

MEGA-IRRIGATION AND NEOLIBERALISM IN POSTCOLONIAL STATES: EVOLUTION AND CRISIS IN THE GHARB PLAIN, MOROCCO

by
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ABSTRACT. This article explores the development, evolution and impacts of large-scale irrigation schemes in the formation of the postcolonial state of Morocco and in more recent neoliberal decades. In particular, the article focuses on the Gharb Plain in the Sebou River basin, which was targeted by huge investments to become the core region for national development. In this area, three stages of development – colonial, early independent, and the aggressive *politique des grandes barrages* post-1970 – have created two clearly different and successive landscapes. The traditional landscape has been overlain, and largely obliterated, by colonial and postcolonial governmental landscapes, reflected through different spatial, economic, cultural, and political patterns over time. In the present, a fourth stage of neoliberal development is occurring in the landscape, in which diffused poverty and ecosystem collapse coincide with greater concentrated wealth and the building of technological infrastructures. The article aims to complement critical studies on neoliberal environments, by focusing in particular on the manipulation, dispossession and commodification of water and land resources in irrigated agriculture in Morocco. These emerging rationalities are closely related to the changing policies of the contemporary Moroccan state.

Keywords: mega-irrigation schemes, Morocco, neoliberalism, postcolonial development, state territorialization

Introduction

The Gharb irrigation scheme is an example of mega-projects, typical of many state development policies during the past century, and of postcolonial states in the past 50 years. Considered as economic engines, their territorial impacts have largely been disregarded until recent times, when their contradictions have become more evident because of progressive state disengagement, connected to a critical economic environment.

The Gharb's history is not only significant for the exploration of the development, evolution and impacts of large-scale water schemes in the formation of the Moroccan state, as it allows exploring critical phenomena that are commonly experienced

in many postcolonial states. More specifically, it aims to contribute to the geographical debate about the importance to build environmental histories to scrutinize power relations and impacts in historically situated socio-natural settings.

The theoretical framework is situated in the political-ecology perspectives that look at society and nature as deeply intertwined, and at engineering interventions in the landscape as political acts, aiming to produce new socio-natural landscapes that are coherent with the decision-makers' strategies (Swyngedouw 1999; Robbins 2004; Minoia 2006; Heynen *et al.* 2007). The need to focus ecologically appropriate and socially just insights (Davis 2009) well integrates post-development geographies in deconstructing official, international narratives that would explain the current crisis, especially in the countries of the Global South (Escobar 1995). Studies in environmental history allow positioning specific facts of water and nature re-engineering in line with globally dominant governmentalities (McNeill 2000; also Swearingen 1988, for a Moroccan case study). Critical research on neoliberalism and its effects is also considered, in terms of changes of political, social and economic nature that are induced by external pressures, especially in developing countries, by international financial agencies (Harvey 2005; McCarthy 2007).

This work also builds upon literature that has studied impacts of neoliberal water policies (e.g. Castro 2007; Goldman 2007) and further develops a critical analysis of the water demand management approaches that are currently so popular internationally. Davis' (2006) contribution is also relevant, for the way she relates neoliberalism and agricultural restructuring policies and deconstructs declensionist colonial environmental narratives in Morocco. However, also due to the different geographical focus of this article, which is on an irrigated plain (while Davis' case is based in the rain-fed South),

territorialization and hydro-political theories have more centrality here.

As for the case study, this article will initially focus on the territorial changes superimposed on the Gharb Plain, part of the Sebou catchment area, which were pushed by planners with the intent to create a core productive region that would power the national economy and enforce the political project of the new nation-state. Second, the article will observe the impacts of the recent neoliberal developmentalism, in which the state has selectively reduced its directive role in the agricultural sector, while new trade agreements and landownership structures have led to a returning foreign presence. This governance shift has also produced relevant impacts, despite the minor engineering intervention that occurred in this phase. In fact, the new rules have contributed to a further dispossession of natural resources from the local communities and thus increased their vulnerability.

These consequences have been observed through a close contact with the studied areas and their actors, to access different sources and to record local insight. Fieldwork has been very important for this study. Visits completed between 2005 and 2008 have allowed access to a large amount of literature that is locally available on issues related to politics and water-related fields either in Morocco or the Gharb and that includes, besides books and articles, unpublished theses, newspapers, governmental reports and statistics. Visits to the Gharb Plain have allowed observation, semi-structured and unstructured conversations. A field trip and two seminars were also organized with a class of Master students in geography of the University of Rabat in 2007, as part of a course I gave as a visiting lecturer. These events allowed observation of the landscape and questions to be raised, particularly through interviews with regional technical officers working in the water and agricultural sectors in the Gharb, consultants involved in the water management reform, and local farmers, including women, whom we met in the fields and in small towns. While the experts provided local statistics that had not been published in national reports, the aim of the interviews with farmers and local residents was to gather qualitative insight into the ways certain political and management changes have been enacted in that particular context, how they have been perceived, and what personal consequences they have led to in peoples' lives (Secor 2010). A very important experience was also the discussion of the students' findings in class, to interpret experiences and meanings.

Hydraulic territorialization in postcolonial states

The territorializing nature of water infrastructures has been explored for decades (e.g. Wittfogel 1957; Hunt and Hunt 1978; Waterbury 1979), explaining the ways in which mega-engineered projects have influenced the development processes of places through the control over their human and natural resources. According to McNeill (2000, p. 150):

Churchill ... Lenin, Franklin Roosevelt, Nehru, Deng Xiaoping, and a host of lesser figures saw water in much the same way, and encouraged massive water projects in the USSR, the United States, India, and China. They did so because they all lived in an age in which states and societies regarded adjustments to nature's hydrology as a route to greater power or prosperity.

Thus the inclusion of nature in the socio-political construction allows deepening of the concept of territory over which powers exercise their own strategies (Delaney 2005). By establishing infrastructures and setting up new rules, hydraulic territorialization reflects and incorporates features of the social order that creates them. In postcolonial contexts, and particularly in the first decades of independence, this order has tended to be coherent with, and supporting of, the production of strong nation-state territorial discourses. The construction of regimes has followed the ideal model of the Keynesian welfare national state, characterized by an 'autocentric circle of mass production', although not considering the need to secure mass consumption, but 'secured through a distinctive mode of regulation that was discursively, institutionally and practically materialised' (Jessop 2002, p. 55). New infrastructural works that are functional of new production schemes and activities have been conceived by state powers as material signs for territorial control, while their symbolic power entails a significant social transformation and is often constitutive of new national identities (Turco 1988). Similar models have been performed in non-developing countries; particularly, the experience of Spain under Franco reported by Swyngedouw (2007) illustrates the linkages between nationalism and techno-natural material infrastructures in articulating a new geographical project. However, the peculiarity of the postcolonial countries resides in their limited sovereignty, which continues after the financial crisis started in the 1980s and in the internal governance

relations (Sidaway 2007), as explored later in this article.

Particularly during the first decades, the new independent states made the largest efforts in their plans of economic modernization, in which mega water-engineering projects played a great role (Showers 2011). While the first infrastructures were mainly to provide water for agriculture, to control floods and to transform allegedly unproductive areas into highly productive lands, later dams became multipurpose, also meant to produce hydroelectric energy (McNeill 2000). However, despite propaganda and rhetorical claims referring to the shared benefits of these structures for all, these infrastructures have been more attractive for potential investors rather than for local communities. The reason is that by aiming at obliterating previous livelihoods and territorialities, considered as pre-modern, such projects have commonly dispossessed local communities of their traditional rights over the natural resources, and thus created new marginalized, exploited and poverty stricken groups (World Commission on Dams 2000). Critical literature has in fact described the undemocratic nature, dubious economic benefits, and disastrous environmental consequences of mega-projects (e.g. Shiva 2002; Flyvberg *et al.* 2003). Examples of these processes have been observed in different areas of the world, such as in southern Egypt (McNeill 2000), in the Sudanese New Halfa scheme (Bertoncin *et al.* 1995) and Merowe dam (Hashim 2010), in the Tunisian Lake Ichkeul (Smart 2003), in the Turkish Great Anatolian Project (Ward 1997), in the Lesotho Highlands Water Project (Transformation Resource Centre 2000) and in the Chinese Three Gorges project (Duan and Steil 2003).

Postcolonial governments have not been the sole or even the strongest players in their own territories. The international influence over investment decisions in irrigation schemes of different countries has been remarkable during the whole twentieth century through a number of ways: first, through direct investments by enterprises of colonial origin, particularly in the early years of the decolonization processes (e.g. Waterbury 1979; Swearingen 1988); second, by an intensification of international market relations, by increased production of crops for exportation (e.g. Biccato and Faggi 1995; Akesbi 2006); lastly, by intensified international aid and financial loans, mainly channelled by the World Bank, and subjected to strict conditionalities in the field of macro-economic and institutional reforms (Harvey 2003, p. 181).

With reference to the water sector, many government institutions started disengaging from the engineering maintenance tasks, as part of wider processes of decentralization and privatization that permeated policies throughout the world, particularly from the 1980s. A situation of clear state domination over the main infrastructures and working procedures was then replaced by a situation of governance uncertainty.

