

The privatisation of irrigation water services: New partnerships and water conflicts in the El Guerdane project, Morocco

Paper presented at the
13th World Water Congress, International Water Resources Association,
1-4 September 2008 - Montpellier, France

Annabelle Houdret
UMR G-EAU, Montpellier/ Institute for Development and Peace, Duisburg
Contact address: ahoudret@inef.uni-due.de

1. Introduction

Irrigation management is increasingly challenged by the growing water scarcity. At the same time, the trend of privatisation and liberalisation which so far mainly affected the drinking water sector slowly also concerns irrigation projects. The impacts of both evolutions on livelihoods and irrigation management might entail even violent conflicts in a near future. This paper analyses these issues using the example of a public-private partnership in Southern Morocco.

The increasing water scarcity is linked to rising water demand and still high water losses, coupled with a diminishing supply. The 2007 report of the Intergovernmental Panel on Climate Change (IPCC) furthermore confirms the impact of climate change on water resources and agriculture: decreasing precipitation, higher temperatures causing increased evaporation and more frequent extreme weather events such as floods and droughts are expected to affect many countries, especially in Africa (IPCC 2007). Besides the effects on livelihoods in rural areas and threats to food security, water scarcity also increases competition over the resource. At the same time, the liberalisation of the agricultural and water sectors, is promoted by international donor agencies mainly but not only in developing countries. The public sector is encouraged to open its domestic market to free-trade agreements, to abolish or at least considerably decrease subsidies as well as to diminish the services of public institutions in the sector. Instead, private sector involvement through different forms of delegation and partnerships is promoted. The arguments for a larger implication of the private sector in irrigation services are similar to those used to promote its involvement in drinking water supply: lacking public funds for necessary investments in infrastructure building and maintenance and the assumption that private management could increase cost efficiency and water productivity. However, many of the experiences in the drinking water sector have shown that private sector involvement implies restrictions for low income groups and does in most cases not lead to the necessary investments in infrastructure maintenance and expansion (Finger/Allouche 2002; Balanya/Brennan et al. 2005).

The essential developmental objectives of irrigated agriculture are the creation and maintenance of income and livelihood in rural areas and, consequently, the preservation of socio-economic stability. However, increasing water scarcity and public-private partnerships not taking into account certain socio-economic and ecological risks might threaten these objectives and contribute to conflicts, violence and political destabilisation. Different studies show that in the context of water scarcity the risk of conflicts is much higher at the local and domestic level than between states (Wolf 2008). However, these conflicts are not the direct result of the resource scarcity as such, but are rather linked to larger social, political and economic root causes. Research projects in the field of environmental security have confirmed that environmentally-induced conflicts are primarily related to socio-economic inequalities,

often already existing before environmental stress arises (Homer-Dixon 1991; Bächler 1994; Homer-Dixon 1999; Bächler 2002). Resource degradation might compound existing distributive inequalities and thereby contribute towards (further) marginalising certain population groups. Restricted access to land and water might therefore trigger conflicts rooted in more general disparities of power and well-being.

The present paper addresses water scarcity and public-private partnerships (PPP) in irrigation management on one side and the emergence of water conflicts on the other. The first part of the paper provides an introduction to the pilot project for a public-private partnership in irrigation management, El Guerdane, situated in Southern Morocco. The second part then focuses on the results of an extensive program of research on water conflicts conducted in the region of El Guerdane between 2005 and 2007. This work was carried out in the context of a PhD project within the French research project SIRMA (*Water Economy in Irrigation Systems of Northern Africa*) and with the support of CIRAD (*French Agricultural Research Centre for International Development*). The empirical case studies combined qualitative and quantitative methodologies and included interviews with one hundred farmers in the four communities most affected by water scarcity in the region. The ecological marginalisation of farmers, which provokes water conflicts and the aggravation of this trend by the PPP project are at the centre of the analysis presented here.

