

COMO AS RELAÇÕES ENTRE SERVIÇOS TÉCNICOS, SECTOR PRIVADO E COMUNIDADES IMPACTAM A EQUIDADE SOCIAL E TERRITORIAL DAS INTERVENÇÕES PÚBLICAS: EXEMPLO DO PROGRAMA PRONASAR NO DISTRITO SEMI-ÁRIDO DE MABALANE (GAZA).

HOW INTERACTIONS BETWEEN TECHNICAL SERVICES, THE PRIVATE SECTOR AND COMMUNITIES IMPACT SOCIAL AND SPATIAL EQUITY IN PUBLIC INTERVENTIONS: EXAMPLE OF THE PRONASAR PROGRAM IN THE SEMI-ARID DISTRICT OF MABALANE (GAZA)

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Introduction

Access to water is a major challenge in the upper part of the Limpopo basin in Mozambique, as there are no permanent rivers except for the Elephants River, whose flow is regulated by the Massingir Dam. Even the Limpopo River can dry up between October and December due to upstream uptake and international management. In the opinions of the technicians, the seven districts of the semi-arid part of the Limpopo basin – from the Gaza and Inhambane province - are among the worst Mozambican districts for borehole development because of the great depth of the groundwater, the high risk of obtaining salty water and high drilling costs (MOPH/DNA, 2009). With an average borehole cost of US\$23 810, drilling in the Gaza province is 200% above the national average (Zita & Naafs, 2012).

To boost rural water coverage at national level, the National Directorate of Water [*DNA Direcção Nacional de Águas*] has adopted the demand-response approach which is currently recommended for rural water supplies in many developing countries (Jiménez & Pérez-Foguet, 2010). The aim of the rural water sector was to shift from the traditional focus on building new facilities to setting up institutional and management structures that are able to maintain the facilities and ensure a long-term water supply. The main instrument was implementation of the National Rural Water Supply and Sanitation Program (NRWSSP), or PRONASAR (*Programa Nacional de Abastecimento de Água e Saneamento Rural*), which was launched in 2010. The program defines itself as “*the framework for operationalizing and implementing the Rural Water Supply and Sanitation Strategic Plan (PESA-ASR) 2006-2015 to reach the Millennium Development Goal of 70% coverage for rural water supply and 50% coverage for rural sanitation at national level, respectively*”. This implies the provision of 17 000 new or rehabilitated water points and 151 small rural systems – or motorized water system including treatment and taps - (MOPH/DNA 2009)

The PRONASAR program follows the Paris Declaration on Aid Effectiveness (2005). This declaration recommends helping the governments of developing countries to formulate and implement their own national development plans, according to their own national priorities, using, wherever possible,

their own planning and implementation systems. In Mozambique a number of donors (Canada, the Netherlands, UNICEF, Switzerland, the UK and the African Development Bank) created a common fund for rural water supply and sanitation. The program has four components (1) Support for a sustainable increase in rural water supply and sanitation coverage; (2) Development of appropriate technologies and management models for the Rural Water and Sanitation sub-sector (RWSS); (3) Capacity building and human resource development in the RWSS; (4) Support for decentralized planning, management, monitoring and financing of RWSS, with a focus on *“inclusive, bottom-up planning, improving the accuracy, completeness and communication of information for planning, budgeting and managing rural water and sanitation”*. In particular, the districts were nominated as the focal point for planning, implementation and monitoring of the Program (drilling and *“Participation and Community Education”* or PEC), while the provincial level was made responsible for drawing up and managing most contracts. The program also emphasizes the sustainability of water infrastructure through the direct involvement of the communities concerned, capacity building, institutional development, as well as the development of value chains for spare parts. In addition to correcting the discrepancies in water coverage between districts and provinces it also aimed to build capacity in the WASH (Water Sanitation and Hygiene promotion) sector at local level.

The program also promotes complementary cross-cutting approaches such as poverty alleviation, good governance and gender equity. It thus explicitly includes a participatory dimension and aims to facilitate the inclusion of the most vulnerable groups. Monitoring is based on indicators related to poverty alleviation such as the incidence of poverty in a village (estimated by the % of poor households), the percentage of water sources maintained by communities with pro-poor management rules and regulations, and the percentage of poor areas and households with access to water and sanitation. The pro-poor approach also includes the prioritization of districts and district areas with low coverage and high poverty. The active participation of women is also promoted. Other recommendations mention the need to use participatory district planning methods and to involve the consultative councils as well as the traditional systems of social support to reach the most vulnerable groups (MOPH/DNA 2009). Concomitantly with the development of the program, the national norms defining quality of service were redefined: in rural area, adequate service is now defined as a *“protected dug well equipped with a hand pump, serving 300 people (about 60 families) within a 500 meter radius (including 30 minutes’ walk back and forth and queuing time)”*, whereas the norm used to be 500 people (around 100 households) for each water point used. The level of salinity of potable water should not exceed 2500 $\mu\text{S}/\text{cm}$ (Pendly & Obiols, 2013).

The PRONASAR program is thus fully aligned with the strategic orientation defined by the PARPs: It supports administrative de-concentration/decentralization by strengthening the role of provincial and district government and explicitly addresses poverty alleviation through the development of infrastructures. To what extent does it succeed in addressing social and territorial inequality related to water access? The aim of this study was to investigate how the modalities of implementation of the program, particularly the interactions between the main actors, have impacted the outcomes of the program in terms of social and territorial equity in access to water. We argue that although the program enabled a real increase in the number of small water infrastructures (SWI) - an important outcome in this water deprived area - the strategies and the pattern of relationships between the main actors (technicians belonging to the provincial and district administration, the consulting firms in charge of drilling boreholes, drilling supervision, and PEC, as well as community leaders and water users) to face the challenges that prevail in the area led to tensions that could jeopardize the

sustainability of the infrastructure. Our analysis underlines the need to better account for the relationship patterns that shape local implementation pathways, as well as the need to focus as much on the quality of the implementation process as on the technical and economic efficiency of the program.