Neoliberal developmentalism in irrigation

Neoliberal pressures have been moved to postcolonial countries throughout the globe. However, their application has been internalized in different ways and encountered various obstacles, particularly in states where authoritarian powers are still the main regulators. Despite clear modernization of the new public administrations, some typical features of Western neoliberal states are lacking, like the 'legal framework allowing freedom of businesses and corporations' (Harvey 2005, p. 64). For instance, Morocco's political system (*makhzen*) is based on *neopatrimonialism*, ensuring the power base to its leaders (Bicchi *et al.* 2004; Cammack 2007), and on manipulated propaganda. The deployment of neoliberal policies, supported by foreign aid, has intersected both the protection of corporate interests as well as the long declared land reform. Moreover, some critical aspects related to the agricultural sector make water privatization difficult to achieve in Africa, not least because of the low economic attractiveness of irrigation networks for private investors (McNeill 2000), particularly in the MENA region (Ahmad 2000). The scarce response of private sector companies to replace public water providers has produced fundamental gaps in the management system of irrigation schemes. Who should then take over the management of large-scale infrastructures and of the irrigation services?

Declensionist environmental narratives have blamed both farmers and public institutions for having depleted water resources and thus for their incapacity to manage them (Davis 2006). In line with these ideas, to solve irrigation mismanagement and the problems of water scarcity it has caused, whether the responsibility of public offices or farmers, a new approach came into existence, that of *water demand* management. In contrast to the *water supply* approach, typical of the previous decades in postcolonial countries and expensively applied by strong state apparatuses to construct dams and canalization

networks, the water demand management approach proposes *soft* interventions. The concept includes environmental and Malthusian concerns with respect to the exhausted resources. Solutions are sought through new water-saving regulations, considered as having lower impact than infrastructures and able to rationalize uses of available resources (FAO 2002).

However, water demand management is not a neutral response to the problems caused by bad irrigation practices, but embeds clear neoliberal principles in natural resource management. Three principles are particularly strengthened in the new policy reforms that are applied worldwide: technical *modernization*, *state disengagement* and *pricing*.

First of all, water demand management requires modernization of the irrigation networks especially to avoid water losses. The wide presence of open gravitational canal networks that were typically installed during the past decades is considered the main barrier to solve leakage, evaporation, excessive withdrawals and water stealing (Varela-Ortega and Sagardoy 2003). Technical knowledge is more appreciated than traditional knowledge, considered as obsolete, particularly if crops are meant to compete internationally. Attempts to recover traditional water tools and networks, like the *foggara* or *khattara* in Northern Africa, mainly belong to cultural projects funded by international donors on a small scale (Laureano 2001). Besides know-how, purchase of new tools and use of energy increase production costs that small farmers can hardly afford.

The second neoliberal principle, state disengagement, is connected with the rhetoric of democratization of economic and political systems. Public-private partnerships are meant to contrast the presence of strong state control over water and land resources. Contrarily to the principle of water supply management that was requiring state interventionism, the principle of demand management means to empower water users, and to respond to their real irrigation requirements. If sales of irrigation schemes are not feasible for lack of interest by external corporations, as earlier mentioned, the exit strategy for the state is to hand over the schemes to the same farmers, despite the spread idea of their inability to run the networks efficiently. These decisions are supported by international aid programmes, based on the theoretical principle that farmers are the best actors to manage carefully their

scarce resources (UNDP 2006). However, problems arise when the real stakes are not direct sources, but rather complex infrastructures and schemes that have been established and governed by centralized, authoritarian powers for so many years. The situation is worsened by the fact that the handing over has not been preceded by amelioration works in the schemes (e.g. restoration of canals, clean up from silt and weeds, or introduction of water meters to record the consumed volumes) or by a full reorganization of the irrigation cycles to allow independent crops. The reality is that obsolete giant networks are simply proposed to farmers' groups that have their lands and their living there (i.e. in Sudan, on which see Omer 2008). Finally, the entrance in new international trade agreements in an overall situation of market uncertainty has increased insecurity among the producers, since they cannot benefit from public subsidies, considered to disrupt the market competition. Consequently, the devolution of irrigation management to farmers has not empowered the majority of them; on the contrary, it has created dramatic consequences for many small producers. Wealthy landowners have increased their accumulation of land sold by the impoverished categories and have means to access alternative sources of water, if the canals are silted or infested by weeds, for instance groundwater sources through engine-powered pumps (e.g. Bertoncin *et al.* 1995; Minoia and Guglielmi 2008).

The third key element of these *soft* tools is the market pricing, which, according to an economic approach, would regulate the consumption of water (Ahmad 2000), promote conservative uses of scarce resources and alleviate losses (Oubalkace 2007). Despite various contradictions related to the application of prices to a non-marketable good (Petrella 2001; Swyngedouw 2005), pricing mechanisms have been applied in most developing countries. The shift in water management, from subsidized resources towards regimes of full-cost pricing, has a questionable economic rationale, since the introduction of new technologies increases water tariffs, thereby making water even less accessible to poor users. On this subject, and mainly on the related question of access to drinking water as a common good, there is already abundant research (e.g. Laurie 2007), while the issue of pricing of water in the irrigation sector is less addressed by geographers in development studies. Because of its relevance, I will consider this issue in the case study of Gharb.

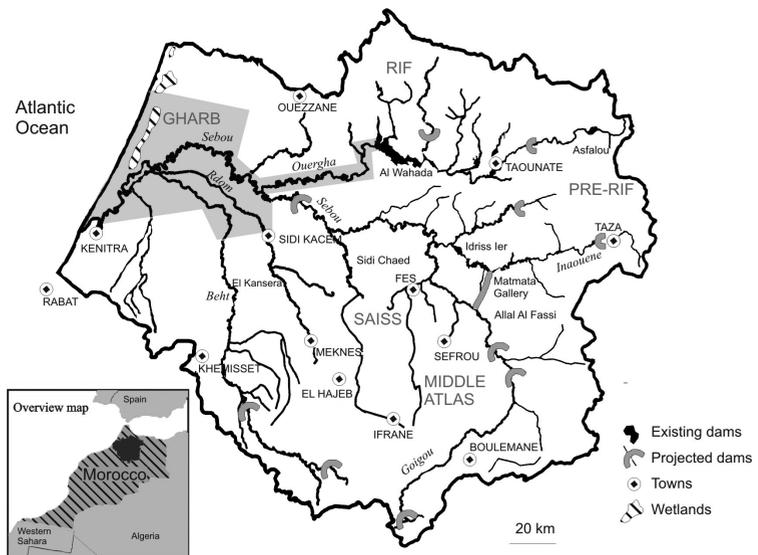


Figure 1. Sebou Basin and Gharb Plain.

Rationale of the Gharb case study

The conceptual framework exposed in the first sections will structure a narrative of the political-ecological history of the Gharb case. Political, social and natural aspects are intertwined in the production process of the nation and its physical environment, in accordance with the governmental model and the modernization culture. Through the exploration of the Gharb, I aim to present a territory that has been heavily remodelled by the postcolonial and neoliberal utopias of growth. Following a historical analysis of the main territorializing facts in this region, I will demonstrate that despite huge engineering and technological interventions, many farmers are now unable to access natural resources of sufficient quality to secure their livelihoods, and to rebuild their own territoriality.

The presentation will be developed in two sections. The first, based particularly on Swearingen's historical account (1988), will present the evolution of the region from the colonial times to the realization of the great *Projet Sebou* and some produced impacts. The second section will then focus on the current neoliberal phase, which is causing negative pressures on the environment and the local communities.

Water control and territorial changes in the Gharb Plain

The Gharb Plain is located in the lower portion of the Sebou catchment and flows across the Atlantic coastal plain (Fig. 1). In terms of water volume, it is the richest river in the country. Water control has long been the main focus of the territorial organization of the Gharb Plain and, as a result, it has deeply modified both ecosystems and human territorialities. In many ways, the history of the Gharb can be seen as a process involving different social and institutional actors, with the water-soil system as the main resource for their reproduction, empowerment and building their development assets.

Before the French Protectorate, established in 1912, the water and soil potentials of the Gharb Plain attracted nomadic communities of mainly Arabic groups as far back as the twelfth century and mixed to indigenous Amazigh tribes. Le Coz (1964) presents an in-depth description of the local communities and their territorialities before heavy state planning from the 1970s destroyed their spatial organization. Their livelihoods were based on crop and grazing depending on a flexible relation with the land, on the variability of floods, and thus, on soil humidity and composition. Their villages (*douar*) were established on elevated zones near the Sebou and the Beht rivers, protected from the flood

risks. Permanent marshes (*merja*) could not be utilized, but in spring and summer their edges were sufficiently dry to be used for livestock grazing. Muddy-sandy alluviums and hydromorphic soils were exploited by biennial rotations, which alternated cereals with pastural fallow lands. The main crops were grown in winter, with sorghum and millet cultivated in the spring and summer.