2. The case of El Guerdane

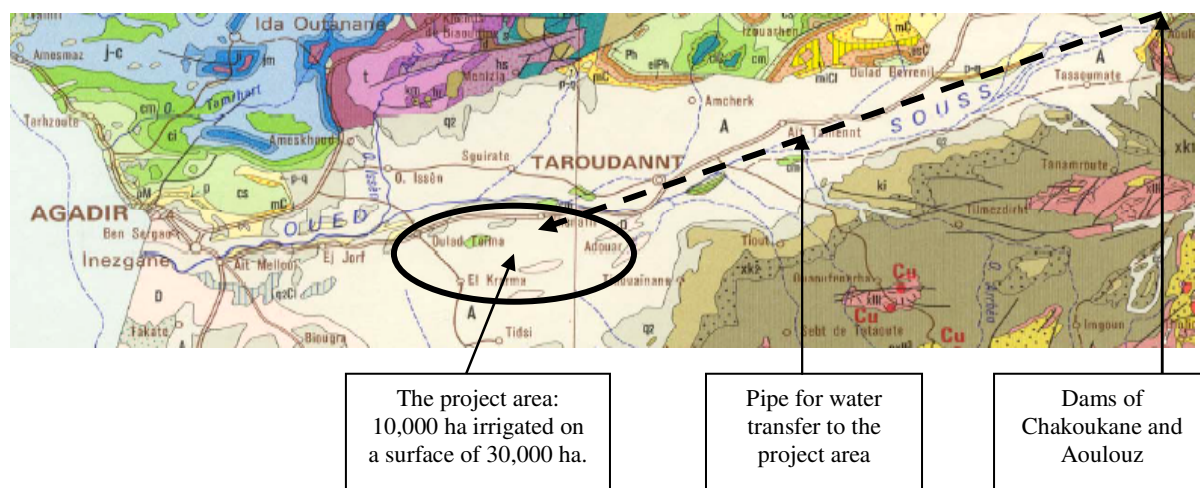
2.1 The concept of a private-public partnership in the water-scarce Souss basin

The Souss region in Southern Morocco is highly affected by water scarcity. Total water use in the basin is about 965 million cubic meters per year, and approximately 94 per cent of the water use is for irrigation. Due to the insufficient precipitations, the extensive use of groundwater for irrigation has spread all over the valley. Today, the water table is largely depleted and water withdrawal represents 179% of the renewable resources (Bzioui 2005). The depth of the aquifer has decreased at an average of 1.5m per year, since 1969, in some places up to 2m/year. Today, some tubewells pump water from more than 200m deep, whereas it was accessible at 25m in the 1960s. At the same time, the Souss valley is a strategic region for export-oriented agriculture, and produces 60% of the country's citrus fruits, contributing half of Morocco's export of these products. Insufficient water supply due to decreasing rainfall and increasing water demand as well as financial and technical problems have contributed to insufficient irrigation water supply by the public irrigation authority ORMVA. Private tubewells have quickly spread over the valley, promising secure water supply and independence from the public irrigation service. Within a few years, the phenomenon has expanded tremendously, and despite existing regulations the large number of illegal tubewells is difficult to control. The depletion of the aquifer today provokes the drying-out of wells, often used for drinking water supply, and the abandonment of what was previously arable land. By 2003, in the sector of El Guerdane alone, which constitutes only a small part of the valley, 11 953 ha of agricultural land had been abandoned (ABH-SM 2003), and it is estimated that at least 1000 ha more are abandoned yearly due to insufficient water supply (UN-Habitat 2004).

In this context, a project for saving the local citrus fruit sector has emerged. After numerous studies and different concepts for the public implementation of what became known as the "Guerdane project", it was finally decided to create a public-private partnership for the irrigation of a part of the sector. With the assistance of the World Bank's *International Finance Corporation*, the Moroccan Ministry of Agriculture formulated a delegation contract,

issued a call for proposals and concluded an agreement with the company *Amensouss*. The project aims to transfer 44 M m³ of water yearly from a dam located at a distance of 90 km. Within the Guerdane region, the water is to be distributed to some 600 farmers (see figure 1). The project area covers 10 000 ha, distributed over a surface of 30 000 ha. The build-operate-transfer (BOT) contract stipulates a 30-year management of the distribution of water and maintenance of the transfer and distribution infrastructure by the company *Amensouss*. 64% of the latter belongs to the consortium *Omnium Nord Africain* (ONA), largely owned by the royal family, 20% of it to the Moroccan public investment bank *Caisse de Dépôt et de Gestion*, 15% to the Saudi-Arabian society *InfraMan* and 1% to the French *Compagnie Nationale d'Aménagement du Bas Rhône Languedoc* (BRL). The investment costs of over 80 million Euros are supported by subsidies from one of the King's foundations (Foundation Hassan II), a loan of the same foundation to the company *Amensouss* and the company's own contribution. The irrigation system is planned to be operational from summer 2008 on.