Methodology

Water access in Mabalane district, Northern Gaza province

This study was conducted in the district of Mabalane, one of the five districts of the Gaza Province selected for the pilot phase of the PRONASAR where 30 boreholes were scheduled for a three year period (2011-2013). Mabalane is a little populated and mostly agro-pastoral district located in the Upper Limpopo basin in Mozambique. The 5,400 families in the district belong to three administrative posts (APs): Mabalane-Sede (42%), Combomune (30%) and Ntlavene (28%) of the population. Each AP is divided into localities that group different villages and communities. Two thirds of the communities and population are located in the riverine area along the Limpopo river. The left side of the river is part of the buffer zone of the Limpopo National Park (LNP).

With 72% of its population living below the poverty line, according to official ranking based on nutrition, food security and access to public good indicators, Mabalane is part of the 4th quartile of the poorest districts of Mozambique. It is also the third most problematic district of the Gaza province in terms of the nutrition index, with chronic malnutrition higher than the national average. The poverty situation is better in the southern part of the district (55% of poverty in Mabalane-Sede AP) but is 80% in Combomune and 88% in Ntlavene APs (PEDD Mabalane, 2010).

Access and transport are really problematic: although the southern part of the district is only 50 kilometers away from the Macarettane bridge (and the Chókwè paved road), in 2012, none of the 439 km network of district roads was paved, and until November 2013, the closest gas station was in Chókwè, 100 kilometers away. Although the situation is expected to improve when the road to the Zimbabwe border is finished in 2015, the LNP buffer zone is currently only directly accessible by car from the district center three months a year or via a 300 km detour (two thirds of which are not paved).

The district can be divided into different areas based on their geo-hydromorphology, accessibility, distance to the main market, and institutional organization. In this paper, we distinguish between (1) the two rural centers of Mabalane-Sede (the administrative center of the district) and Combomune-Estação, located on the main road and railroad track that runs some 10 to 25 km away from the river. Both rural centers still play an important role in operating the railroad connecting Maputo to the Zimbabwe border; (2) the riverine villages on the right margin of the Limpopo River that have access to the river water and alluvial river terraces; (3) riverine villages on the left margin of the buffer zone of the LNP, which are constrained by LNP regulations and access issues; and (4) the villages on the plateau, which have no access to superficial water. All the water bodies in this area have an ephemeral regime that enables a few small reservoirs to be filled, but none are permanent.

There are three main sources of water in the district: the Limpopo river and its alluvial waters (during the dry season), which are accessible to riverine communities; the water stored in the small temporary reservoirs; groundwater, whose access is restricted since the water table is generally very deep (between 50 m and 80 m) and which is of poor quality for geological reasons (CSIR, 2003; FAO,

2004). Prior to the PRONASAR project, the district claimed 56 boreholes, 15 small water systems (SWS) that pumped groundwater or surface water from the River Limpopo, and 17 small temporary reservoirs. Officially, 25% of the boreholes were not operational, i.e. more than the 20% national average (MOPH/DNA, 2013; Munguambe & Langa de Jesus, 2011). The actual number of functioning water points is subject to debate: during a partial census undertaken in 2012 in the riverine villages in the right margin area, 12 out of the 36 water points (WP) were found to be out of order (33%) while internal documents belonging to the District Service for Planning and Infrastructure or SDPI (*Serviço Distrital de Planeamento e Infraestruturas*) – in charge of water and sanitation at district level - reported 31% of non-functioning boreholes;

Most of these boreholes and SWS were created in the last 15 years as part of projects and interventions managed by different NGOs (World Relief, LWF, CARITAS and PROMUJE), either as post war reintegration operations and/or post-flood or drought relief support. Although each NGO had its own strategy in terms of community mobilization and organization, most included the creation of a water committee and the payment of a water fee for the maintenance of the WP. In all the villages we visited, a water committee still existed although its composition varied from one village to the other. Generally, one inhabitant of the village was also in charge of the regular maintenance of the hand pump.

An approach combining qualitative public policy analysis with a quantitative survey at village level

We used a three-step approach to analyze the way the PRONASAR program was being implemented: We first characterized the institutional framework through a review of the literature and interviews key national actors. We then investigated local implementation using a public policy analysis (PPA) approach, to identify and analyze the gap between the official declarations and what was really happening, as evidenced by the actors' practices. PPA makes it possible to describe the "*state at work*" or the "*politics from below*" and focuses on different levels of governance. This is critical in developing countries where the influence of international norms is high. It emphasizes the need to consider the broader context both historically and horizontally (interactions across policy sectors) and vertically (multi-level interactions). It analyzes the different formal *and* informal institutional and policy arrangements around which both public and non-public actors interacted in the implementation of the program as well as some unexpected interactions between different policy sectors.

To this end, we interviewed different members of the district government and administration (administrator, district permanent secretary, administrative staff and some local post chiefs) as well as the head of district services (water, planning, social services, agriculture) and district, provincial and national technicians. Between November and December 2012, we investigated water use, access to water and water management in 12 communities in the different areas of the district. The village survey included (i) an interview with leaders; (ii) focus groups with water committee members; (iii) focus groups with women in two villages; (iv) a transect walk and a visit to village SWI accompanied by member(s) of the water committee. We also conducted a quantitative survey comprising a total of 119 interviews in three of these villages to analyze water use and the local perception of access to water and of how the water committee functioned.

The villages to visit were selected using information on water points and population that was available at district level. There were some discrepancies in the names of villages and communities as well as in the number of households per community in the different district documents. The number of households of a couple of communities could not be found in the document we consulted. We used SDPI quantitative data to analyze PRONASAR achievements but we did not have access to the final PRONASAR database (which was not yet available at the time we conducted our field surveys). Field work enabled us to identify some errors in the SDPI data concerning the number of operational boreholes and/or the number of families in one or two of the villages we visited, most likely due to confusion in the names of the villages or differences in the statements made by the leaders. The errors were corrected whenever possible.