Strong patterns of territorial control only started in the twentieth century, opening an era of great physical and social changes, performed through new political systems. In the next paragraphs I will focus on the most significant historical discontinuities that occurred in the territorial management: the colonial reclamation, the postcolonial institutional setting and the *Projet Sebou*. I will analyse the current state of implementation of the management plans and their impacts, and will then focus on the pressures induced by the current neoliberal state disengagement policy.

Colonial reclamation

Soon after the establishment of the French Protectorate, the Gharb region was considered for its agricultural potential. However, to expand its production, to the extent of re-constituting the old 'Granary of Rome' (Swearingen 1988), it was considered necessary to overcome some physical obstacles: marshes and seasonal floods. In 1917, the Séjournet Plan, named after the French engineer who proposed it, designed the first hydraulic works: drainage of the central *merjas*, soil removal and the digging of canals connecting the wetlands to the Sebou and Beht rivers. No consideration was paid to the contemporary use of lands of the local tribes. A great flood in 1927 justified a re-launch of the plan and the construction of El Kansera dam (1935), the first one to be installed in the Sebou Basin.

These technical interventions were truly territorializing factors. The new infrastructures introduced spatial manoeuvre of water floods, obliterated the bases of the traditional livelihoods and were accompanied by a social reorganization, responding to the new spatial design that had given the Plain new productive functions. The first beneficiaries of the new land availability were the new settlers, who also introduced pumping from the rivers and considerably modified the agricultural techniques. Patterns of agricultural exploitation, as described by Swearingen (1988), served the European market's demand. The continuous reclamation of the *merjas* reduced the

pasture lands. This caused a progressive decline of the traditional rural livelihood, which induced an internal migration towards urban centres. Between 1910 and 1960, the Gharb's urban population increased from 130,000 to 540,000 inhabitants, particularly concentrated in the triangle of Kénitra–Souk El Arbaa–Sidi Kacem, with a consequent alteration of their tribal organization (Royaume du Maroc 1970).

Postcolonial institutional setting

The first decade after independence (1956) was characterized by institutional reforms to affirm the new state's administrative competence and social legitimacy in the country. New public bodies were established with clear responsibilities in the fields of water and agricultural management. After years of trials, in the 1960s an office for agricultural valorization was created, and then divided into regional offices (ORMVA, Offices régionaux de mise en valeur agricole, or Regional Offices of Agricultural Enhancement). In the Gharb, the regional office named ORMVA du Gharb (ORMVAG) acted as the lead institution, handling the equipment, management needs and scheme valorization. The Agricultural Investment Code (1969) guided the sector modernization process (Belghiti 2005; Akesbi 2006).

The new state also needed to build social trust among the people. With social expectations in favour of a state redistributive role, one of the key declared policies was the nationalization of lands that were confiscated to colonial settlers, to be followed by an agrarian reform to return dispossessed lands to local populations. The reform, however, has not been more than a rhetorical discourse, since the land distribution favoured other interests, mainly the direct state control of the productive resources, and then the agrarian bourgeoisie. State companies were created in the early 1970s in order to handle the fields recovered by land reform: mainly large properties of over 100 ha (El Gueddari 1998). The remaining land was granted to the rural bourgeoisie, rather than to the rural poor indigenous, to build a closer political alliance with the first group (Levau 1976; Swearingen 1988).

Projet Sebou

Centralized state control and large infrastructural development were partly influenced by foreign institutions. In the mid-1960s, following the World

Bank recommendations to solve the national financial problems, an economic strategy was developed with the aim to strengthen the primary sector and particularly exports. Water was considered a strategic but uncertain resource, thus large-scale hydraulic planning started to become central. Based on a preliminary study supported by UNDP and FAO, the huge *Projet Sebou* was launched in 1970 with the aim of transforming the river basin area into a strong economic region (Royaume du Maroc 1970; Swearingen 1988).

This project was in line with the *water supply* management approach, considering water as a transferable input to be stocked and then moved into deficit areas. Massive public investment was coordinated by the central government and supported by foreign sponsors, mainly through the World Bank (World Commission on Dams 2000). So far, installed infrastructures include ten large dams, forty-four small dams, a channel for water transfers, thousands of pumping stations and wells, and wide networks of irrigation and drainage canals. Other interventions are planned for the coming years (ABH Sebou 2006).

Implementation of the entire plan was supposed to be reached in 24 years, but it soon became clear that the target was overambitious. However, the favourable conditions of the Gharb plains made this area the first one to host the new infrastructures. In this region, the agricultural intensification of cash crops (e.g. rice, oilseeds and horticulture), and the introduction of new crops (like sugar cane), were sustained by the agro-industries (Boulassel *et al.* 2001), while ORMVAG invested in experimental laboratories to introduce new species (e.g. the Centre Technique des Cultures Sucrières in Kénitra) and in further infrastructural investments such as roads, water supply and electricity, primary education and dispensaries (Belghiti 2005). ORMVAG intervention has also included seed distribution, marketing, transportation services, settlements and rural street networks. As it was said by Mohamed El Hammouni, Chief of the exploitation service of the irrigation network (ORMVAG) interviewed in November 2007, 'There is nothing but the Office in the Gharb ... but unfortunately now there is an economic crisis. Since 1990 ORMVAG cannot intervene anymore'.

The Gharb, however, cannot be reduced to a productive space, as it is a complex region needing a more articulated governance system than a specialized institution like the ORMVAG could handle.

Wide pressures have been generated in local territories, their communities and the environment, but nowadays there is a gap of responsibility to address them. The following section will describe some of the impacts suffered by the Gharb region as a consequence of the *la politique des digues* of the 1970s–1980s and the following period of financial crisis.

Impacts of the mega hydraulics

In the Middle Atlas, where the dams are physically located, local spaces have been devastated, with no compensation for their inhabitants, who had to leave their villages (Aderghal and Agoumi 2000). But even in the Gharb Plain, *Projet Sebou* has produced some unforeseen impacts.

Population increase has induced extended land occupation that has endangered the original landscape, ecology and livelihoods in the transient margins of the marshlands (*merja*). In Western Gharb, communities living in tribal villages (*douar*) still practice rain-fed agriculture and complementary livestock along the *merja* borders. However, their livelihoods are challenged on two fronts. On the one hand, the new environmental regulations limit the right of pastoral activities, like in the Merja Zerga, recognized as a Ramsar site since 1980. On the other hand, in the western fringe of the *merja* and limited by coastal dunes, land is not accessible as it has been enclosed in intensive farming companies, outside the ORMVAG scheme. The presence of groundwater near the surface has in fact attracted new international investors who have installed greenhouse productions of high market value (watermelons, pineapples, avocados, peanuts, bananas, strawberries, and flowers); but the excessive pumping is already creating concerns for the increased salinity of water (ABH Sebou 2006). On the other side of the Gharb, on the eastern Gharb-Chrarda hills, not covered by the engineered networks, local communities are restricted in small holdings that are less able to grow cereals for self-consumption. Fertility collapse and soil erosion cannot be addressed by shifting cultivations to other areas, since what was traditionally considered collective land has been enclosed and sold; thus deprived farmers are forced to migrate (Berriane and Aderghal 2008).

Even in the Central Gharb the irrigation scheme is facing various obstacles. While the networks were expected to rationalize water uses and intensify productivity, the poor consensus gathered among local farmers has actually undermined the functioning of

the irrigation rules. Farmers interviewed in this area in May 2006 and November 2007 argued that the state did not actively involve or empower the people working in the scheme, and that they felt abandoned in the most critical phases.

Vulnerable groups integrated as manpower into the scheme can hardly make a living. Responding to market-driven agricultural goals rather than to the needs of the original tribal groups, and disregarding the previous territorialities that were based in the Gharb Plains, the project appears to have caused not only a physical change, but also social desegregation and economic problems.

Socio-economic disequilibria

The arguments in this section and the qualitative analysis reflect conversations and debates that I have had with local officers, consultants, farmers, students and researchers. Quantitative data have been acquired through official statistics, research reports and newspapers articles.

Official statistics report the situation of the Gharb region as presenting a poverty rate of 20.5 per cent against 14 per cent at the national level (Royaume du Maroc 2008). These data are surprising considering the massive investment that has been made in the Gharb for so many decades. However, it can be fully explained by the selective effort that has been made in this region: investment has been exclusively devoted to dominant groups, to strengthen their cash productions, at the expense of local communities and their food security.

Land tenure has been a discriminating factor for the socio-economic wealth in agriculture. In post-colonial Morocco, the priority assigned to the development of extensive irrigated and mechanized farming was incompatible with the expected land reform. Land reform, despite the promises, has failed to redistribute land to local farmers. Two spectacular operations of recuperation of colonial domains, mainly exploited for arboriculture (vineyards, citrus and olives) and horticulture, were established in 1963 over 316,380 ha and in 1973 over 446,005 ha (Ghannam 2005; El Farah 2007). However they were handed over, respectively, to large landowners and to new state companies: the Society of Agricultural Development (Société de développement agricole, SODEA), the Society of Agricultural Land Management (Société de gestion des terres agricoles, SOGETA) and the National Society for Livestock Development (Société nationale de

développement de l'élevage, SNDE). According to official data, these companies received 135,000 ha, and the remaining land was distributed over a decade to 21,000 tenants organized in 671 cooperatives and 11 unions (MADRPM 2006). Other sources, however, claim that even these lands included large areas granted to the establishment elite, including the royal family, while landless farmers were substantially neglected (Swearingen 1988; Najjar 2006).