Figure 1: The setting of the PPP-project El Guerdane (schematic representation)



2.2 Ecological marginalisation of farmers and the emergence of water conflicts

In the context of water scarcity, increased competition between water users over access to the resource has emerged in the Souss basin. Arising conflicts lead to sabotage and sometimes violent confrontation. Extensive empirical case studies on possible root causes of these water conflicts have been carried out on different kinds of ecological and socio-economic marginalisation processes affecting farmers in the region. The present paper focuses on ecological marginalisation, i.e. unequal access to land and water resources. Both resources are key factors for welfare in the region, as they allow the growing of lucrative citrus fruits, while rainfed agriculture, used for olive trees, wheat or fodder, only brings a comparatively modest income. In a second step, we examine the overlapping of ecological marginalisation with the emergence of water conflicts.

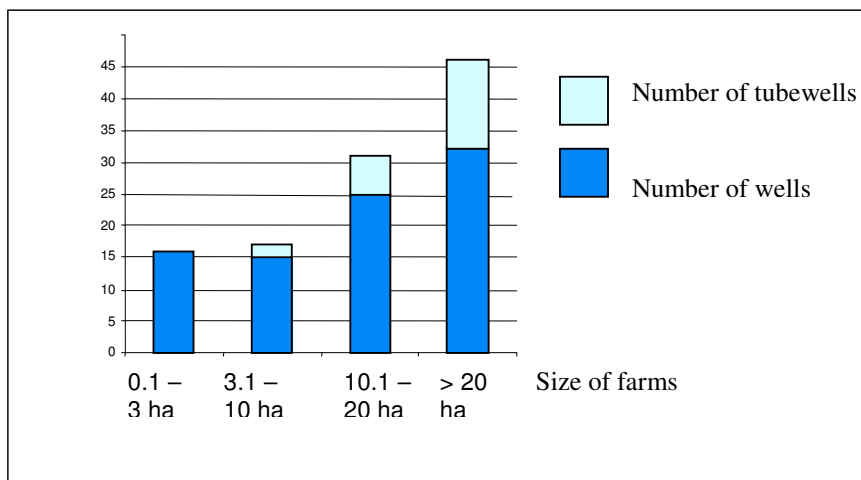
Water scarcity aggravates unequal land distribution and income disparities

Empirical evidence shows that water scarcity affects farmers very differently, depending on the size of their farm and their financial means. Farmers of all sizes of plots have experienced losses of irrigated land between 1996 and 2006. However, small-scale farmers with plots between 0.1 and 3 ha are particularly affected by the phenomenon: in 2006, they could only irrigate 64 % of the land they irrigated in 1996, while this proportion was 80% for farmers

owning more than 20 ha. Irregularly irrigated or non-irrigated but still fertile land is usually used for rainfed agriculture. Research results show that small-scale and middle-sized farmers were obliged to disproportionately extend the proportion of rainfed land and hence to shift from lucrative to less profitable cultures. In the category of farmers cultivating between 0.1 and 3 ha, 43 % of the surface was left to rainfed agriculture, while this proportion drops to 22-25% for farmers with larger plots of land.

Research on the evolution of the access to water equally shows important differences between small and large farms. While all farms were affected by sinking water levels and had lost about half of their wells since 1996, owners of larger estates could more easily compensate these losses and invest in deeper tubewells. These allowed a much more secure water supply than less deep wells, which are always endangered by declining water levels and are less performant. Even if it is evident that larger farms need more water sources than smaller plots of land, their more frequent access to boreholes indicates a different quality of water supply (see figure 2). These results confirm a trend observed in the same region by ElMahdad (2003) who concluded that owners of large lands represent only 6% of the farmers in the Souss valley but control 32% of the underground water resources. Small-scale farmers, representing 62% of all farmers but cultivating only one third of the land, dispose of barely 13% of the underground water resources.

