indirect impact. As for Headman B, a neighbouring poor couple that stopped taking water from the electric pump because of the high fees also realised the benefits of irrigated gardening and dug their own shallow well for gardening and domestic uses.

Among the project partners opinions diverged. Staff from the implementing agency preferred working with wealthier farmers, like Headman A. Success stories like his would ensure sustainable benefits and also serve as an example and encourage others to replicate – which happened. Others, including the government district officers and the donor representatives, tried to redress this elite capture and exclusion of others as soon as they realised that this was happening. Accordingly, the district community development officer called meetings to discuss the broader access of neighbours to the 'communal' pump, but in vain. Throughout these events, the project field coordinator was also unable to interfere effectively. As the donor representatives realised only later, Headman A was his father-in-law.

In sum, this project design left technology choice and siting for any priority water use to beneficiaries. However, opening up fund allocation to 'everyone' without inclusive procedures and criteria self-selected those with the power to first make the case and then keep managing the conflicts. They also had the entrepreneurial spirit and sufficient land to make beneficial use of more water; they wanted to scale up and install modern mechanised technology. This case shows how elite capture can be in projects' own interests, for two reasons. First, as for the earlier two cases, the projects' accountability remained upwards. Project managers still had to spend resources that had already been allocated, even though the period was longer and the precise allocation was left to communities. The elite were quicker and could spend larger amounts, also at lower efforts and transaction costs for the implementing agencies. Second, in the case of Iliza, this led to sustainable multiple livelihood benefits that met the donor's general sustainability and livelihoods criteria. It was possible 'to show something is working'. The fact that the community had more say in the fund allocation probably contributed to these sustainable impacts, unlike the former two cases in which outside project agencies took the responsibility of vesting project powers in the elite only. Yet, equity goals were not reached. Villagers kept contesting the legitimacy of the allocation of these public resources. The elite in Iliza had to put in more efforts to legitimise their actions.

An alternative and more inclusive approach would have been possible, though. In such an approach in a selected the area, local public professionals and representatives with at least some institutionalised accountability would have led a participatory process, starting by targeting the neediest. Instead of handpicked individuals reporting to distant agencies, government community development officers, technical extension workers, ward councillors and Area Committee chair could have been called

together as a start. Clear targeting and process criteria by the project would have guided these normative processes. An inclusive planning process would have been facilitated according to the well-known steps of diagnosis, needs assessment, identification of possible solutions, prioritisation and action plan. People would have been timely informed about a range of technology and siting options out of which to make an informed choice. Multi-purpose infrastructure for more livelihood benefits would have been explored from the outset. Last but not least, a budget would only have been allocated once the proposed action plan would have met all equity and sustainability criteria. By equally including women and men, a factual priority for more water nearby homesteads could well have emerged. Several hand pumps for many more beneficiaries, instead of one privatised electric pump could have been the majority's preference in this area.

### **Bolivia Totora Qhocha canal project**

The last case study of the *Bolivia Totora Qhocha canal* takes the issues of the earlier three cases to a higher aggregate level. Moreover, it considers an irrigation project. This allows us to examine any differences on the ground compared to the earlier 'domestic' and multiple use schemes, other than scale issues and this project's decision to prioritise irrigation. Further, in this case, poorer communities have an upstream location and are well organised, which gives better negotiation opportunities than in the former cases.

The *Bolivia Totora Qhocha canal project* was a government- and donor-supported large-scale irrigation project in the mountainous areas near Cochabamba, Bolivia. Unlike the earlier case studies, this irrigation project did not make an attempt to reach 'everybody' and in particular the marginalised. On the contrary, the project's formal goal was to boost commercial farming by well-organised larger-scale farmers, who had also been lobbying for the project.

The technical design of this gravity scheme encompassed a long feeder canal upstream that channels water from a neighbouring basin. In the project planners' irrigation scheme designs, the upstream lands along this inter-basin transfer canal were 'empty spaces'. Yet, these areas were inhabited by communities, who had already developed intricate water systems and institutions, combining multiple sources for multiple uses. As soon as construction started, the upstream communities started negotiating. In order to safeguard their own systems, they asked the project implementers to modify the design of one intake. Later on, the upstream communities negotiated with the water user associations of the Totora Qhocha system for some intakes in the new canal that would improve their traditional irrigation systems during the dry season. Furthermore, the upstream communities built a dam in one of the catchments to implement a new irrigation system. They included the inter-basin transfer canal as part of this new dam and scheme.