As a matter of fact, the government engaged a policy that increased social disparity, allowing land accumulation at the hands of a minority of landowners (Swearingen 1988). Big owners have been targeted by special benefits, such as authorization for private pumping from the rivers and groundwater, discounted taxation, easy access to credit and marketing facilities (Boulassel *et al.* 2001). As for the small units, the national laws have set limitations for the minimum sizes of holdings: 5 ha in irrigated lands, according to the Agricultural Investment Code (BO 1969), and 10 ha in rain-fed lands, according to the law for the rain-fed land (*bour*) reclamation schemes (BO 1995a), and forbid the traditional inheritance subdivision system below these minimum sizes. However, families remain compliant with the customary rules and so the situation remains one of extreme parcelling, although many of these small properties are registered as combined with other ownerships, thus creating the so-called *indivisible properties*, meaning that the different co-owners cannot either rent or sell their parcel independently. More than a decade ago, Bensouda Korachi (1998) calculated that 62 per cent of the overall cultivated land of the region was registered in this category, and that the average holding of small farmers was only 1.09 ha. No official statistics are available to monitor this hidden situation, but some independent studies have reported the evolution of this increasing land fragmentation for some areas. A recent survey in three douars located on the right bank of the Sebou River (Rgrega, Ouled Moussa and Oled Mansour) reports that on the lands obtained by the reform and managed collectively, each farmer has been assigned between 1.2 and 3 ha, well under the thresholds indicated by law (Poncet *et al.* 2008). Another survey is based in the rural areas of Mnasra and Ben Mansour, Kénitra province (Hilali 2004). This is now the most dynamic area or region, although land is not connected to the irrigation networks of the Sebou project; however productive labour does not make farmers wealthier. More than 60 per cent of the households are based

on small holdings of 0.1 up to 4 ha; around 20 per cent are landless; while the remaining land is exploited in medium and large farms. Agriculture has been intensified by new private investments using groundwater pumped from the aquifer and introducing drip irrigation methods during the period 1984–1992, mainly due to outsider entrepreneurs from Rabat, Casablanca and, more recently, from Spain.

The new Moroccan landholders are mainly public officers or businessmen with no previous involvement in farming. In fact, they are absentees, and have expanded valuable cultivations through rental of land from the group of small landholders, particularly those having micro-holdings. The latter cannot ensure their own subsistence only through their land, and for this reason a common practice is to rent it out to the new class of agricultural entrepreneurs and to offer their workforce to them in exchange for salaries. A consultant report for the government (Chiche 2007) presents the average amounts gained by the small holders for both the rented land (around MAD 3000 ha/year, corresponding to EUR 266 or USD 372 in 2007) and the farming work (from MAD 3000 to 7500 per year and capita). The low rental fees are due to the low value of land unless it is equipped with private wells and pumps with electric engines, which only large entrepreneurs can afford to have. Salaried employment, though precarious, is considered to offer more security than direct farming for small landholders, and is surely the only possible income for landless families, who are mainly young and do not possess any cattle, if they do not have direct access to any borehole. Farmers in this group are paid less than MAD 3 per day and live in very poor shelters with no access to safe water.

The area around Kénitra is more dynamic. The capitalistic farming system of this province attracts labour from a wide area. According to Poncet *et al.* (2008), many among the most skilled workers of the Central Gharb have left their fields to be employed in the new companies of Kénitra. For those who can keep their own farming in small holdings, the main crop is fodder to feed the cattle (one to two head) to provide some earning through milk production, sale of calves and capital security. However, small holders remain particularly vulnerable and exposed to poverty.

Salaried work in farming also attracts children from the age of 11–12 years, leaving the school to contribute to their families' subsistence. This is the main reason why, in the rural Gharb, only very

reduced groups of students, after the primary level, access secondary and professional schools, with the result that 47.8 per cent of the population over 10 years are illiterate (Royaume du Maroc 2008). Children's contribution to the family income is also considered to be one of the reasons for the relatively high fertility rate: 2.7 children per woman compared with the national average of 2.5 children.

Local food security has been neglected as far as production choices are concerned. According to Moussaoui *et al.* (2003), in spite of the Gharb's economic contribution to the national GDP, 28 and 15 per cent of the population respectively do not meet their minimum requirements in calories and proteins, and 6.6 per cent of children suffer from acute malnutrition. This situation is particularly dramatic in remote villages. Female-headed households with children and older family members are a common reality in many douars, and rely on revenues of men and young boys working on the large farms, in the main towns or abroad. Neither farming nor livestock raising are their source of living, particularly since the neoliberal changes from the 1990s.

If the first migratory trend was mainly from the overpopulated and poor highlands of the High Gharb and Chrarda to the equipped Central Gharb, a second phase, started in the 1980s, is characterized by flows from the Central Gharb to reach the urban and industrial centres of Larache, Tanger, Kénitra, Tétouan and Casablanca. From the 1990s on, this flow has been integrated by a mobility of farmers towards the rich farms of the western Gharb. New households have been established around industrial and farming poles and near the cities. In the Gharb–Chrarda–Bni Hssen region, urban growth is calculated at a rate of 2.3 per cent a year compared with 0.7 per cent of demographic growth in the rural areas, and particularly due to the rural–urban migration flow, largely towards the regional centre of Kénitra (Royaume du Maroc 2008). However, this mobility has not ensured better social conditions of the migrants, since they have often settled in informal slums that are deprived of basic services, such as water, electricity, sanitation and so forth. The situation has become worse because of the recent economic crisis that has resulted in closure of industrial plants. According to the same official source, 12,490 people were employed in the region in 1999, which has decreased to 8727 in 2003; between 2002 and 2004, agro-industrial production has declined by 27 per cent.

Therefore, a new social re-composition has been

produced in the region, with growing cities and industrial areas attracting labour flows, but destroying the traditional social structure and increasing poverty. In more recent years, migration from the rural areas to foreign destinations, particularly to and through Spain, has become more common. While the national trend is reported by the *Annuaire statistique du Maroc* (Haut Commissariat au Plan 2008), with an index of -3.2 in 2005–2006 and -3.0 in 2006–2007, official data do not report the migration rate from the rural Gharb. However, visits to the fields and interviews with local people, public officers and researchers suggested that emigration is a very common strategy among the Gharb population.

In November 2007 we interviewed a group of women in Souk el Arbaa. They had husbands and other family members in Europe, especially in Spain. We discussed the use of their remittances in terms of investment for the future. In most cases, they did not consider farming in the Gharb Plain to be a viable economic activity for their families, although it had been important in the past. For them, farming presented too many risks of failure compared with the opportunities offered by other sectors, and therefore, they did not use remittances to buy new land, water pumps or farming machines. Rather, their goal was to improve their family's life in the urban centres, building a new house, buying a car and establishing new commercial activities downtown, while others were waiting for a visa to join their family members, since they could not see a future for their children and themselves in that area. There was indeed a common perception that people were vacating the village. They acknowledged that the family reunions abroad would definitely break the *douar* linkages and cultures, but they did not see them as a priority.

Environmental impacts

The construction of dams in the Sebou Basin has produced environmental changes in the region that were mostly unexpected, since the instalments were not preceded by any adequate impact assessments and protection measures (World Commission on Dams 2000). In fact, the ecosystem values were completely neglected. Some of the main environmental problems include loss of wetlands, alteration of water and soil quality, degradation of the river banks and coastal erosion (Laalou 1985). These impacts are similar to those suffered in other coastal areas of the Mediterranean region, where wetlands,

natural lakes and watersheds that are considered of international importance (i.e. Lake Ichkeul in Tunisia and the Great Sebkhia of Oran in Algeria, listed as Ramsar areas) are degraded by water diversion and artificial storage systems.

The ecology of the Gharb coastal plains, located downstream and targeted by wide agricultural and industrial development requiring water withdrawals and pollutant discharges, has been heavily modified. The drainage of the merjas has caused a loss of important habitats, hence an impoverishment of biodiversity and ecosystem functions. Waterbird species have been affected by the disappearance of the Merja Dawra and nearby wetlands that constituted a shelter for large populations. A comparative study by Green *et al.* (2002) on the conservation status of Moroccan wetlands and birds' habitats, with respect to the situation assessed in 1978 by Morgan (1982), shows a dramatic decrease in recorded species. The reasons are diverse: drainage, water extraction, fishing, hunting and egg collecting, overgrazing and reed cutting, pollution, siltation, urban and road development, and tourism.