Figure 2: The number of wells and tubewells on farms of different sizes

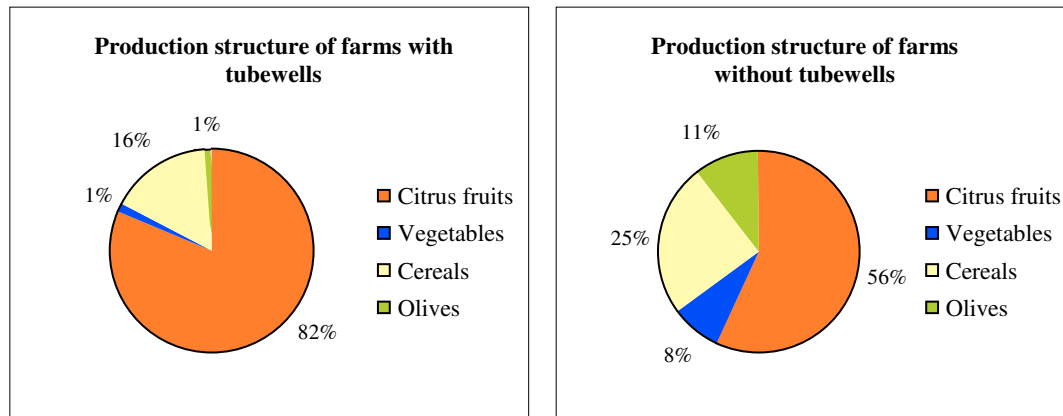


The difficult access to water for small-scale farmers results in proportionally higher losses of land, which further affects crop yields and revenues. While farmers relying on public irrigation supply or simple wells had to totally abandon or transform into rainfed agriculture over 62% of their irrigated land, those owning boreholes lost only 33%.

Citrus fruits, especially when sold to export markets, promise a considerably higher income than any product grown in rainfed agriculture. Therefore, the income from agricultural production is closely related to the capacity for growing export products. However, the field studies reveal that insufficient water supply aggravates the effects of already unequal land distribution on the farmers' income. Especially the production of citrus fruits shows these disparities: while large farms could keep their production stable or even extend it, small-scale farmers had to considerably reduce it and shift to the cultivation of mainly cereals and olives.

Figure 3 shows that farmers who do not have tubewells are much more dependent on less lucrative products than citrus fruits.

Figure 3: The production of citrus fruits on farms with and without tubewells (2006)



Besides their unfavourable access to land and water, small-scale farmers also have fewer socio-economic capacities for adapting to ecological degradation. Further results of the studies in the Souss valley that are not detailed in this paper reveal that small-scale farmers also have less access to credit and to lucrative commercialisation structures of their products. Both could facilitate adaptation to water scarcity and the search for alternative sources of income. However, the growing implication of these farmers in milk production and stock farming points to other strategies of adaptation to declining revenues from agriculture.

Marginalised farmers are more often implicated in water conflicts

The assessment of the frequency of different kinds of water conflicts poses a problem, because only a very small proportion of these conflicts are dealt with by formal institutions. Therefore, no official data exist on these conflicts. The only way to get a picture of the implication of different farmers into these conflicts was to consider their own estimation. However, the study took care to clarify the notion of conflicts beforehand, defining them as a manifest divergence of interests over water resources, which may or may not include violent behaviour. And as the conflicting parties' own perception of a conflict situation essentially determines their behaviour, their subjective assessment of the frequency of water conflicts is highly instructive. Realistic strategies for conflict prevention can only be formulated if they are also based on these perceptions, and not only on possible facts considered as "objective" for an outsider but which may not be relevant for the conflictive or cooperative behaviour of the stakeholders.

The results of the interviews show that conflicts between farmers over irrigation water are the most frequent constellation of disagreement. These conflicts might concern the allocation of surface water within or between user groups, but also the access to groundwater resources as new tubewells frequently have a negative impact on water availability of neighbouring plots. Conflicts over drinking water or those implicating the public irrigation authority happen comparatively less often. It also became obvious that farmers owning large plots of land are less implicated into water conflicts, probably because they dispose of an individual water supply through tubewells. Small-scale farmers, on the other hand, have to deal with common irrigation infrastructure, insufficient water supply by public services, or less performant wells.

Small-scale farmers are much more often implicated in water conflicts, mostly confronting the owners of large farms, accused of being responsible for the sinking water levels and diverting the resource through more efficient technology. More than 60% of small-scale farmers (0.1-3 ha) claim to be involved in a water conflict with farmers of large farms at least every month. Looking at the other point of view, in the categories of owners of larger plots (10 –20 and over 20 ha) only 36% of the interviewees are involved in these conflicts every month, most of them much less often.