At the downside, there were also new risks as a result of the canal designers' neglect of these areas as 'empty spaces'. Thus, there were no proper bridges, so animals trying to cross the canal drowned. One child trying to save the animals also drowned. Moreover, during the rainy season, the canal tended to overflow, which led to flooding. The continued canal seepage also increasingly affected adjacent plots.

The downstream larger-scale farmers in the Totora Qhocha irrigation scheme realised that the inter-basin transfer canal had many more users than the formally planned irrigation system alone. So they undertook to establish an agreement with the upstream communities on the shared operation and maintenance of the inter-basin transfer canal. The agreement, which was signed in 1992, established that both groups should participate in the infrastructure maintenance at the start of the dry season; that the downstream Totora Qhocha users would use the canal for their larger scheme during the rainy season; and that the upstream communities would use it for their smaller systems during the dry season.

As time passed, the infrastructure gradually deteriorated and the maintenance work took longer and longer. Therefore, the period during which the upstream users could use the canal became shorter and

shorter. Seepage and flooding also continued. Therefore, the upstream communities started negotiating the review of the agreement of 1992. When the Totora Qhochá users failed to pay attention to this demand, they organised into a municipal federation of upstream irrigators, again demanding the review of the agreement. However, the claims of this by the now quite powerful federation kept being ignored by the downstream users. Therefore, in 2008-2009, the upstream people enforced their claim by blocking the inter-basin canal, demanding shorter maintenance periods, an increase of the volume of water taken from the catchment in their favour, and compensation in cash for the damaged land. This led to the signing of a new agreement that met their demands in 2009. Although the downstream users represented the majority in these negotiations and kept control over most management decisions, the upstream position allowed the poorer upstream users to enforce that the downstream users respected their obligations of the agreement as well. Their organisation into a federation further enabled effective negotiation.

In sum, the Totora Qhochá case invalidates the assumption that there can be anything like 'empty spaces' in areas where water passes, and even less in areas of age-old dynamic informal water development and management of multiple sources for multiple uses. While irrigation engineers try to focus on water delivery to fields, they cannot escape from water uses and management at higher spatial scales. Assuming that one can change only one part is unrealistic. Similarly, the assumption of irrigation planners and designers that water delivery to commercial irrigation would be the priority was immediately contested in reality. Formally, the national law, which stipulates that domestic uses are top priority and a basic human right, declares a priority for irrigation over domestic uses as unlawful.

The Totora Qhochá case highlights another peculiarity. From a banker's perspective, the many beneficial uses of the inter-basin canal in the upstream areas represent higher health, livelihood and income returns to the investments made. Yet, confining themselves to their single use mandate, irrigation professionals only calculated the returns from the hectares and crop yields in the formal downstream irrigation scheme. If the 'empty spaces' had been included in a holistic project planning and design, those benefits would have been valued as well. Moreover, from the outset, better win-win arrangements would have been identified, bridges built, flooding avoided and sharing arrangements agreed. Donors would have appreciated the higher benefit-cost ratios. This would especially have saved the enormous transaction costs for the poor upstream communities.

## DISCUSSION

Returning to the central question of this article: 'What is the role of projects in elite capture and lack of sustainability of water projects?', various factors come to the fore. They are strongly related to the conventional accountability structures in the public water sector. The answers raise the new question of how those factors that promote elite capture and project failure can be overcome, and why that has not been done in the past or what the obstacles would be if it were tried in the future. Lastly, assuming that projects' accountability and incentives were changed, we summarise the potential benefits of such change.

### Projects' dependency on the elite

In supply-driven programmes that set construction and one-dimensional livelihood benefits as their performance indicators, elite capture seems as much a 'pull' factor initiated by the elite as a 'push' factor of project implementers. Project implementers rely on the elite to meet the goals of their superiors and the performance indicators in their own contracts. Politicians need allies. Bureaucrats need to show that they can spend available resources to serve their agencies' goals. Both use the networks that they have, including political alliances and kinship networks (Hombori, Mali), the communist party structures (Yen Khe, Vietnam), or larger-scale farmers (Bolivia). The organisation of infrastructural interventions demands much work, which can be mobilised quickest by communities'

leadership. There is no incentive to do otherwise for local implementing project staff or for their supervising managers in the capitals. On the contrary, costs of transport and time would just increase.