Some merjas have received noteworthy attention by conservation movements and are now protected by national and international regulations. The Zerga and Sidi Bou Ghaba wetlands have been recognized as Ramsar sites and biological reserves. Nevertheless, they are still threatened by continuous agricultural intensification that lowers the freshwater levels entering the merjas, by industrial and urban expansion, and lastly, by the tourists of the new resorts built along the nearby sandy beaches.

The growth of informal settlements without proper sanitation facilities is also causing pollution in both the surface water and the water table (Nassali *et al.* 2005). The Sebou, particularly in the Gharb area, is the most heavily polluted river in Morocco (El Gueddari 1998). The main cause is the extensive use of fertilizers and pesticides in agricultural activities on the Plain, and the pollution of activities upstream. Chemical and organic pollution cause eutrophication of the rivers and of the dams' reservoirs, particularly El Kansera Dam, biodiversity loss and contamination of the groundwater used by the population for drinking purposes (Debbarh and Badraoui 2002).

The impact of agricultural runoff also affects soil quality. The primary outcomes are salinization and waterlogging, mainly due to excessive irrigation and insufficient drainage (Boulassel *et al.* 2006). Finally, the pumping of groundwater for coastal greenhouse

cultivations causes pressures on the aquifer, determines seawater intrusion, and thus, salinization of the resource.

Reflections of neoliberalism in the Gharb scheme

The analysis has so far supported the reconstruction of the Gharb history and the political strategies behind it. It has also unveiled the aggressive approach of the new Moroccan state, involving environmental, agricultural and social engineering experiments, and its consequences, in terms of a weakening of the local people to react to overall environmental degradation, political insecurity and economic recession. This section presents the current debate around the main policy changes that have more recently occurred in the Gharb. After decades of strong activity in water and production management, the state has started applying a new governance model of neoliberal influence. The discussion covers the appropriateness of the new institutional framework to support the economy and the communities that have been so heavily changed by the *Projet Sebou*.

The description of the main changes will reflect the points covered earlier in the theoretical review, and will particularly refer to the policy reforms referred to as *state disengagement* (and decentralization), *modernization* and *pricing*. These aspects have been discussed in the field and then supported by data gathered from secondary sources, mainly newspapers and reports.

From the analysis it is evident that despite the increasing need for coordinated governance of such a complex region and of the new challenges, the direct involvement of the state is decreasing. The economic crisis that had determined a lack of financial resources was requiring a change from the plan, which would not mean state abandonment at this stage. Nevertheless, the structural adjustment programmes of the World Bank and new trade agreements have been asking for a public disengagement in economy and service provision. A worldwide trend is changing the institutional and economic frameworks in various countries, leading to decentralization and progressive privatization of services, under the influence of international neoliberal approaches that guide aid programmes (Goldman 2007). In practice, the state does not retreat completely, but takes on new functions of production and control of the new legal and institutional assets aiming to facilitate the deregulation. The contemporary Moroccan state is

only selectively neoliberal: while it publicly advocates the reduction of formal regulation, free trade and labour market flexibility, it utilizes existing infrastructural investment to support certain corporate interests, unequal landownership and division systems.

This selectivity is also applied within the different economic sectors. While the presence of state companies in the primary sector is drastically decreasing, tourism appears to be the new frontier for economic growth, internationalization and country modernization (Alami 2004). A good indicator of the lower ranking of agriculture production in the macro-economic picture is the dismantlement of the state rural development companies: SNDE has already been sold, while SODEA and SOGETA have been for sale since 2004 (El Mahjoub 2005). The first phase of the liquidation programme has been accomplished by handing over 44,000 ha to national, but also Spanish and French investors. The second phase, involving 38,500 ha, is ongoing, and is confirming a return of foreign presence to direct management of land resources (Najjar 2006; El Farah 2007). In contrast, as already mentioned, public re-investment is evident in the tourism sector. The construction of new airports, roads and resorts has been finalized to increase the international attractiveness of Morocco, and thus, to gather hard currency. One example is the activity of the National Investment Society, a Moroccan public holding that in 2008 acquired important shares in an investment group of Abu Dhabi, SOMED, specialized in tourism resorts, with the aim of increasing the hotel sector's capacity in Morocco (OBG 2008).

As for the agricultural sector, the presence of the state continues in the form of normative and institutional changes. Decentralization in water management has been promoted by the Water Law 10/95 (BO 1995b). The law established River Basin Agencies, including one for the Sebou, which would take over some of ORMVAG's tasks, particularly those related to water monitoring, but not farming. The new water law embeds the *water scarcity* concerns, and for this, promotes the application of new water-saving measures, in line with the water demand management principle. Coherently, the plan to complete the infrastructural instalment of the Sebou only allows the introduction of new irrigation tools, like sprinkler and drip irrigation, and recommends a substitution of all old gravity canals that are still dominant in the Gharb (ABH Sebou 2006). Since these tasks will not be carried out by either the

ORMVAG or the Basin Agency, the government has launched a programme of improvement of large irrigation schemes with the aim of guiding a transfer of responsibilities from the state to the farmers, in line with the international principles of public–private participation (El Hammouni, interview 2007).

Under the programme, farmers who are not already members of cooperatives, producers' consortia or large companies have to form new water associations (Associations d'usagers de l'eau agricole, AUEAs). AUEAs should, theoretically, deal with a number of technical and economic management tasks relating to the public schemes. However, in reality, although 48 associations have been created in the Gharb region, their practical influence in the organization and distribution of water is irrelevant (Belghiti 2005). The failure is widely recognized and it was also admitted by two ORMVAG officers interviewed in 2007. Various reasons explain the poor effectiveness of the AUEAs: financial constraints, as they have not received the public support from ORMVAG that was originally foreseen; lack of capacity, as their constitution was not supported by adequate training given to the farmers taking on new functions; and lack of acceptance at the grassroots level, as their creation responds to top-down decisions and is not based on preliminary dialogue with the stakeholders. Ranvoisy (2001) also mentioned the lack of freedom within the AUEA administrations, which should include ORMVAG representatives on their boards.

To stimulate the application of modern irrigation tools, a national programme for promotion of localized irrigation was also launched in 2002. It proposed subsidies and technical advice to equip new surfaces and reconvert existing irrigation systems (El Hasnaoui *et al.* 2005). The government provided incentives covering 30–40 per cent of the installation costs and the enhancement of regional extension services (Royaume du Maroc 2006). However, their application has been low. On the one hand, large farmers have shown minimal interest in this programme, as they prefer to continue pumping water freely and directly from the river or the groundwater. On the other hand, most farmers cannot afford the remaining costs, particularly in situations of extreme fragmentation of the land tenure. In fact, small farmers have the greatest difficulties in accessing new irrigation facilities because they are authorized to use water from private machines only, provided that they use a minimum of 420 hours of irrigation per year (Boulassel *et al.* 2001). Even in this case,

the creation of AUEAs was supposed to facilitate access to water rights by using collective withdrawals. But although farmers are formally entitled to occupy small landholdings, the reality is a very low effective occupation. In November 2007, according to an ORMVAG officer responsible for the agricultural extension in Souk el Arbaa, only 20 per cent of the holdings were effectively occupied. This low and scattered presence does not allow the present farmers to work in a group and reach the minimum requirements to be entitled to the new irrigators. The weak implementation of this programme indicates the difficulties in working with specific technical and budget interventions that are not supported by coherent policies and in close relation with farmers' needs.

The other relevant change introduced by the government was the new pricing system, justified as an economic incentive in the water allocation decision made by producers (Tenneson and Rojat 2003). Already proposed by the Agricultural Investment Code of 1969, the water tariffs were initially aimed to cover equipment and maintenance costs. However, despite the law, ORMVAG kept the pricing low to encourage farmers' participation in the large irrigation schemes. From the 1990s, this policy has changed, and the previous low tariffs are now criticized for having caused waste of water and for having impeded substantial fee collection, thus making ORMVAG dependent on the state's, decreasing co-financing (Ait Kadi 2002; Frenken 2005).

However, the cost recovery problem cannot be solved by increasing the water fees. The farmers' capacity to pay is very low, and this new policy has already widened the group of non-paying users, particularly in a general situation of decreasing agricultural revenues. Paradoxically, the areas where the water-saving systems have been applied are those where farmers are facing greater difficulties. The application of sprinklers has in fact increased the equipment costs, and made the irrigation scheme dependent on expensive energy sources to run the tools. According to the chief of the network of Souk el Arbaa, interviewed on 21 November 2007:

The cost of water for cubic metre is higher where sprinklers are used, than in the areas where the gravitational systems are still in use: respectively, 0.52 dirham and 0.30 dirham per m³. When farmers do not work on their fields, they still have to pay the minimum amount of 3000 m³. In

these conditions, farmers do not accept the billing system. ORMVAG officers have reported many insolvency cases, with farmers indebted for more than 10 years. The collection of fee is a critical and conflicting issue, and has brought to acts of sabotage on irrigation tools.