Results

An improvement in access to water but difficulties still remain in a challenging hydrogeological context

The drilling of 30 boreholes and rehabilitation of seven others represents a 52% increase in functioning WPs in the district, a significant outcome in this water deprived district. According to the SDPI data, the number of households supplied by each water point decreased from an average of 256 households per operational water point (Op WP) to 133 households/Op WP except in Mabalane-Sede where the contractor was unable to finish a small water system in the time frame specified for the intervention (Table 1). Thus although, according to the national definition of water access, the situation has improved, the number of households to use one well is still considerably higher than the national standard for good service. With more than 300 households/Op WP, the situation of the two *vilas* (or rural centers) is in even worse than that of rural villages. The villages located in the LNP buffer zone appeared to be less well supplied than villages in other areas, while villages located in plateau areas villages were generally better supplied than others.

TABLE 1: CHANGES IN SOME WATER ACCESS INDICATORS IN MABALANE

	Prior to PRONASAR intervention		Post PRONASAR intervention			
	% households /op wp	% op wp / village	Nb op Wp	% op wp / total	% households /op wp	% op wp / village
Vilas*	1 120	1,0	7	9%	320	3,5
Villages near the river	167	1,0	17	21%	118	1,4
Other river villages	203	1,1	19	23%	96	2,4
Villages on the plateau	158	0,5	21	26%	83	1,0
Villages in buffer zone	368	0,4	17	21%	173	0,8
TOTAL	256	0,7	81	100%	133	1,3

* Mabalane-sede and Combumume-Estação. **wp: water points (boreholes, small water systems) not including reservoirs and wells; op wp: operational water points"
source: CPWF study using Mabalane PRONASAR data,

Comparison with the situation prior to the intervention showed that PRONASAR had led to partial improvement of previous spatial inequalities. This improvement was particularly noticeable in the villages located in the northern part of the district (Combomune AP) where 50% of the new boreholes were drilled.

Access to water access was indeed clearly inequitable prior to the intervention (Table 1). There was no operational water system in Mabalane-Sede and five small-systems in the other railroad *vila* (Combumune-Estação). Villages located on the right margin in the surrounding of Mabalane-Sede or in the southern part of the district (closer to the paved road and city center of Chókwè) were better equipped than villages located in other areas particularly those in the plateau area or in the PNL buffer zone. These data confirmed the overall impression we had of inequitable development when we visited the district with more developed riverine villages in the southern part of the district.

The initial unequal distribution of water points in the district resulted from the traditional mechanisms of village selection for interventions, which were based on ease of access and/or interference by politicians.

Like in other countries (Booth & Cammack, 2013), the functioning of state services has been shaped by external aid and projects. For example, in PRONASAR, newly purchased project automobiles were mostly allocated to the department chief and only made available for field work when there were no other priorities. While field stipends encouraged agents to undertake field and monitoring activities, the bad state of the road, the distance and logistical challenges make it difficult to cover the territory equally. Although some areas, such as the PNL buffer zone, are clearly far more difficult to reach and develop, state agents often used poor access as an excuse to avoid trying to visit these areas especially when little time was available for the visit, as underlined in different reports. The preference for proximity was not only a matter of ease of access but also the consequence of normal social functioning. Technicians who are located in the main *vilas* naturally develop stronger social ties in the area in which they live and may be tempted to prefer their connections. For example, it was obvious that the residents of the *vilas* of Mabalane and Combomune Estação had been favored by the technical services in the post-flood seed distribution scheme (Ducrot, 2013).

Ease of access was also a key determinant in the selection of the villages visited by high level politicians (provincial or national representatives) (*comicio popular*) or representatives of donors who have little time to devote to every area they visit. Consequently villages located near the paved road (in the southern part of the district for Mabalane) or close to the district center, were the target of more of these kinds of visits than average. During these visits, promises were often made, which the district government attempted to keep. The interaction between these mechanisms created a vicious circle of investments in certain communities to the detriment of others, while the investments justified further visits to the same “pilot” sites.

This vicious circle is perpetrated by a project functioning that stresses the need for outcomes in a short term project timeframe, as these outcomes are measured by concrete indicators (the number of boreholes drilled or water committees created in a two to three year project, for example). To be sure they would be able to achieve these objectives, the technicians told us they often favored area, villages, or populations where success would be easy to achieve, although they tried to balance this choice with the choice of one or two more difficult targets. In the case of the PRONASAR intervention, we did not hear a coherent record of how the initial selection of districts was made; but all the narratives agreed that the initial selection of districts did not include the most distant and challenging districts of the Upper Limpopo area and that a new selection was done later on. Even so, a couple of more? easily? accessible districts were intentionally kept in the portfolio to be sure to be able to show results at the end of the pilot phase (source: interview with *Provincial DPOH agent*).

It is only fair to point out that in recent years, the district government has been striving to promote more balanced development by encouraging NGO projects or external interventions in the underdeveloped areas of the district, particularly in the PNL buffer zone. PRONASAR data shows that adjustments have indeed been made. Yet these encouraging statistics mask two main difficulties.

The first difficulty is that some villages still do not have access to safe water whereas other villages appear to be very well supplied (Table2).