Moreover, for productive water uses, projects tend to prefer the better-off because they can make more income out of the larger quantities of water on their larger plots and for their larger herds and enterprises. Their access to the many other inputs that render water use beneficial, such as fertilisers, markets, or veterinary care further meets project goals in terms of overall wealth generated. There is something to show, as in Iliza farm. Equity is hardly a concern in the productive water sector. Targeting criteria that monitor who the beneficiaries are, or even just how many there are, are generally lacking. As the Titora Qhocha scheme illustrates, public resources can formally be channelled to the 'haves'. This is different for the general WASH sector, which tends to be more concerned about equity. Equity is enshrined in its goals: the numbers of beneficiaries are monitored, with the ultimate goal to reach everybody with access to improved water sources. By distinguishing those with and without such access, UNICEF and the World Health Organization monitor equity in public resource allocation (UNICEF/WHO, 2011). Yet, NGOs like WaterAid remain watchdogs to expose lack of targeting (Taylor, 2011).

As we saw, vesting public resources for communal action in village elites is no guarantee at all that these resources are used sustainably. The politician in Hombori, Mali, had other ambitions than repairing a broken communal scheme, from which he hardly benefited himself. Neither the power nor the motivation of his constituency was sufficient to hold him accountable for that. Anyhow, his constituency already had alternative water sources. Better endowments of alternative sources also reduced the motivation of elite members in Yen Khe, Vietnam, to take up the burden of repairing the communal scheme. Moreover, their power enabled them to be the first to break the communal rules. Besides using the scheme for multiple purposes well beyond the design norms for domestic uses, they damaged the scheme and disturbed its water distribution by illegal connections. And they got away with it. In contrast, in the Iliza farm case, Zambia and the irrigation scheme in Bolivia, uses were sustainable, but this was mainly because the elite used the public resources for their own benefits. In all cases, it would be naive to assume any more altruism among the elite than in any other social group.

In sum, the case studies showed how centralised fund allocation for supply-driven implementation tasks to achieve construction targets and narrowly defined livelihood benefits, contribute to inequitable resource allocation or lack of scheme sustainability. This raises the question whether the case studies or other evidence indicate ways in which projects can address these factors and become both more equitable and sustainable.

### **Targeted demand-driven fund allocation**

A logical inference from the findings presented above is that if government and donors want equity and sustainability, they are well advised to become less dependent on the elite as implementers of pre-set goals. One way in which this can be done is by improving the process of budget commitments. It is common in public projects that funds have to be spent as soon as they are committed. If that is the case, therefore, projects have to set and enforce conditions that enable equity and sustainability *before* such commitment. When public resources are yet to be allocated, patronage relationships can be addressed to at least some extent, because the elite still depend on the non-elite to arrive at mutually agreed interventions acceptable to the intervening agency. If conditions are not met, projects implementers and donors can withdraw and bring their resources to communities and projects that better comply with their conditions.

Participatory proposal development seems well feasible in the water sector. The pilot project for participatory water services for multiple uses in Zambia showed that there is, in principle, no problem for donors to open up and remove any single use ties to their funding, and instead ask communities what they see as their priority for any next step in their water development and management. Local competition for proposals and peer-pressure strengthened accountability. A next time, elected councilors, government officials and NGOs can facilitate and broker the match between bottom-up

defined priority needs and top-down available funding more equitably. Overtime, decision-making about budget allocation could be further decentralized for follow-up activities and other public interventions. This would finally have enhanced intervening agencies' longer-term accountability as well. Yet, such participatory planning of multiple use water services is certainly no mainstream practice as yet in the water sector, although pilot projects have also been initiated elsewhere, for example the Water Use Management Plan methodology in Nepal (RVWRMP, 2008).

Outside the water sector, participatory approaches have been piloted and applied for decades, especially by many NGOs. Since the mid-2000s, donors, financiers, and governments have also been adopting these approaches at larger scale, for example through community-driven development programmes, as in Ethiopia, Ghana, Nepal and Tanzania (Smits et al., 2010; PAF, 2010). By 'putting the poor in the driver's seat' of project identification, proposed activities are better adjusted to genuine local needs and opportunities. Own contributions are encouraged and leveraged. Implementation is closely monitored. Funding is untied, and seeks to improve many dimensions of well-being. Accountability for expenditures is ensured and monitored through process and targeting criteria. These approaches contribute to equitable and sustainable use of public funding. India's Mahatma Gandhi National Rural Employment Guarantee Scheme is applying similar approaches entirely through local government, reaching over 50 million households. In both types of participatory approaches, communities may decide to take up water projects. In India's Employment Guarantee Scheme, this happens most of the times. Over 60% of the social assets created are for water and drought-proofing (Shah et al., 2010; Verma, 2011). Most of those are expectedly for multiple uses and often combining multiple conjunctive sources (Malik, 2011).