Another cause of uncertainty in the farming revenues is the decreased power of the Gharb products in the international markets. The Gharb scheme has always been particularly focused on cash crops. Towards this aim, during the previous phase, ORMVAG had allowed farmers to get connected to the irrigation network, provided that they devoted the main share of their fields to some crops of interest for the scheme. Contracts were then established between farmers and local agro-industries, for the cultivation of sugarcane, sugar beet and rice. The available water was then also used by the farmers to cultivate some other crops, mainly for food. ORMVAG also supported the industrial productions with subsidies. But once ORMVAG's role suddenly declined, since the 1990s, subsidized economies were not allowed anymore, and local industries had difficulties in maintaining their contracts with the producers.

During the current decade, other factors intervened to weaken the agro-industrial economy of the Gharb. The entry into force of free trade agreements, first among the Arabic Nations (2004) and then between Morocco and USA (2006), made the national production collapse as a result of the more competitive goods produced in the other countries. For example, rice produced in the Gharb, which constitutes 95 per cent of the whole national production (ABH Sebou 2006), cannot be traded even within the country, since the demand can be met by cheaper Egyptian rice. As a consequence, the main sugar refineries and rice treatment plants of the Gharb are now closed, causing an interruption of the supply contracts with the farmers, and therefore, the end of a secure system of water access for them. Also for cereals, water tariffs have made local crops more expensive than imported products. This economic unsustainable loop has thus caused various dysfunctions in the irrigation system: it has induced increasing abandonment of the fields by farmers, which is then reflected in a progressive lack of care and maintenance of entire sections of the irrigation network (Kharbouchi 2005).

So far, no solutions are emerging for this problem. The responses are weak and do not seem

consistent with the scale of the issue. In line with international advice given by UN agencies and bilateral donors, to *build consensus* among the parties, the government has undertaken a National Water Dialogue since 2006. This programme is organized in focus groups, facilitated by external consultants, to discuss a revision of the tariff system, to encourage the farmers' compliance and to get their cooperation. The programme is enforced by foreign support. For example, in the rural area of Mnasra, local stakeholder groups have been activated by the international MedWet programme Dialogue on Water in the Middle East and North African Region with funding from German development cooperation agencies. The absence of a government institution in the coordination of the meetings is well appreciated by the international donors, for they see the presence of external consultants as neutral and environmentally friendly in the discussion forum. However, in this proposed decision-making process, there are factors of ineffective governance for at least three main reasons. First, public institutions, like the rural communes, play a minor role and are positioned at the same level as any other stakeholder, in spite of their delegation. A second weakness derives from a process relying on outsiders acting as experts in water saving and pricing, rather than on farmers' empowerment, and as facilitators, despite their poor local knowledge, with a clear mission of guiding the debate towards a set of pre-determined goals. Finally, the discussion is kept at the local level, which is not appropriate when dealing with issues related to the nationally wide agricultural and economic decline. International aid agencies have a responsibility for this, but still continue their programmes in the field, so far with poor practical results, while the central governmental institutions appear distracted – or perhaps disillusioned.

Conclusions

This article has discussed the interaction between water infrastructure and territorial power in post-colonial states and particularly in Morocco. It has investigated the shift from mega-engineered developmentalism towards neoliberal policies. It aims to complement critical studies on neoliberal environments, by focusing in particular on the manipulation, dispossession and commodification of water and land resources in irrigated agriculture in Morocco. These emerging rationalities are closely related to the changing policies of the contemporary

Moroccan state that have embraced some well established ideas promoted by international donor agencies and bilateral donors.

In particular, the analysis has been grounded on the Gharb Plain's case study. Two distinct economic and political phases have been recognized: first, the massive public involvement in the national economy by instalment of mega-structures, as a way to consolidate and modernize the new independent state; and a subsequent neoliberal phase, in which the state still keeps normative control, but is induced to abandon the control of economic sectors to the benefit of new international actors. A returning foreign presence seems to be producing a new form of corporate colonialism in the Gharb.

This study also brings to light that no serious attention is being paid by policy-makers to the fact that these changes involve the destiny of the majority of the local population, who are suffering from current institutional abandonment, territorial desegregation and increased poverty. There is continuous friction between the rigid, post-Keynesian spatial formations created by the postcolonial state through the Sebou irrigation project and the local territorialities. This relation has become contradictory to the current neoliberal setting of the scheme.

Projet Sebou has been maintained as a framework for regional development for more than four decades, despite its rigidity and the negative impacts it has produced. The *projet* has been very accurate in considering the physical and technical features in the design of the irrigation scheme, but it has disregarded the ethnic, social and the ecosystem values. The territorial organization of the local tribes, based on the *douar* centrality, has been obliterated, despite deep anthropological research being undertaken by Le Coz (1964) at the beginning of the irrigation project. The state did not directly target socio-economic wealth as the first priority of the plan, since – in line with the neo-classical economic principles – this would have been driven by macro-economic development as a trickle-down effect.

I have argued that, despite the massive amount of resources spent for the infrastructural development of the irrigation scheme, poverty remains a great issue in the region. In this context, the current sale of irrigation supply blocs has made farming in the district even more difficult for small landowners. At the same time, spatial and environmental changes have produced a detachment between the local populations and the Gharb territory. While their

inclusion as a local labour force in the big project had been quite passive, the current crisis has induced abandonment of the fields and migration flows towards more dynamic agricultural enterprises outside the irrigation scheme, to the urban centres or, more recently, to foreign countries.

Significant change has been witnessed in the past two decades, connected to the neoliberal policies, and expressed by three main factors: first, a general economic disengagement of the state from the agricultural sector, either as a provider of water and other basic services, or as a supporter of farmers through subsidies; second, the signature of free trade agreements that has left producers in direct competition with stronger international competitors and does not allow the state to intervene to help them avoid market failure and all related social consequences; and third, the introduction of water demand management policies, through institutional and legislative reforms, decentralized management and ineffective stakeholder participation. It is unrealistic for farmers, having executed ORMVAG's rules for decades, to suddenly take responsibility for the technical management of the networks or even make investments to introduce new water-saving technologies in their fields. Even the decentralized activities of environment monitoring and water quality control appear difficult to apply. So far, the disempowered ORMVAG is putting particular emphasis on the identification of pricing methods that could avoid insolvency and the abandonment of fields. There is currently a programme of focus group meetings in the fields, involving water user associations and agricultural producers, called by ORMVAG through the intermediation of national and international NGOs, in order to build a common agreement on tariffs (Chiche, interviews in 2007 and 2008). The role of private associations in local development issues is becoming more and more relevant, but this trend raises issues of democratic representation since the strongest groupings act on the basis of particular, rather than common interests (Mosse 2001).

There are issues in the Gharb resulting from the impacts produced by the national investment programmes exclusively focused on the cash crop sector, but the official policies underestimate and do not seem to prioritize them. Political decisions seem to be completely disconnected from the local situation. New trade agreements have contributed to a further weakening of national production, since

importations are more competitive than internal production. Environmental concerns seem to have received more consideration in recent trade agreements and market choices, while social problems are hardly addressed. Productivity remains the target and not rural poverty. New agricultural programmes of environmental sustainability, including water-saving practices, are funded by donor agencies, with the aim of enlarging the market opportunities of ecological productions. However, only wealthy farmers can benefit from these new projects. Without production support and market access, smallholdings cannot sustain a family living and therefore are abandoned. Emigration is the alternative to starvation and lack of a sustainable future on the land.

Water-saving and demand management are embraced by policy-makers as solutions to the current crisis. However, these solutions are misplaced if they do not consider the agricultural, environmental and social restructuring that have reshaped the area. In light of this, this article has critically scrutinized water demand management policies and three correlated concepts both theoretically and through the Gharb experience: technical modernization, state disengagement and water pricing. The challenges in applying these soft tools, and their outcomes, have been explored.

More generally, the study has integrated issues of water use and agricultural restructuring in countries subject to developmentalism and neoliberalism. Both approaches have been put under scrutiny for their impacts on the ecology, human communities and livelihoods. Furthermore, neoliberalism as a concept has been explored in relation to the main principles regulating the local political systems. In Morocco, neopatrimonialism protects the wealth of selected beneficiaries and only allows limited neoliberal policies to permeate the system, including a de-regulation and state de-responsibilization from non-profitable sectors, impoverished areas and communities.

Finally, the Gharb story has shown another case of neoliberal policies protecting the market and financial operators but destroying the people. Landscape changes, ethnic restructuring and emigration of the poor have been the consequences. Other stories, both in the so-called developed and developing world, have illustrated a similar destiny, showing the pervasive character of the neoliberal project and its re-territorializing impacts.