TABLE 2: PERCENTAGE OF VILLAGES AND HOUSEHOLDS LACKING ACCESS TO WATER BY AP

AP Locality	Nb com	Total nb house- hold (HH)	Com. without op wp	nb of HH without op wp	% com. without op wp	% HH without op wp
Mabalane sede						
Vila	1	1374	0			
Rural Mabalane (plateau and riverine)	4	315	4	315*	100%	100%
Nhatimba (plateau)	11	781	5	227***	45%	29% #
Tsocate (south riverine)	8	1690	2	35*	25%	2% #
Combumune						
vila	1	1180	0		0%	
Com. Estação rural (Plateau area)	9	955	3	332	33%	35%
Comb rio (riverine area)	14	2110	2	161**	14%	8% #
Ntlavene						
Chipswane (riverine)	4	1002	0		0%	
Ntlavene (Riverine LMP buffer zone)	12	1656	5	645*	42%	39% #

*Number of households estimated using data available in district documents. The number of * indicates the number of communities where information on households was missing. # indicates that this number is probably (slightly) underestimated due to the lack of information concerning households.*

The second difficulty is the high level of salinity of many of the boreholes. Access to water in the Gaza province, especially in the northern part of the province is limited by salinity (CSIR, 2003). If the national norm had been strictly respected, only 15 of the 30 boreholes would have been drilled during the PRONASAR intervention. The average salinity of the boreholes that were drilled was 2 650 $\mu\text{S}/\text{cm}$ and the salinity level of 50% of the boreholes was above the national norm 2 500 $\mu\text{S}/\text{cm}$. This is particularly true of two Administrative Posts (Mabalane-Sede and Ntlavene). Non-saline groundwater proved easier to reach in the Combumune AP in both the villages on the plateau and along the river than in other areas. Because of the salinity problem, the district government and technicians decided to use a 5000 $\mu\text{S}/\text{cm}$ threshold instead of the 2500 $\mu\text{S}/\text{cm}$ national norm to enable 30 boreholes to be drilled.

This decision was in line with the perceptions of the users we recorded during our individual interviews. Some users would rather have access to a (slightly) saline borehole than to have no WP nearby, as this often meant sharing water with animals and drinking muddy water and/or walking 20 km to fetch drinkable water. On the other hand, the level of salinity determined both water uses and the maintenance of boreholes. In villages where different water sources were available, the population were only willing to keep the borehole operational if no other source of less saline water was identified in the vicinity. When only a saline borehole was available in the village, users who

could afford it (in terms of transport and time) preferred to fetch drinking water from the river (Ducrot, 2013).

The PRONASAR program specified that newly drilled boreholes whose salinity level was above the acceptable threshold were not to be finalized, but the contractor was paid according to the number of boreholes he equipped. In the local context, a decision not to finish a “positive” drilling point (when water was found during drilling) led to frustration, misunderstandings, and local tensions. It was all the more difficult because in some places initial tests of groundwater salinity were adequate but the level of salinity had increased a couple of weeks later which prevented the borehole from being equipped. These tensions and frustration were evidence of the communication problem between communities and technicians. They were not limited to the decision on whether or not equip boreholes, but also concerned the choice of village, the location of the borehole, and the choice of technology. To understand these tensions and their impact, we need to analyze the relationships between the main actors during the implementation process.

The different actors involved in implementation

Table 3 lists the stakeholders involved in the development and implementation of the program. As stated in the official PRONASAR document *“The National Directorate of Water (DNA) is responsible for implementing the Program at central level. The Provincial Directorates of Public Works and Housing (DPOPH), through The Department of Water and Sanitation (DAS), is responsible for implementing the Program at provincial level. At district level, district governments through the units responsible for rural water supply, sanitation, community mobilization and health promotion (or SDPI – District Service for Infrastructures) will be responsible for implementing Program activities. At local level, Community Water Supply and Sanitation Committees composed of village residents are formed and supported to assist in planning and to manage, maintain and monitor improved water supply and sanitation facilities”* (MPOH/DNA 2009). The overall design was the responsibility of a steering committee made up of representatives of donors and the Mozambican government

The actors involved in program implementation are summarized in table 3 and figure 1 below. Provincial services were in charge of the financial management of the program, procurement, monitoring and contracts. Three contractors were concerned: first the contractor in charge of drilling? who drilled the boreholes, second the contractor in charge of the social dimension of SWI development including sanitary education called ‘Participation and Community Education’ - *Participação e Educação Comunitária* (PEC) – and third, the contractor who supervised drilling. The district technical services were in charge of the overall monitoring of the intervention and of organizing coordination at local level. The supervisor in charge of monitoring and evaluation of PEC was based in a SDPI office in Mabalane, but the coordinator was based in Maputo. The PEC contractor also had a technician (called a community activist) in each Administrative Post to develop work at community level. NGOs already intervening at village level were also supposed to be coopted and mobilized to facilitate dissemination and community participation. In practice, the NGO agents we contacted did not report having been involved in any cooperation or coordination.

The program supported DPOH technical services by hiring supplementary staff for the program and a technical assistant. A technician was also contracted at district level who subsequently became a permanent member of the SDPI staff in charge of both WASH and environmental issues for the district. Other support included equipment (computers, cars and motorcycles) both at provincial and