The emergence of participatory water projects outside the water sector raises the question with even more pertinence: why has the mainstream water sector itself failed to move towards participatory approaches? It is possible to overcome those hurdles in the future? The case studies and further research on multiple use water services (MUS) suggest that two factors are playing the following roles (Van Koppen and Smits, 2011).

### **The politics of prioritisation**

As mentioned, the professional water sector is structured according to single uses, for which each sub-sector is taking accountability. The WASH sector (donor departments, specialised NGOs, specific government departments) prioritises domestic uses. The irrigation sector (often departments at different floors in the same buildings, or specialised NGOs) prioritises irrigation. This structuring according to single water uses is also reflected in a similar separation in education and research departments. Worldwide, it is even rare to find research on how communities allocate water from all multiple sources for all multiple uses, including domestic uses, without any a priori bias for one specific use (Sokile, 2005).

Obviously, there are differences between domestic and irrigation uses in terms of site, timing, volumes and quality of uses. Irrigation usually needs more water and can be seasonal. Domestic and animal water uses are year-round. Only 3-5 litres per capita per day should be safe for drinking. Other domestic and all productive uses can do with lesser quality. For urban areas in middle- and high-income countries or for large-scale irrigation schemes, water services are quite distinct. This would justify own departments. However, as all case studies showed, for informal rural and even peri-urban areas, the sectoral divides are artificial, unrealistic and counterproductive. For communities water is water. They derive as many uses and livelihoods as possible from the 'domestic' water supplies and 'irrigation' water supplies.

One reason for the persistence of sub-sectors is that technical expertise that is needed to realise more livelihood benefits from a particular water use is implicitly tied to the hardware design. As water is only one input in livelihood activities, agronomists, irrigation extension workers, sanitation and hygiene workers, or water treatment specialists seek to render different water uses more beneficial for

wellbeing. However, it is assumed that this can only happen within the respective sectors, and tied to the scheme that is specifically designed for that use. However, in multi-purpose schemes, the demand for such expertise is only increasing. Every scheme requires treatment options for 3-5 litres per capita for day of clean water, or advice on marketable irrigated crops. So the issue is to decouple expertise on how to use water more beneficially, from the engineering expertise to bring certain quantities of water of a certain quality where it should be at a specific moment.

The second factor seems as important. This factor is related to the most contested resource in any public sector: the overall pot of public resources of taxes, tariffs and transfers available for centralised allocation. In negotiating one's share, the ability to show a unique and exclusive expertise justifies a larger share. If each sector argues for its own single use scheme and related measures for each specific livelihood benefit, each sector would generate more funding under its own control. These upward negotiation criteria trickle down through the stove pipes as top-down accountability criteria. This hypothesis needs further corroboration, but could help explaining why individual professionals tend to defend their mandate. By exclusively focusing on the priority water use of his or her sector's mandate, professionals' performance and that of their superiors is improved, for a better next career opportunity. Similarly, this upward exclusivity explains why neither sector seems too interested in the livelihood benefits that are informally generated, in spite of ample evidence for over a decade of the value of such secondary and 'unplanned uses' (Bakker et al., 1999; Renwick, 2007). It might also clarify why the water sub-sectors remain odd bankers who keep denying the higher returns to investments than envisaged, just because they were not planned or happen on 'empty spaces'.

The consequence is that debates about priority allocations of public resources, and through that, allocations of water resources, are locked within sectoral divides. Structurally, there is no communication, let alone negotiation or even agreement between the sectors. Each sector just claims that his or her sector's single use mandate is the most important. In such silos, there is even less incentive for water professionals to study or engage in participatory planning, asking the different community groups what they really see as their priority water uses and what technologies and sites they would prefer to see supported.