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References

- ABH SEBOU (2006): *Débat national sur l'eau. Le bassin hydraulique du Sebou*. Agence du Bassin Hydraulique du Sebou, Rabat.
- ADERGHAL, M. and AGOUMI, M. (2000): 'Le Barrage Al Wahda: l'aboutissement d'un vieux projet', *Revue de Géographie du Maroc* 18 (1–2): 71–74.
- AHMAD, M. (2000): 'Water pricing and markets in the Near East: policy issues and options', *Water Policy* 2 (3): 229–242.
- AIT KADI, M. (2002): 'Irrigation water pricing policy in Morocco's large scale irrigation projects', in HAMDY, A., LACIRIGNOLA, C. and LAMADDALENA, N. (eds): *Water Valuation and Cost Recovery Mechanisms in the Developing Countries of the Mediterranean Region*. Options Méditerranéennes, Série A: Séminaires Méditerranéens 49, CIHEAM-IAMB, Bari, pp. 51–71.
- AKESBI, N. (2006): 'Évolution et perspectives de l'agriculture marocaine', in *50 ans de développement humain au Maroc, perspectives 2025: rapports thématiques*. Gouvernement du Maroc, Rabat, pp. 85–198.
- ALAMI, A. (2004): *Le tourisme marocain: l'éternel espoir*. Media Ten, Casablanca.
- BELGHITI, M. (2005): 'Gestion de l'eau en agriculture au Maroc', paper presented at the Séminaire de promotion du SEMIDE et sur l'utilisation des systèmes d'information géographique pour la gestion et la protection des ressources en eau, Rabat, 27–28 April.
- BENSOUDA KORACHI, T. (1998): 'Vers la privatisation des terres: rôle de l'Etat dans la modernisation des régimes fonciers au Maroc', *Réforme agraire* 1998/1: 55–68.
- BERRIANE, M. and ADERGHAL, M. (2008): 'Etat de la recherche sur les migrations internationales à partir, vers et à travers le Maroc'. Country Paper: Morocco. Perspectives Africaines sur la Mobilité Humaine. Fondation MacArthur, Rabat.

- BERTONCIN, M., BICCIATO, F., BONOLLO, L., CROCE, D., FAGGI, P., MARIANI, L., MINOIA, P. and PASE, A. (1995): 'Irrigazione, stato e territorio in Sudan: il gioco della posta in gioco', *Terra d'Africa* 4: 15–58.
- BICCHI, F., GUAZZONE, L. and PIOPPI, D. (eds) (2004): *La questione della democrazia nel Mondo Arabo. Stati, società e conflitti*. Polimetrica, Monza.
- BICCIATO, F. and FAGGI, P. (1995): 'Gezira Scheme between state and market: some remarks on the privatization of irrigation in Sudan', *GeoJournal* 37 (1): 101–104.
- BO (1969): 'Décret n° 2-69-317 du 10 jourmada I 1389 (25 juillet 1969) portant création de commissions préfectorales ou provinciales des investissements agricoles et fixant la procédure d'instruction des demandes de subventions prévues par la réglementation sur les encouragements à la production agricole', *Bulletin officiel* [Rabat] 2960 bis (29 July), pp. 811–813.
- BO (1995a): 'Décret n° 2-94-589 du 2 jourmada II 1416 (27 octobre 1995) pris pour l'application de la loi n° 33-94 relative aux périmètres de mise en valeur en bour', *Bulletin officiel* [Rabat] 4333 (15 November), pp. 728–729.
- BO (1995b): 'Dahir n° 1-95-154 du 18 rabii I 1416 (16 août 1995) portant promulgation de la loi n° 10-95 sur l'eau', *Bulletin officiel* [Rabat] 4325 (20 September), pp. 626–663.
- BOULASSEL, A., COULIBALY, I., EL HASNAOUI, A., MIMOUNI, A. and MOTCHEMIEN, R. (2001): *Périmètre irrigué du Gharb au Maroc: quelles actions de recherche et de développement pour l'amélioration raisonnée du niveau d'intensification?* Documents de travail 99, Centre International pour la Recherche Agricole orientée vers le développement/Institut National de la Recherche Agronomique, Montpellier/Rabat.
- CAMMACK, D. (2007): 'The logic of African neopatrimonialism: what role for donors?', *Development Policy Review* 25 (5): 599–614.
- CASTRO, J. E. (2007): 'Poverty and citizenship: sociological perspectives on water services and public-private participation', *Geoforum* 38 (5): 756–771.
- CHICHE, J. (2007): 'Etude de Diagnostic de la nappe de Mnasra, Wilaya de Kenitra. Diagnostic de la situation des usages et des usagers des eaux'. Coopération Allemande InWent et MedWet pour les Zones Humides Méditerranéennes/Agence du Bassin Hydraulique du Sebout, Royaume du Maroc, Rabat, February.
- DAVIS, D. K. (2006): 'Neoliberalism, environmentalism, and agricultural restructuring in Morocco', *Geographical Journal* 172 (2): 88–105.
- DEBBARH, A. and BADRAOUI, M. (2002): 'Irrigation et environnement au Maroc: situation actuelle et perspectives', in MARLET, S. and RUELLE, P. (eds): *Vers une maîtrise des impacts environnementaux de l'irrigation. Actes d'atelier du PCSI, 28–29 mai 2002, Montpellier, France*. Centre de Coopération Internationale en Recherche Agronomique pour le Développement, Montpellier.
- DELANEY, D. (2005): *Territory: A short Introduction*. Blackwell, Malden, MA.
- DUAN, Y. and STEIL, S. (2003): 'China Three Gorges Project resettlement: policy, planning and implementation', *Journal of Refugee Studies* 16 (4): 422–443.
- EL FARAH, T. A. (2007): 'SODEA-SOGETA: la phase II a commencé', *Aujourd'hui Le Maroc* 17 April.
- EL GUEDDARI, Z. (1998): L'impact de l'industrie agricole sur l'eau et l'environnement de la région du Gharb. Unpublished PhD thesis, Université de Moncton, Moncton, NB.
- EL HASNAOUI, A., HILALI, A. and RAKI, M. (2005): 'Gestion de la pauvreté hydrique au Maroc, l'irrigation localisée au Maroc: cas du Gharb', paper presented at the International Workshop on Water Poverty and Social Crisis: Perspectives for Research and Action, 12–15 December, Université Ibn Zohr, Agadir.
- EL MAHJOUR, R. (2005): 'SODEA-SOGETA: Les terres agricoles ouvertes aux étrangers', *Le Matin* 9 August.
- ESCOBAR, A. (1995): *Encountering Development: The Making and Unmaking of the Third World*. Princeton University Press, Princeton, NJ.
- FAO (2002): *Eau et agriculture. Produire plus avec moins d'eau*. Food and Agriculture Organization of the United Nations, Rome.
- FLYVBJERG, B., BRUZELIUS, N. and ROTHENGATTER, W. (2003): *Megaprojects and Risk: An Anatomy of Ambition*. Cambridge University Press, Cambridge.
- FRENKEN, K. (ed.) (2005): *L'irrigation en Afrique en chiffres. Enquête AQUASTAT – 2005*. FAO Water Report 29, Food and Agriculture Organization of the United Nations, Rome.
- GHANNAM, F. (2005): 'SODEA-SOGETA: des partages fermes', *Aujourd'hui Le Maroc* 9 September.
- GOLDMAN, M. (2007): 'How "Water for all!" policy became hegemonic: the power of the World Bank and its transnational policy networks', *Geoforum* 38 (5): 786–800.
- GREEN, A. J., EL HAMZAOU, M., EL AGBANI, M. A. and FRANCHIMONT, J. (2002): 'The conservation status of Moroccan wetlands with particular reference to waterbirds and to changes since 1978', *Biological Conservation* 104 (1): 71–82.
- HARVEY, D. (2003): *The New Imperialism*. Oxford University Press, New York.
- HARVEY, D. (2005): *A Brief History of Neoliberalism*. Oxford University Press, Oxford.
- HASHIM, M. J. (2010): 'The dams of Northern Sudan and the policy of demographic engineering', *International Journal of African Renaissance Studies – Multi-, Inter- and Transdisciplinarity* 5 (1): 148–160.
- HAUT COMMISSARIAT AU PLAN (2008): *Annuaire statistique du Maroc*. Direction de Statistique, Ministère de la Prévision Economique et du Plan, Rabat.
- HEYNEN, N., MCCARTHY, J., PRUDHAM, S. and ROBBINS P. (eds) (2007): *Neoliberal Environments: False Promises and Unnatural Consequences*. Routledge, New York.
- HILALI, A. (2004): Diagnostic du développement de l'irrigation dans le Périmètre du Gharb (cas de Bhara-S.Med. Lahmer et Beht). Unpublished Master's thesis, Université Hassan II, Rabat.
- HUNT, E. and HUNT, R. C. (1978): 'Irrigation, conflict and politics: a Mexican case', in COHEN, R. and SERVICE, E. R. (eds): *Origins of the State: The Anthropology of Political Evolution*. Institute for the Study of Human Issues, Philadelphia, PA, pp. 69–124.
- JESSOP, B. (2002): *The Future of the Capitalist State*. Polity, Cambridge.
- KHARBOUCHI, A. (2005): 'Problématique territoriale de la sous valorisation des ressources en eau dans la Région Gharb-Charada-Bni Hssen, Maroc', Tamina 15 June [online]. URL http://www.tanmia.ma/article.php3?id_article=2112 [accessed 22 January 2007].
- LAALOU, A. (1985): Impact des barrages sur l'environnement au Maroc. Unpublished PhD thesis, Institut National d'Aménagement et d'Urbanisme, Rabat.
- LAUREANO, P. (2001): *The Water Atlas. Traditional Knowledge to Combat Desertification*. Bollati Boringhieri, Torino.
- Laurie, N. (ed.) (2007): 'Themed issue: Pro-poor water? The