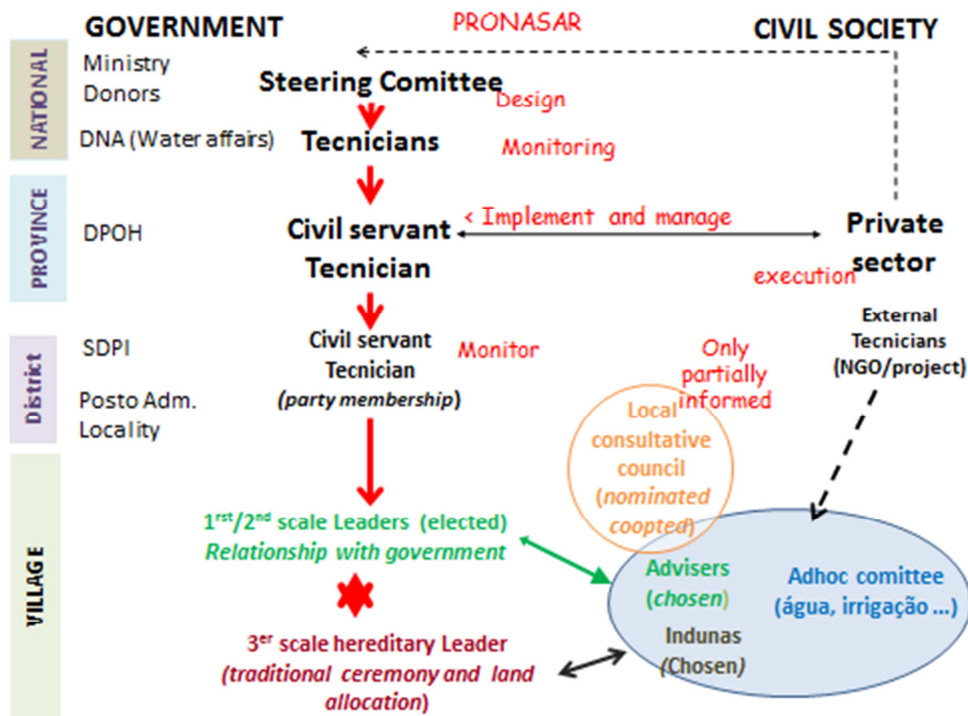
district level and training not only in technical aspects but also in administrative tasks such as contracting or fund raising using the newly implemented SISTAF software.

At community and village levels, the program called on village leaders, existing or newly created water committees, as well as the locality, administrative post and district consultative councils.

TABLE 3: ACTORS IN THE PRONASAR PROGRAM

Level	Administration	Contractor	Civil society
National	<ul style="list-style-type: none"> Steering Committee PRONASAR technicians @ DNA (including technical assistance) 	<ul style="list-style-type: none"> One contractor for Mabalane SWS 	
Provincial	<ul style="list-style-type: none"> Civil servants (DPOH) Supplementary staff Technical assistant (@ DPOH) 	<ul style="list-style-type: none"> Drilling contractor PEC contractor (coordinator based in Maputo) Work monitoring contractor 	
District	<ul style="list-style-type: none"> 1 technician who subsequently joined the SDPI staff 	<ul style="list-style-type: none"> PEC district supervisor Drilling team Monitoring team PEC technicians 	<ul style="list-style-type: none"> Consultative councils Craftsmen
Administrative Post			<ul style="list-style-type: none"> Consultative councils NGO technicians
Village			<ul style="list-style-type: none"> Water committee Village leaders

FIGURE 1: RELATIONSHIPS BETWEEN ACTORS IN THE PRONASAR PROGRAM



Local consultative councils¹ are institutionalized through the *Lei dos Orgões Locais do Estado*² (LOLE) approved in 2003 (Law 8/2003 and Decree 11/2005). By law, these councils are made up of coopted members from the state administration (health, education, and district government), organized civil society, and members of the village and local economic elite. They are to be involved in the process of drawing up and approving the district plans. They also are involved in the selection of projects that are submitted to the District Development Fund. In Mabalane, these councils are fully functional: they meet on a regular basis, holding two normal district and administrative post council meetings per year for the approval of the district annual budget and for the planning and assessment of the activities, as well as for the selection of FDD projects. A number of extraordinary council meetings are also organized, particularly at district level. The minutes of the district and AP meetings are available.

For the administration, these leaders represent the communities and form the link between the communities and the administration. At local level, the administration is represented by a civil servant appointed by the government or “chief of a locality” (*Chefe de Localidade*). The chief resides in a village in a locality that “controls” various communities. All the communities in a locality elect a “1st level leader” (*líder de primeiro escalão*) to represent them at the level of the locality. At the village or community level, a 2nd level leader is elected to represent the population of the village. New elections can be held if the leaders choose to resign (to migrate for example) or if they die, but no regular reelections are held. The communities also have a traditional leader who inherits his responsibilities and is in charge of traditional ceremonies and land allocation. He generally holds the title of 3rd level leader (*líder de terceiro escalão*). Each leader has his own team of advisors. Other people with responsibility in the village include the block and sub-block chief- whose function used to be linked with the party - and the community police. The Frelimo party also has its own local representation and membership. Ad hoc committees are sometimes created to manage certain types of infrastructure such as boreholes or irrigation scheme usually in response to a request from external actors such as NGOs. This is the case of the water committees in charge of the management of WP, which includes maintenance and the collection of water fees.

Actors’ relationships and program development and implementation

The relationships between provincial and district technical services

For most state agents, both provincial and district, the objectives of the program were limited to its bureaucratic or administrative dimensions such as providing equipment (computers, cars etc.), as well as funds for administration and training. This contribution should not be overlooked since the annual SDPI budget – including all activities, i.e. roads, transport, water and sanitation but not including salaries - was less than US\$11 500 (Mabalane Pesod 2012). The information we gathered in interviews underlined the fact that provincial staff were operational and that effective learning concerning contract management did take place. But in general, administrative personnel showed little change in their attitude and mainly emphasized the need to respect the terms of the contract and the overall hierarchical relationships between the technical services.

¹ Different names in Portuguese: *Conselhos Locais* (Local Councils), *Conselhos Consultativos* (Consultative Councils), *Instituições de Participação e Consulta Comunitária* (Institutions for Community Participation and Consultation)

² Law on Local State Bodies

District level staff were mostly involved in monitoring the work carried out by the contractors. They did not contribute to the definition of the contracts and their ability to adapt the intervention to the local context was limited, except for accepting a new salinity threshold. Logically they tended to focus more on respecting the indicators (number of committees formed or number of meetings held etc.) rather than on the philosophy behind the program. Information was perceived as a demand from the provincial (or national) level, not as a basis for their daily work and/or decision making. For example, it is remarkable that none of the many indicators collected by the PEC contractor in the communities was available at district level and when they were available, they included errors. Thus if the program reinforced the provincial level, it also reinforced the hierarchy between the provincial and district levels.