Redressing these structural disincentives requires more than 'creative bricolage' at local levels (Merrey and Cook, this issue). Instead, top managers have to stop vesting accountability in single uses, as numbers of domestic water users or hectares and crop yields. They have to open up their development goals to all possible livelihood benefits. More importantly, from the highest levels down, accountability needs to be vested in well-defined participatory processes and criteria that enable the marginalised to lead the planning of multiple use water and other services. However, the logical implication of this plausible cause is that there is a risk that the overall public sector may start merging the domestic and irrigation sectors in order to reduce its overall funding to the water sector.

### **New opportunities of participatory multiple use water services**

We end this discussion by reflecting on plausible opportunities if the mainstream water sector were to move towards participatory multiple use water services. The first and most obvious opportunity is that asking what people want and ensuring that that is what they would get is vital for sustainability.

A second benefit is that participatory multiple use services open the option to design multi-purpose schemes. They bring more livelihood benefits in a cost-effective manner and avoid possible damage from unplanned uses. For communities at the lowest levels, as for Headman A, it was obvious to use the new electric pump for as many uses as possible. Different livelihood benefits mutually reinforced one another in virtuous upward spirals. Reduced drudgery allowed the women to spend more time in gardening. Higher incomes enabled investments in expansions of the scheme and more expenditure on health care. Similarly, at the higher aggregate levels, the benefits of multi-purpose infrastructure are equally clear. For large-scale dams, not a single development bank or investor would consider one dam for domestic uses and one dam for irrigation. However, at the levels in-between, so at the household

and community or higher scales where the WASH sector and the irrigation sector operate, multi-purpose schemes are not mainstreamed as yet.

Third, participatory multiple use services adjust to localised needs and opportunities. This is especially relevant for water resources, which strongly differ and vary in each location. Multiple use services recognise that people efficiently combine multiple sources for multiple uses at any scale and that there are no 'empty spaces'. Considering this broader land- and waterscape, also with alternative sources, allows choosing the most appropriate and resilient combination of sources and anticipating, for example, willingness to pay for expensive services.

A fourth benefit is that putting prioritisation of public resource allocation for priority water uses in people's hands unravels hierarchical resource negotiations as a contest between people, each with their multiple water needs, and not as a mystified contest between monolithic, abstract sectors. For example, by empowering women, the landless and disabled to lead such negotiations, they may well prioritise more water to everyone's homesteads for domestic and small-scale productive uses, rather than a distant irrigation scheme for the few. This would accelerate the implementation of the legal priority for domestic uses, as enshrined in all water laws. Irrigation planners would stop relegating the responsibility for meeting that human right to the WASH sector. Putting priorities in poor people's hands would also promote equity in productive water uses. Thus, water would be used more effectively to meet all MDGs as well as the human right to (domestic) water and people's socio-economic human rights.

Lastly, artificial and counter-productive differences between the WASH sector and irrigation sectors can be removed. Both sectors would open up to serve all water needs in multi-purpose schemes, while decoupling engineering expertise from technical expertise about hygiene, point of use treatment, or agronomy and value chains. The latter range of specializations becomes relevant for every scheme.

## CONCLUSIONS AND RECOMMENDATIONS

The foregoing analysis of three public water infrastructural projects showed that communities were hardly to blame for the elite capture and lack of scheme sustainability. They were not asked what they already had and what they prioritised as the next incremental step in improving their access to, and control over, their multiple water sources for their multiple needs. They had no other choice than following what the project already had decided in terms of infrastructure and one-dimensional well-being. Project officers needed the elite to rapidly implement those agendas at lowest costs. However, in two schemes, the elite were less motivated than many users to maintain the communal schemes as envisaged. In the other two cases, the elite had negotiated clear benefits for themselves and used the project's investments sustainably. However, this came at the expense of equity.

We suggested that for more equity and sustainability, accountability currently anchored in top-down infrastructure targets for single uses in parallel silos, has to change drastically at the global and national levels, where the water sector top managers negotiate their share in public funds for development. Instead of counting single uses as ground for public budgets and proof of performance, participatory processes and criteria that enable the marginalised to lead the planning of multiple use services, need to be defined and monitored. Adherence to projects' inclusion criteria should be a condition for budget allocation. By negotiating win-win solutions across a village, the elite can still gain as well, but will also have to abide to conditions for budget approval. The Zambian case study suggests that, if given the option to project managers, such opening up of mandates is straightforward. This is confirmed by ample experience of community-driven development outside the water sector. In the latter, water projects often emerge as communities' preferences.