- privatisation and global poverty debate', *Geoforum* 38 (5): 753–907.
- LE COZ, J. (1964): *Le Rharb, fellahs et colons. Étude de Géographie régionale*. Thèse d'Etat, 2 vols. IMFRAMARCUS, Rabat.
- LEVAU, R. (1976): *Le fellah marocain, défenseur du trône*. Éditions de la Fondation Nationale des Sciences politiques, Paris.
- MADRPM (2006): 'Rapport National du Royaume du Maroc', report by Ministère de l'Agriculture, du Développement Rural et des Pêches Maritimes to the Conférence internationale sur la Réforme Agraire et le Développement Rural, Porto Alegre, 7–10 March.
- MCCARTHY, J. (2007): 'Privatizing conditions of production', in HEYNEN, N., MCCARTHY, J., PRUDHAM, S. and ROBBINS P. (eds) (2007): *Neoliberal Environments: False Promises and Unnatural Consequences*. Routledge, New York, pp. 38–50.
- MCNEILL, J. R. (2000): *Something New Under the Sun: An Environmental History of the Twentieth-Century World*. Norton, New York.
- MINOIA, P. (2006): 'La natura politica e geografica dell'acqua: analisi territoriale e gestione delle risorse idriche', *Rivista Geografica Italiana* 113 (3): 465–497.
- MINOIA, P. and GUGLIELMI, F. (2008): 'Social conflict in water resource management and its environmental impacts in South-Eastern Tunisia', in EFE, R., CRAVINS, G., ÖZTÜRK, M. and ATALAY, I. (eds): *Natural Environment and Culture in the Mediterranean Region*. Cambridge Scholars Press, Newcastle upon Tyne, pp. 257–270.
- MORGAN, N. C. (1982): 'An ecological survey of standing waters in north west Africa. III. Site descriptions for Morocco', *Biological Conservation* 24 (3): 161–182.
- MOSSE, D. (2001): "'People's knowledge", participation and patronage: operations and representations in rural development', in COOKE, B. and KOTHARI, U. (eds): *Participation: The New Tyranny?* Zed, London, pp. 16–35.
- MOUSSAOUI, M., ABALGHITI, A., BENDAOUD, M. and DOUKKALI, R. (2003): 'Contribution de l'agriculture à la sécurité alimentaire au Maroc', report to Roles of Agriculture Project International Conference, 20–22 October, Rome.
- NAJJAR, K. (2006): Libéralisation des terres agricoles publiques au Maroc – SOGETA et SOGEA. Unpublished dossier, Gouvernement du Maroc, Rabat.
- NASSALI, H., BEN BOUIH, H., SRHIRI, A. and DHAHBI M. (2005): 'Influence des rejets des eaux usées sur la composition des eaux de surface et des sédiments superficiels du lac Merja Fouarate au Maroc', *Afrique science* 1 (1): 145–165.
- OBG (2008): *Annual Business Economic and Political Review: Morocco*. Oxford Business Group, London.
- OMER, A. M. (2008): 'Water resources and freshwater ecosystems in Sudan', *Renewable and Sustainable Energy Reviews* 12 (8): 2066–2091.
- OUBALKACE M. (2007): 'National report on Monitoring progress and promotion of water demand management policies. Morocco', paper for the conference Water demand management in the Mediterranean, progress and policies, Zaragoza, 19–21 March. Plan Bleu, Regional Activity Centre, Sophia Antipolis.
- PETRELLA, R. (2001): *The Water Manifesto: Arguments for a World Water Contract*. Zed, London.
- PONCET, J., KUPER, M. and CHICHE, J. (2008): 'La transformation des territoires en grande hydraulique: les impacts du Projet Sebou', in KUPER, M. and ZAÏRI, A. (eds): *Economies d'eau en systèmes irrigués au Maghreb. Actes du troisième atelier régional du projet Sirma, Nabeul, Tunisie, 4–7 juin 2007*. Centre de Coopération Internationale en Recherche Agronomique pour le Développement, Montpellier.
- RANVOISY, M. (2001): *Rôle des associations d'irrigants au Maghreb (Maroc et Tunisie) dans le contexte de désengagement de l'Etat*. EN-01-4, École nationale du génie rural, des eaux et des forêts/Office International de l'Eau, Montpellier/Limoges.
- ROBBINS, P. (2004): *Political Ecology: A Critical Introduction*. Blackwell, Oxford.
- ROYAUME DU MAROC (1970): *Atlas du Bassin du Sebou*, 2 vols. Ministère de l'Agriculture et de la Réforme Agraire, Rabat.
- ROYAUME DU MAROC (2006): *Débat National sur l'Eau. Plate Forme*. Gouvernement du Maroc, Rabat.
- ROYAUME DU MAROC (2008): *Inspection régionale de la Région Gharb-Chrarda-Bni Hssen*. Ministère de l'Habitat, de l'Urbanisme et de l'Aménagement de l'Espace, Rabat.
- SECOR, A. J. (2010): 'Social surveys, interviews, and focus groups', in GOMEZ, B. and JONES, J. P., III (eds): *Research Methods in Geography*. Wiley-Blackwell, Oxford, pp. 194–205.
- SHIVA, V. (2002): *Water Wars: Privatization, Pollution and Profit*. South End Press, Cambridge, MA.
- SHOWERS, K. B. (2011): 'Electrifying Africa: an environmental history with policy implications', *Geografiska Annaler: Series B, Human Geography* 93 (3): 193–221.
- SIDAWAY, J. D. (2007): 'Spaces of postdevelopment', *Progress in Human Geography* 31 (3): 345–361.
- SMART, M. (2003): 'River flow regulation and wetland conservation in a dry country: Ichkeul, Tunisia'. Centre for Mediterranean Cooperation, International Union for Conservation of Nature, Malaga.
- SWEARINGEN, W. D. (1988): *Moroccan Mirages: Agrarian Dreams and Deceptions, 1912–1986*. Princeton University Press, Princeton, NJ.
- SWYNGEDOUW, E. (1999): 'Modernity and hybridity: nature, regeneracionismo, and the production of the Spanish water-scape, 1890–1930', *Annals of the Association of American Geographers* 89 (3): 443–465.
- SWYNGEDOUW, E. (2005): 'Dispossessing H₂O: the contested terrain of water privatization', *Capitalism Nature Socialism* 16 (1): 81–98.
- SWYNGEDOUW, E. (2007): 'Technonatural revolutions: the scalar politics of Franco's hydro-social dream for Spain, 1939–1975', *Transactions of the Institute of British Geographers* NS 32 (1): 9–28.
- TENNESON, M. and ROJAT, D. (2003): 'La tarification de l'eau au Maroc: comment server différentes causes?', *Afrique contemporaine* 205: 151–169.
- TRANSFORMATION RESOURCE CENTRE (2000): 'Too many dams, too little water – Lesotho's rivers could become "waste water drains"', International Rivers: People, Water, Life 31 October [online]. URL <http://www.internationalrivers.org/en/too-many-dams-too-little-water-lesotho-s-rivers-could-become-waste-water-drains> [accessed 9 July 2011].
- TURCO, A. (1988): *Verso una teoria geografica della complessità*. Unicopli, Milano.
- UNDP (2006): *Human Development Report 2006. Beyond Scarcity: Power, Poverty and the Global Water Crisis*. Palgrave Macmillan, New York.
- VARELA-ORTEGA, C. and SAGARDOY, J. A. (2003): 'Irrigation water policies in Syria: current developments and future options', in FIORILLO, C. and VERCUEIL, J. (eds): *Syrian Agriculture at the Crossroads*. Agricultural Policy and Economic Development Series 8, Food and Agriculture Organization of the United Nations, Rome, pp. 335–359.

- WARD, C. (1997): *Reflected in Water: A Crisis in Social Responsibility*. Cassel, London.
- WATERBURY, J. (1979): *Hydropolitics of the Nile Valley*. Syracuse University Press, Syracuse, NY.
- WITTFOGEL, K. A. (1957): *Oriental Despotism: A Comparative Study of Total Power*. Yale University Press, New Haven, CT.
- WORLD COMMISSION ON DAMS (2000): *Dams and Development: A New Framework for Decision-making*. Earthscan, London.

Interviews

- CHICHE, J., consultant involved in the National Water Dialogue, Rabat, 20 and 22 November 2007 and 12 December 2008.
- EL HAMMOUNI, M., chief of the exploitation service of the irrigation network (ORMVAG), Kénitra, 20 November 2007.
- ORMVAG officer, chief of the irrigation network, Souk el Arbaa, 21 November 2007
- ORMVAG officer, responsible for the agricultural extension, Souk el Arbaa, 21 November 2007.
- Womens group, four members, Souk el Arbaa, 21 November 2007.
- Other interviews with local residents were conducted by the students of the Master's course ADEGEST (Aménagement, développement local et gestion des territoires) in November 2007.