The relationships between contractors and technical services

Project implementation relied on contractual relationships between the provincial administration and private contractors. To ensure technical and economic efficiency, contractors are paid based on their achievements measured using clear quantitative indicators: the number of equipped boreholes for the drilling contractors and indicators such as the percentage of water committees established for the management of newly created boreholes or the percentage of pre-existing water committees revitalized and active in relation with the PEC contractors. This contractual relationship strictly limited any possible adaptation or flexibility, which proved to be a problem as the challenging local specificities had not been taken into account in the design of the contract. In addition, the contractual relationships between the administration and two main contractors turned out to be conflictual.

The first drilling contractor selected appeared to have underestimated the challenges of boreholes drilling in Mabalane due to difficult access and logistical and hydrogeological problems. In the first year, he only managed to drill three boreholes (none of which had been equipped by the end of the first year). His contract was consequently revoked and a new contractor selected (a Chinese consulting firm). The contractor of the Mabalane-Sede SWS was faced with the same kinds of difficulties and after two years without significant advances, his contract was rescinded in 2013 and the same Chinese engineering firm was selected to finish the work that had begun two years earlier. There were also delays in the finalization and operationalization of the PEC contract for reasons that remain unclear, meaning that work starting extremely slowly and there was little coordination between the drilling and the PEC contractors. This lack of coordination made it easy for the contractors to focus on their individual agenda. The technically efficient Chinese firm was interested in finishing the job as rapidly as possible for two reasons: they were supposed to do a job in two years that was initially scheduled over a period of three years. They also wanted to free up the equipment being used in Mabalane as rapidly as possible to complete another contractual engagement. Consequently the social intervention in the field was not satisfactorily synchronized with the technical dimension of the program, which increased the communication problems and hence the communities' frustration.

Conflicts between the administration and infrastructure contractors are common in Mozambique and are frequently reported in the media and in reports (CIP, 2009; CIP & LMDH, 2011, 2012). It is not rare for contractors to be prosecuted for failure to fulfil their contract: for example the DPOH is currently prosecuting a contractor for failing to respect technical norms in the rehabilitation of a

reservoir in Mabalane. The difficulties are exacerbated in districts like Mabalane where difficult access, distance and logistic challenges increase intrinsic technical difficulties (in this case hydrogeology). An engineering firm needs a solid logistic and financial background to be able to overcome such difficulties. But the problems were not only due to unsatisfactory selection of contractors: The very first PRONASAR contract had to be cancelled due to the inexperience of the provincial team who dealt with the contract, which led to administrative irregularities.

Monitoring the intervention emphasized efficiency by focusing on measurable quantitative indicators. However, although such indicators are important in monitoring progress during the implementation phase, they do not account for the quality of the participatory work undertaken or for the long term service delivery (e.g. reliability and continuity of water services) (Lockwood & Smits, 2011). Our field visits revealed that participatory activities were often only superficial and that the indicators did not account for the real situation at village level. It was difficult for the PRONASAR SDPI technician in charge of all issues related to water, sanitation, and the environment in the district, to be available to supervise the works undertaken by the PEC contractors while at the same time fulfilling his different administrative duties and responding to requests from the district and visitors (including for the present study!) and the technical work received most of his attention.

The relationships between technical actors and communities

On paper, the relationships between the technical actors and the communities were straightforward: The community selection procedure assumed the formalization of a request by a community that would include the selection of *“priority areas, show a clear communities’ willingness and capacity to participate and contribute to the improvement of their water and sanitation service including up-front contribution in cash or in kind, formation of a water and sanitation committee, payment of full operation and maintenance costs”* (MPOH/DNA 2009). Selection was to be based on a ‘first come first served’ basis. The PEC contractor was in charge of organizing community mobilization, requests, and the water committee. The contractor was also in charge of transmitting the approved request to the technical contractor. The community was then expected to suggest and clear three possible sites where the technical contractor could explore water availability. Community selection was not clear: On one hand the procedure recommended the selection of priority areas using indicators, but it also required coordination with local government and community request.

In practice, the communities’ selection procedure used an approach that was more appropriate for the local context. The district government decided to allocate an equal number of boreholes in each Administrative Post (10 per post): post consultative councils were in charge of selecting villages in each post. The councils’ minutes included a report on this initial consultation. The decision was based on local knowledge and perceptions concerning water shortage either because of the lack of equipment or the level of salinity of existing water points. This selection procedure matched the community’s preference for equity that tends to favor a “blanket approach” i.e. equal access to an intervention on one hand, while allowing some room to favor interventions in specific well-defined targeted populations (in this case villages that lacked water) (Ducrot, 2013).

Yet in many communities, particularly in Mabalane Administrative Post, it proved difficult to find water at depths of less than 100 m or non-saline water, even when the technicians decided not to stick to the national salinity threshold. In some cases, the three locations selected by communities were useless because no water could be found, either because of groundwater depth or because

salinity was too high. If possible, the drilling firm would then explore other sites, some of which were refused by the community for different reasons, for example, the site was too far from the village, subject to flooding, or in the middle of a main access route. In some sites, water proved to be above the acceptable threshold and the borehole was not equipped.

Technicians acknowledged that small reservoirs combined with small water systems were probably better suited to the local situation than boreholes. But, logically, they focused on completing the existing contract rather than pushing for an uncertain technical review of the program. They were all the more anxious to finalize the contract because a project for the construction of reservoirs and 20 cisterns in the district had been cancelled in 2012. In their opinion, the PRONASAR intervention was a unique opportunity to drill a large number of boreholes in the context of a severe water crisis. This matched the drilling contractor's desire to complete the contract, as he was paid on the basis of equipped boreholes.