The benefits of such change towards participatory multiple use water services approach, are likely to contribute to more equitable and sustainable outcomes in the water sector. This approach opens up the better possibility of designing infrastructure for multiple uses and broader livelihood benefits. It also considers communities' existing local situation of multiple uses from multiple sources as a solid and

locally appropriate basis for the next steps. Preferences for any water sources are considered, which broadens the range of options and reduces the risks of failures. If the allocation of public resources and water is put in the hands of the marginalised, including women, water professionals' structural stove-piped adherence to the own mandate can be overcome. It would also overcome the counterproductive parallel actions of the different sectors for the same people and the same water resources. The only risk of merging single use sectors is that donors will reduce overall budgets, at least if the above-mentioned political reasons for the persistence of sectors hold, and if there are no other ways to maintain the same overall share of public resources. In any case, the call for similar or even higher levels of public support will be louder by finally giving voice to the marginalised. After all, they have perhaps the strongest incentive to change the development and aid bureaucracies towards delivering the benefits that they claim to bring.

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## REFERENCES

- Bakker, M.; Barker, R.; Meinzen-Dick, R. and Konradsen, F. (Eds). 1999. *Multiple uses of water in irrigated areas: A case study from Sri Lanka*. SWIM Paper No. 8. Colombo: International Water Management Institute.
- Boelens, R.; Bustamante, R. and De Vos, H. 2007. Legal pluralism and the politics of inclusion, recognition and contestation of local water rights in the Andes. In Van Koppen, B.; Giordano, M. and Butterworth, J. (Eds), *Community-based water law and water resources management reform in developing countries*, pp. 96-113. Wallingford, UK: CABI Publishers.
- Bruns, B. and Meinzen-Dick, R. (Eds). 2000. *Negotiating water rights*. New Delhi: SAGE.
- Derman, B.; Hellum, A.; Manzungu, A.; Sithole, P. and Machiridza, R. 2007. Intersections of law, human rights and water management in Zimbabwe: Implications for rural livelihoods. In Van Koppen, B.; Giordano, M. and Butterworth, J. (Eds), *Community-based water law and water resources management reform in developing countries*, pp. 248-270. Wallingford, UK: CABI Publishers.
- Funder, M.; Bustamante, R.; Cossio V.; Huong, P.T.M.; Van Koppen, B.; Mweemba, C.; Nyambe I.; Phuong, L.T.T. and Skielboe, T. Strategies of the poorest in local water conflict and cooperation – Evidence from Zambia, Vietnam and Bolivia. This issue.
- Funder, M.; Mweemba, C.; Nyambe, I.; van Koppen, B. and Ravnborg, H.M. 2010. Understanding local water conflict and cooperation: The case of Namwala district, Zambia. *Physics and Chemistry of the Earth* 35(13-14): 758-764.
- Gómez, L.I. and Ravnborg, H.M. 2011. *Power, inequality and water governance – The role of third party involvement in water-related conflict and cooperation*. CAPRI Working Paper No. 101. Washington, DC: International Food Policy Research Institute.
- Huong, P.T.M.; Phuong, L.T.T.; Skielboe, T. and Ravnborg, H. 2011. *Poverty and access to water and water governance institutions in Con Cuong district, Nghe An Province, Vietnam* – Report on the results from a household questionnaire survey. DIIS Working Paper No. 2011: 04. Copenhagen: Danish Institute for International Studies.
- Malik, R.P.S. 2011. Rural water security through livelihood program. Unpublished draft, New Delhi: International Water Management Institute.
- Mehta, L.; Leach, M.; Newell, P.; Scoones, I.; Sivaramakrishnan, K. and Way, S. 2001. *Exploring understandings of institutions and uncertainty: New directions in natural resource management*. IDS Discussion Paper No. 372. Sussex UK: Institute for Development Studies.
- Merrey, D.J. and Cook, S. Fostering institutional creativity at multiple levels: Towards facilitated institutional bricolage. This issue.