Another important factor of the analysis of the frequency of conflicts is the access to water. As explained above, tubewells allow a much more secure water supply than do wells. Empirical evidence shows that 75% of the farmers who only dispose of public water supply or wells are involved at least once a month in a water conflict. The conflicts may imply violence or be expressed in a non-violent disagreement over the distribution of and access to water. On the other hand, the frequency of water conflicts for the owners of tubewells is much less: they are only implicated in disputes between one and ten times a year.

2.3 The aggravation of farmers' marginalisation through the PPP project and conflicts arising

Water scarcity and the degradation of arable land lead to enhanced competition over these resources in the Souss valley. The PPP project El Guerdane, implemented to preserve the lucrative production of citrus fruits, allows about 600 selected farmers to save at least a part of their plantations. However, the project contributes towards the further marginalization of the large majority of farmers who do not belong to the project. Two factors indicate that conflict potential might rise significantly in the context of the project implementation:

- a) The marginalisation of farmers due to high fees of the project and further restricted water availability in the project area;
- b) The restricted water supply and lacking compensations for farms located upstream.

The marginalisation of farmers due to high fees of the project and further restricted water availability

The process of selection of the project members was implemented in different stages, first by the irrigation authority and then by the operating society Amensouss. However, all the way along this process accusations of lacking transparency and information on the project and the conditions of access were brought up. The final member list has been delayed by numerous legal proceedings and a waiting list of more than 800 other farmers (in October 2007) wanting to enter the project was issued. However, even for those farmers informed about the possibility and the conditions of joining the project, a high financial barrier persisted. Each member, necessarily a cultivator of citrus fruits, has to pay inscription fees, fees for the connection to the irrigation system as well as for the water supply. Furthermore, the compulsory equipment of the fields with a system of drip irrigation is equally costly. More expenses may arise when citrus plants, which have long suffered from insufficient water supply, have to be replaced. Besides the membership, all costs are relative to the surface integrated into the project. Overall, a farmer owning a middle-sized plot of land of 15 ha, choosing a current standard for his system of drip irrigation and benefiting from the public subsidies of 60% of this equipment, still has to invest around 17 500 € for the equipment and membership in the first year and additionally around 10 000 € for the irrigation. However, as the 4 000 m³ of water per ha provided by the project do not suffice for the irrigation of the citrus fruits, he also has to finance the pumping facilities of about 2000 additional m³ of water. Besides the fact that the number of farmers joining the project is very limited due to the restricted water availability, the necessary costs for the investment and maintenance of a farm

in the project also penalise many. This contributes towards further enhancing the existing disparities between farmers.

Furthermore, for the majority of the farmers who are not members of the project, water resources will be further restricted. This is due to the still high water demand, lacking control of the depletion of underground water resources and probably low precipitations in the near future. However, these existing restrictions may be further accentuated by the PPP project. On one side, the project accentuates disparities because, as mentioned above, the 10 000 ha of irrigated land will be extended over a total surface of 30 000 ha. The proximity between well-served and lucrative farms and others hardly surviving or drying out contributes to further intensify competition over the resource and may fuel tension. On the other side, the project, in spite of the implication of the Ministry of Agriculture as well as the regional basin authority and the World Bank, does not seem to be integrated into an overall strategy for preserving water and land resources in the Souss valley. Strategies for a more sustainable management of the resource do exist and comprise measures of water economy and water recycling, as well as the prohibition of extending irrigated land. Nevertheless, the water consumption related to the Guerdane project will probably not contribute to the preservation but rather to more depletion of the resource. The transfer pipe will be able to provide only 50% of the water needed for the citrus fruit plantations in the project area. The remaining water needs to be mobilised from the already depleted underground resources, meaning that even the farmers within the project area will still rely to a large degree on tubewells. The project will therefore even increase the water use of deep aquifers and thereby further contribute to the drawdown of the water table, which already provokes significant land degradation and migration of farmers into the cities. The saving of water achieved through the use of micro-irrigation does not contribute to alleviate the resource stress as long as the water saved serves to irrigate new farms or to grow more water-consuming plantations on existing irrigated land.