It was thus necessary to change the drilling sites. Communities or councils were not consulted at this stage and the decision to change a site was a technical decision involving at the most SDPI, district government and the contractors (in particular the supervisor). But it is unclear to what extent the decision was a collective one: information we collected in interviews underlined the fact that the efficient Chinese firm was pushing to get the district government to provide new drilling sites as rapidly as possible so the firm could complete their contract as rapidly as possible. Villages where the likelihood of failure was higher may have been purposely or indirectly left aside. Our field visits revealed that in some villages, only one site had been explored (instead of three sites, as specified) and that the contractor would never come back for further investigation as he had told the villagers he would. Whereas some distant villages were only visited once by the contractor once, closer villages were visited several times sometimes until a satisfactory site was found, but it was not clear to us whether district technicians and the local government were involved in the decision. The few villages whose leaders had submitted a formal complaint to the district service were also more likely to be visited again. In any case, many villages were not informed that they had been selected and consequently did not have time to reach agreement on possible sites. This occasionally led to more disagreement concerning selection of a site. For example, in Combomune-Estação, one borehole was drilled in a private plot without consulting the absent landowner, with the risk of privatization of the borehole.

As the end of the contract end approached, technicians and the district government decided to focus on the plateau area of the Combumune AP, where non saline groundwater had proved easier to access. The consultative councils were not involved in this second selection phase and some of their members were very critical of the sites or technologies selected: the program had opened space to test alternative hand pumps "*suitable for varying depths and water quality*". But this was decided contractually and thus inflexible. The Mabalane contract specified that five of the 30 boreholes should be equipped with an Afripump type of pump. These pumps proved to be unsuitable for local situations: in Combumune-Estação four women would be needed to make the pump work because of its great depth. Although the number of boreholes in the Vila had increased, the population resented the situation. This mode of decision making also hampered the mobilization of the communities and jeopardized the second dimension of the program, which dealt with sanitation, as sanitation was considered by most communities to be of little importance and was only accepted as a way of obtaining access to water .

Finally, although the formal program requirements were respected, such as the need for a letter of request from the community formalizing their involvement in SWI maintenance, most of the request letters were regularized after drilling was completed. What had been considered as a key condition for local sustainability turned out to be a mere administrative and bureaucratic formality.

Relationships within the communities around the newly drilled boreholes

As part of the focus on restructuring the maintenance model, the PRONASAR program encouraged the creation of water committees. The PRONASAR document emphasizes two aspects: a participatory approach to mobilize the community and create a maintenance structure at the village level, and the training of the newly formed or “re-dynamized” water committee.

In the villages we visited, the community responsibility for SWI management and maintenance was never challenged and maintenance was generally considered to be a local problem. All the villages that had an operational water point had a water committee, although membership did not follow a specific pattern. The discourse of the PEC contractor focused on the adaptation of governance to the situation of the community, but in practice the contractor imposed a particular model. This model focused on the structure of the water committee – that is, providing a list of names of people to fulfil the different functions - under the assumption that a fully staffed committee would reduce the risk of money being mismanaged. Only the monthly water fee options were discussed, even if recent studies have shown that there is no relation between maintenance and the type of contribution (Batchelor, McKemey, & Scott, 2000).

Yet our survey of households in three villages did not reveal any major transparency issues. Even if problems of transparency and conflict concerning the management of water fees were mentioned in a couple of other villages, 87% of the people we interviewed knew how the money was used and 84% approved its use. When conflicts were mentioned in the other villages, they were mostly linked to other internal village conflicts. An inspection of the accounts book in one village, and the household survey showed that between 55 and 60% of villagers pay their water fees on time. Proportionally, the *poorest* households paid much later than the other households: “social water tariffs” made sense in the village context. They had been introduced in some villages by the NGOs who drilled the first boreholes, but, although included on paper in the PRONASAR program, this possibility had not been discussed with the population in any of the villages we visited. In fact, it appears that none of the pro-poor clauses of the PRONASAR program have been explicitly implemented: the technicians told us that there had been no mention of this aspect during their training, in contrast to gender aspects, for example.

The survey revealed that the role of the water committee was not clear to the villagers: 38% of the respondents believed that the committee was in charge of managing the borehole, whereas 28% of respondents thought it was the community leader, and 38% thought it was someone else (the mechanics or treasurer for example). But when something went wrong in the borehole, 72% would report the problem to members of the water committee and 25% to another person in the community (not the leader), and 4% did not know to whom to report the problem. Forty three percent told us they had learnt about how the water fees were used at committee meetings, 28% at village meetings, and 33% by other means. These statistics underline the limited role played by the water committee. If the borehole had a minor problem, the person in charge of maintenance will go and try to fix it on his own, if informed. If the necessary spare part is not available locally, the

restricted water committee (the people in charge of maintenance, treasurer, secretary, and president) has to be called on to provide the necessary funds (from the borehole maintenance funds coming from water fees). If not actually involved in the decision, the leader was generally informed. If not enough money was available, the leader was in charge of calling a village meeting where a supplementary contribution would be requested. Only the village leader had the right to enforce collective work (for example the work needed to protect the borehole), impose restrictions (e.g. locking the borehole until protection is complete) or collect supplementary funds. Consequently, the satisfactory functioning of the borehole depended more on the commitment of a few key people (the mechanic and/or secretary and sometimes the president who managed the funds) than on standard recommendations concerning the functioning of the water committee.