- NEPAD (New Partnership for Africa's Development). 2003. *Comprehensive Africa Agriculture Development Program (CAADP)*. South Africa: New Partnership for Africa's Development.
- PAF (Poverty Alleviation Fund). 2010. *Annual progress report (2009/2010)*. Kathmandu: Poverty Alleviation Fund.
- Ravnborg, H.M.; Bustamante, R.; Cissé, A.; Cold-Ravnkilde, S.M.; Cossio, V.; Djiré, M.; Funder, M.; Gómez, L.I.; Le, P.; Mweemba, C.; Nyambe, I.; Paz, T.; Pham, H.; Rivas, R.; Skielboe, T. and Yen, N.T.B. 2012. The challenges of local water governance – The extent, nature and intensity of water-related conflict and cooperation. *Water Policy* 14(2): 336-357.
- Renwick, M. 2007. Multiple use water services for the poor: Assessing the state of knowledge. Arlington, VA: Winrock International USA.
- RVWRMP (Rural Village Water Resource Management Project). 2008. Guidelines for Water Use Master Plan Preparation. Kathmandu: Rural Village Water Resource Management Project
- Shah, T.; Verma, S.; Indu, R. and Hemant, P. 2010. *Asset creation through employment guarantee: Synthesis of student case studies in 9 states of India*. Anand, India: International Water Management Institute.
- Skinner, J. 2009. Where every drop counts: Tackling rural Africa's water crisis. IIED Briefing. London: International Institute for Environment and Development <http://pubs.iied.org/pdfs/17055IIED.pdf> (accessed 15 October 2011)
- Smits, S.; Van Koppen, B.; Moriarty, P. and Butterworth, J. 2010. Multiple-use services as alternative to rural water supply services – A characterisation of the approach. *Water Alternatives* 3(1): 102-121. [www.water-alternatives.org](http://www.water-alternatives.org)
- Smits, S.; J. Atengdem, B. Darteh, B. van Koppen, P. Moriarty, K. Nyanko, A. Obuobisa-Darko, E. Ofori, JP Venot, and T. Williams. 2011. Multiple Use water Services Scoping Study in Ghana. Accra: International Water Management Institute, International Water and Sanitation Center IRC and Rockefeller Foundation
- Sokile, C.S. 2005. Towards improvement of institutional frameworks for intersectoral water management. The case of Mkoji sub catchment of the Great Ruaha River in the Rufiji basin, Tanzania. PhD thesis, University of Dar-es-Salaam, Tanzania.
- Taylor, B. and WaterAid. 2011. Enhancing local government accountability: Where are the opportunities? [www.policyforum-tz.org/files/EnhanceLocalGovernmentAccountability.pdf](http://www.policyforum-tz.org/files/EnhanceLocalGovernmentAccountability.pdf) (accessed 24 December 2011)
- UN (United Nations, Office of the High Commissioner for Human Rights). 2010. *Human rights and access to safe drinking water and sanitation*. Resolution A/HRC/15/L.14. Geneva: Office of the United Nations High Commissioner for Human Rights.
- UNICEF/WHO. 2011. Drinking water equity, safety and sustainability. Joint monitoring programme for water supply and sanitation. [www.unicef.org/media/media\\_61057.html](http://www.unicef.org/media/media_61057.html) (accessed 4 January 2012)
- Van Koppen, B.; Giordano, M. and Butterworth, J. (Eds). 2007. *Community-based water law and water resources management reform in developing countries*. Comprehensive Assessment of Water Management in Agriculture Series No. 5. Wallingford, UK: CABI Publishers.
- Van Koppen, B.; Smits, S.; Moriarty, P.; Penning de Vries, F.; Mikhail, M. and Boelee, E. 2009. *Climbing the water ladder: Multiple-use water services for poverty reduction*. Technical Paper Series No. 52. The Hague, the Netherlands: IRC International Water and Sanitation Centre, International Water Management Institute and Challenge Program on Water and Food. [www.irc.nl/publications](http://www.irc.nl/publications) (accessed 15 October 2011)
- Van Koppen, B. and Smits, S. 2011. Multiple Use water Services Scoping Study Synthesis. Draft report. Pretoria: International Water Management Institute, International Water and Sanitation Center IRC and Rockefeller Foundation.
- Verma, S. 2011. MG-NREGA assets and rural water security: Synthesis of field studies in Bihar, Gujarat, Kerala and Rajasthan. Anand: International Water Management Institute.
- Venot, J.P.; Andreini, M. and Pinkstaff, C.B. 2011. Planning and corrupting water resources development: The case of small reservoirs in Ghana. *Water Alternatives* 4(3): 399-423.
- World Bank. 2007. *World Development Report 2008*. Washington, DC: The World Bank.

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