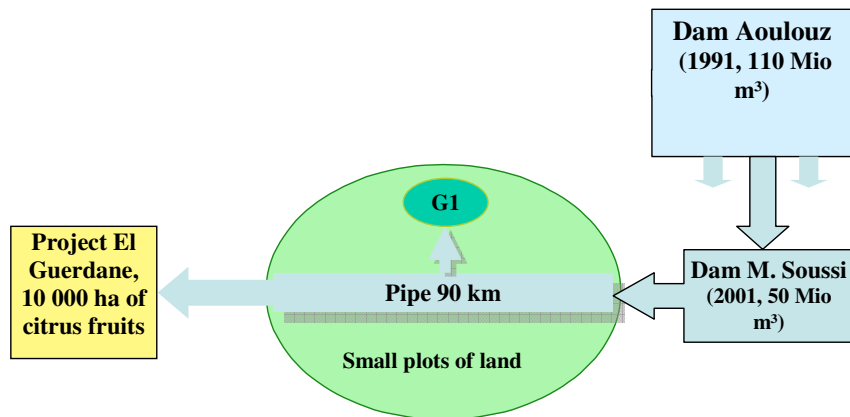
The restricted water supply and lacking compensations for farms located upstream

Another conflicting issue is the monopolisation of water resources by the Guerdane transfer and the construction of the two upstream dams of Chakoukane and Aoulouz (see figure 4). The construction of the dams has led to violent conflicts around the dam areas, as local populations were forced to resettle in other areas, and compensations for the loss of their housing or farming land was insufficient and partly non-existing. Furthermore, the water retained by the Aoulouz dam was formerly used for the irrigation of farms located upstream of the project zone of El Guerdane. Although some of the owners of these plots of land were able to register their traditional water rights in time and will now benefit from a secured supply of 17.7 million m³/year, others, because of various political and juridical reasons, were not registered. Their fields will now exclusively rely on rainwater, which, at a ratio of 280 mm/year, does often not permit small-scale-scale farmers to secure a livelihood. Consequently, the irrigation water user associations (AUEAs) in the region are not able to provide enough water to their members, and have to deal with internal conflicts over the distribution of the resource.

Another type of conflict arises from the construction of the pipe, as it implies the expropriation of land and the destruction mainly of olive trees over a large part of the 90 km. In 2007, the protest of villagers concerned by these effects blocked the company's work for three months before a preliminary agreement on eventual compensations was negotiated. Furthermore, as in the area of El Guerdane, the problem of the sinking aquifer level also enhances conflict potential in this upstream area. Financially strong landowners with boreholes of a depth of 250 m contribute to the drying-out of wells of poorer peasants or

drinking water users, which are usually not deeper than 40 to 100 m. This frequently leads to sabotage and sometimes even violence.

Figure 4: Restricted water supply for farms located upstream



3. Conclusion

This overview on the context and the effects of the PPP project El Guerdane reveals some of the important risks related to its implementation. These are of an ecological, socio-economic and financial nature. As stated at the beginning of the paper, irrigated agriculture has a key developmental function of securing livelihoods and income in often already marginalized rural areas. However, livelihoods, especially of small-scale farmers, are more than threatened in the Guerdane region because of water scarcity. In this situation, the PPP favours financially strong and politically influential farmers and contributes to exacerbating existing disparities. As it has often been the case in the drinking water sector, the private company focuses on financial benefit and cost-efficiency and is not interested in integrating low-income groups - which is to be expected within the rules of market economy. However, if the state is not capable of securing basic socio-economic and ecological standards in the context of the implementation of a PPP, its impact on social stability may be problematic.

The Guerdane project, as it is implemented today, contributes to the exacerbation of some of the root causes of water conflicts in and around the project area, and thereby triggers additional and probably fiercer disputes. Other studies on the privatisation of irrigation services equally demonstrate that the political, social and environmental objectives of irrigated agriculture cannot be reached by market forces and the supremacy of private sector interests (Merrett 2003; Hellegers/Perry 2006). Today, these objectives may be more important than ever, as irrigated agriculture can contribute to securing livelihoods and food security in the current context of increasing food deficits on the world market. Many low-income food deficit countries around the world have to shoulder a heavy financial burden in order to meet the cost of food imports. In this context, policies promoting export-oriented agriculture in countries depending on increasingly expensive imports of staple food are questionable.