Responsibilities and decision making varied in each village depending on the relationships between the different leaders, including their age, family ties, and the historical background. There were quite complex arrangements between inherited (traditional) leadership and elected leaders as well the respective leaders' advisors and the ad hoc committees (water committee, irrigation committee, hygiene committee etc.) created by external intervention; members of the water committee - like those of all the ad hoc committees - were usually nominated by leaders, not elected. They tended to be selected among the inner circle of the leaders' "advisers" (*Indunas*, advisers, party members, block chief) but not always. In practice, depending on the village concerned, the borders between the different responsibilities were blurred, one person could hold different titles or the title was mixed. Leaders played a key role as intermediaries between the community and the outside "world". They were in charge of disseminating (official) information, for example information concerning external interventions. The information we collected in focus groups and individual interviews revealed that project/program information was often circulated only within the first circle of committee members and leaders' advisers and not beyond, but this depended on the village, on the leader, and on the type of intervention concerned. Actions that had economic potential were particularly at risk of not being well disseminated compared to public service interventions like the development of water points. And while some leaders were accountable to their community and trusted, many acted as gate-keepers and were little trusted and even distrusted. This explained why narratives concerning water conflicts were often connected to other village conflicts and previous interventions.

Discussion

Despite the fact the program had more than one objective, at district level, the main attraction was the increase in the number of boreholes. Although monitoring and evaluation emphasized other indicators, in practice, monitoring focused on quantitative indicators for implementation outputs, a classic shortcoming of project implementation (Lockwood & Smits, 2011). But technical efficiency was associated with an implementation process that was characterized by lack of communication, and little attention was paid to governance at local level even though a specific contract was devoted to this aspect.

This gap was all the more important because the governance model promoted by the PEC contract was based on assumptions that did not match how the communities actually function. The coordination between leadership(s), the key committee members, and the village governance level

appears to us to be more important for SWI sustainability than the correct functioning of the committee. Only leaders are able to mobilize the community to collect complementary funds when such funds are needed. Thus the centrality of leadership for collective action appears to prevail over the 'Western' concept of self-help and organization (Cammack, 2012). The importance of leadership for reliable water delivery in rural water supply schemes has recently been underlined (Mesa, Tamekawa, Ezbakhe, Cuadrado, & Chan, 2014). Trust in the leadership and internal community politics are directly impacted by poorly community based intervention (Kamoto, Clarkson, Dorward, & Shepherd, 2013). Any intervention that weakened cohesiveness, for example, an intervention lacking transparency, or that reached only a very small number of villagers, amplified existing tensions, weakened coordination processes and the capacity for collective action and is consequently likely to influence SWI sustainability. This underlines the need to link water interventions with other programs.

Generally speaking, the 'consultative councils' were underused during the intervention. Although their participatory functioning is more limited than expected due to cooptation and elite capture, these councils are the closest form to democratic involvement in district management (Tvedten, Paulo, & Rosário, 2010). A better use of these councils during the elaboration and implementation phase of projects of this type could probably help to adapt it to district local specificities. In any case, it would have helped throw light on local points of view and local knowledge about key issues such as salinity, technological and local equity preferences. The main actors involved in the implementation had different views on equity perspectives: The high level technician emphasized a targeted support to the most vulnerable as proposed by the program but such an approach would have required using a complex method to identify the specific targets that was not implemented. On the other hand, technicians emphasized the need to give priority to those who could make the most of the intervention, in other words, where the expected results could be most easily achieved. The villagers themselves stressed the importance of equal access to public services and public intervention. Contractors, notably drilling contractors focused on technical efficiency. As the local councils were made up of politicians, technicians, and civil society represented by local elites, they could have been the place where the different concepts of equity were discussed so that acceptable solutions to allocate sparse resources can be found. They could also have been used to collectively decide on appropriate indicators. Indeed as a political arena, the consultative council will remain a place where power is expressed. But they will only gain strength and significance, and learn to fully carry out their role if they are given a real opportunity to participate in decision making processes that deal with their attribution.

Recent findings show that efficient solutions for the management of public goods are often '*practical hybrids*' resulting from conscious efforts by elements of the modern state to adapt to local preferences and ways of doing things (Booth, 2012). They also emphasize that '*bottom-up pressures to perform have little impact in the absence of politically-driven policy coherence and top-down discipline*' as a way to ensure the functioning of technical services go beyond the capture of aid and program rent and foster impact on the ground. In this perspective, consultative councils should not be viewed as the expression of citizens' bottom up demands but as a place where the top-down logic of Mozambican government can be confronted with local ways of doing things in order to build a response that is suited to local conditions.

The program functioning appears to have reinforced the dependence of the district technical services on the provincial administration. Although hierarchical functioning is not necessarily negative, it must leave space for coordination processes and for the crafting of local arrangements that fit local situations. Coordination between district technical services could clearly be improved. Another conclusion was that innovative ways of adapting to local situations and challenges were stalled and sometimes not even brought to the attention of provincial or national bodies. For example, when the local business community pointed to its inability to store a large number of spare parts for the water supply system, district technicians proposed that a FDD project including spare parts could be envisaged. But this proposal failed to go any further. The argument used was that FDD funds were devoted to agricultural projects. An opportunity to better articulate different policies for district development was clearly missed here.

Conclusion

In rural water supply schemes, the reliability and continuity of the service remains the main challenge as is true in the semi-arid area of northern Gaza province, adding to the challenge of extending water access in a context of difficult hydrogeological conditions. It is now widely acknowledged that this is more a governance issue than a technical one. This means that actors' interactions, social functioning and "politic from below" play a key role in the effective outcomes of SWI development. Even in a hydrogeological context that severely constrains drilling outcomes, the spatial distribution of water points resulted from compromise that had more to do with actors relationships during program implementation than with the strategic orientation of the program. The hierarchical functioning of the district government, the agendas and strategies of state agents or contractors contributed as much to the final allocation of water points as groundwater depth or salinity. The tensions and frustration that prevailed during the implementation phase should not be overlooked as they erode community social capital and may lead to unexpected difficulties in future interventions. Thus technical and economic efficiency needs to be balanced with social functioning and local politics. This underlines the need to supplement the set of existing monitoring indicators with indicators that assess how local institutions are accounted for.

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