Besides the ecological and socio-economic risks mentioned above, the financial risks are also an important aspect. A closer look at the contracts of the project reveals that the financial risk mostly lies with the individual farmers and the public counterpart, while benefits during the 30-year concession will flow to the operating consortium. Local water authorities estimate that the amount of water necessary for the cost-efficiency of project will be impossible to obtain, due to severe droughts and deficient rainfall in the near future. This will bring into question the preliminary investment calculations of the operator and cause economic losses. The delegation contract, as well as the contract between the company and the farmers, specify that losses in gains for the private company resulting from insufficient water supply are compensated in the following way: the private company bears the costs resulting from a

decline of water availability up to 15% of the estimated quantity available for the projects irrigation network. A decline in water availability between 15 and 22.71% will be balanced by higher prices for the irrigation water. Deficits beyond this level will be compensated by the public counterpart. The main risk in the case of water scarcity will thus be carried by the farmers and the public institutions.

The Guerdane project is presented not only within Morocco but also internationally as a promising pilot project for securing necessary investments in irrigation infrastructure. Sami Haddad, director for Middle East and North Africa at the World Bank's International Finance Cooperation states: "The success of the bidding process for the Guerdane PPP irrigation project sets a worldwide precedent for future irrigation investments in a very difficult global environment" (IFC 2004). Nevertheless, the present paper points to the risk of neglecting the ecological and the socio-economic context in which such a PPP is implemented and operates. In a setting where tension over the access to natural resources is already high and where the majority of the population is directly dependent on water for securing their livelihood, ignoring the impact of the project on these may easily lead to development problems and conflict. The retreat of state institutions from services in the agricultural and water sector is often claimed in the context of liberalisation policies. However, such a retreat does not disencumber governments from their essential task of ensuring livelihoods, living conditions and access to basic social services. Where these objectives are not met or are even neglected for the sake of the interests of an elite, and as long as no accompanying measures for compensation and income generation are implemented, political legitimacy is questioned.

References

- ABH-SM, Agence du Bassin Hydraulique du Souss Massa, 2003: Renforcement de la recharge artificielle de la nappe du Souss. Agadir.
- Bächler, Günter, 1994: Desertification and Conflict. The Marginalization of Poverty and of Environmental Conflict. Report n° 10 of the Environment and Conflicts Project (ENCOP). Zürich, Bern.
- Bächler, Günther (Ed.), 2002: Transformation of Resource Conflicts: Approaches and Instruments. Bern.
- Balanya, Belen;/Brennan, Brid;/Hoedeman, Olivier;/Kishimoto, Satoko;/Terhost, Philippe, (Eds.), 2005: Reclaiming Public Water. Achievements, Struggles and Visions from around the World. Porto Alegre.
- Bzioui, Mokhtar, 2005: Rapport sous-régional sur la mise en valeur des ressources en eau en Afrique du Nord, UN Water Africa, Rabat.
- ElMahdad, Hassan, 2003: L'Eau et l'homme dans le Souss: Contribution à l'étude d'un hydrosystème marocain (in Arabic). Agadir.
- Finger, Matthias/Allouche, Jeremy, 2002: Water privatisation Trans-national corporations and the re-regulation of the water industry. London.
- Hellegers, Petra J.G.J;/Perry, Chris J., 2006: Can irrigation water use be guided by market forces? Theory and practice, in: Water Resources Development 22(1): 79-86.
- Homer-Dixon, Thomas, 1991: On the Threshold: Environmental changes as causes of acute conflict, in: International Security 16(2): 76-116.
- Homer-Dixon, Thomas, 1999: Environment, Scarcity and Violence, Princetown.

- IFC, International Finance Corporation, 2004: IFC helps Morocco secure competitive sector bids for world's first public-private partnership irrigation project, in: <http://www.ifc.org/ifcext/pressroom/ifcpresroom.nsf/PressReleaseElGuerdane> (15.01.2007).
- IPCC, Intergovernmental Panel on Climate Change, 2007: IPCC Fourth Assessment Report. Working Group II Report "Impacts, Adaptation and Vulnerability". Geneva.
- Merett, Stephen, 2003: The urban market for farmers' water rights, in: *Irrigation and Drainage* 52(4): 319-326.
- Molle, François;/Berkoff, Jeremy (Eds), 2007: *Irrigation Water Pricing: The Gap Between Theory and Practice*. Oxfordshire/Cambridge.
- UN-Habitat, 2004: *Profil environnemental d'Agadir. Agendas 21 locaux pour la promotion de l'environnement et du développement durable en milieu urbain*. Rabat.
- Wolf, Aaron, 2008: A Long Term View of Water and Security: International Waters, National Issues, and Regional Tensions., in: *German Advisory Council on Global Change: World in Transition - Climate Change as a Security Risk*. London.