Environmental change and human security in Lesotho: The role of the Lesotho Highlands Water Project in environmental degradation

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Introduction

Lesotho has a highly fragile environment, characterised by a number of environmental problems that are induced by both natural and human activities. These problems have negatively impacted on environmental and human security in the country. A major part of the problem is that the country's environmental issues have not yet been politicised by the political elite, and have accordingly not yet become a concern at a high political level.

Though there are a number of factors that contribute to environmental problems in Lesotho, this paper examines the contribution of the Lesotho Highlands Water Project (LHWP) towards environmental change and its impact on environmental and human security in the country. The paper is divided into three sections. The first examines

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the theoretical dimensions of the relationship between environmental security, environmental change and human security. The second briefly outlines the general state of environmental problems in Lesotho, while the third examines the role of the LHWP in environmental degradation, in terms of resource depletion and degradation, and its impact on environmental and human security. In the conclusion potential solutions to the challenges of environmental problems associated with the project and the country as a whole are put forward.

Environmental security, environmental change and human security

Environmental security, according to Cyril Obi (2000:50–51), focuses on controlling a range of threats or contradictions that arise due to the interaction between human beings and nature. This can either be in the form of the extraction of natural resources or their transformation into food, goods and services for human security and commercial purposes. Environmental degradation arising from the extraction and transformation of these resources constitutes a threat, however, because it may lead to the depletion of such resources either in terms of quantity or quality. Resource extraction and transformation are dependent on access, control, ownership and power, and are therefore linked to political economy and security. On the whole, environmental change constitutes a major threat to human security.

Environmental change refers to natural and human-induced changes to the earth's environment, which affect land use and land cover, bio-diversity, atmospheric composition and climate (Page 2000:33). Nina Graeger (1996) argues that there are at least four reasons for advancing a theoretical and operational relationship between security and environmental change caused by human activity. First, environmental degradation is itself a serious threat to human security. Second, environmental degradation or change can be both cause and consequence of violent intra- and interstate conflict. Third, in order to safeguard the environment, the question of predictability and control become integral components of security considerations. Environmental security may lead to improvements in political security if the interaction between the two and how these interactions contribute to an enhancement of human security are understood. Predicting mass environmental migration from environmentally devastated areas into neighbouring regions is a crucial aspect of such an understanding, since such a migration may directly or indirectly lead to violent conflicts, either within a state or between one state and its neighbours. Finally, there is a cognitive link between the environment and security that establishes an important political contribution to the concept of environmental security. Securitising environmental issues politicises them so that they become a concern at a high level. In this way they become priority issues that require an urgent response at the highest political level. If they become part of low-level politics, environmental concerns

lose political importance and urgency and are likely to attract less public interest (Graeger 1996:109–111; Allenby 2000:6–7).

There is a perceptible relationship between environmental change and intra- and interstate conflict. According to Wenche Hauge and Tanja Ellingsen (1998:300), most studies that focus on the link between environmental change and conflict pay attention to the relationship between conflict and degradation and depletion of renewable resources. Resources can be generally be divided into two groups, namely non-renewable resources like oil and iron ore, and renewable resources like fresh water, forests, fertile soils and the earth's ozone layer. Renewables also include renewable goods, such as fish and timber, and renewable services, such as regional hydrological cycles. In developing countries, of the major environmental changes facing humankind, degradation and depletion of resources will contribute more to social turmoil than climatic change in the near future. Environmental change is only one of the three main causes of scarcity of renewable resources. The others are population growth and unequal social distribution of resources, but the concept of environmental scarcity relates all these factors and, indeed, environmental problems are often characterised as resource scarcities (Homer-Dixon 1994:7–9).

Val Percival and Thomas Homer-Dixon (1998:280) identify three types of environmental scarcity, namely supply-induced scarcity caused by resource degradation and depletion; demand-induced scarcity resulting from population growth within a region or increased per capita consumption of a resource; and structural scarcity arising from an unequal social distribution of a resource that concentrates it in the hands of relatively few people while the rest of the population suffers serious shortages. Both supply-induced scarcity and demand-induced scarcity can heighten the demand for the resource. The social effects of scarcity and its interactions include lower agricultural production and environmental migration, which can in turn lead to weakening of state institutions. If these results are perceived as causing a relative decrease in their standard of living compared with other groups or compared with their aspirations, and they see little chance of their aspirations being addressed under the status quo, it will lead to an increase in grievances.

Homer-Dixon (1994:6) emphasises that while social conflict is not always negative because it can provide opportunities for positive change in resource distribution and governance processes, scarcity is more likely to hamper efforts at meaningful social change. He argues that environmental scarcity can sharply increase demands on key institutions, such as the state, while at the same time reducing their capacity to meet these demands. This increases the chances that such institutions will either fragment or become more authoritarian.

There are two views of environmental conflict, and thus environmental security. The first concerns the way in which conflict over natural resources threatens to undermine the security of states. The second concerns the way in which degradations of the

environment threaten to undermine the security of states, and possibly other entities. A number of scholars have sought to defend the view that the most salient impact of environmental change is that it threatens human security (Page 2000:34–35). However, in this paper the view is that particularly the way in which human-induced environmental degradation threatens human and environmental security in Lesotho is of prime importance in human security. The paper pays particular attention to the role of the LHWP in environmental degradation and resultant impact on environmental and human security. However, first it is necessary to outline the general environmental problems in Lesotho so as to obtain a clear view of the environmental conditions in the country.

Environmental problems in Lesotho

Lesotho's environment is characterised by a number of problems such as steep slopes and frail soil formation, the decline in soil quality and soil erosion, scarcity of arable land, and climate variability. Soil erosion in particular is evident throughout the country in the deep gullies in the lowlands and exposed rock in the mountains and it is estimated that 0,25 per cent of the total arable land or 3,6 million tonnes of soil is lost through soil erosion each year. These environmental problems have significantly undermined agricultural development and contributed to a decline in agricultural production, thus aggravating the problems of food shortage and poverty (Mphale & Rwambali 2003:24; KOL 2004:86).

The country has also experienced a severe environmental decline with regard to biodiversity. There has been a loss of or decline in habitats such as grasslands, marshes, bogs and reed meadows leading to significant changes in flora and fauna. The loss of biodiversity has several adverse effects on the rural poor, including the decline or even loss of wood for fuel and a decline in medicinal plants that are or were used extensively by poor households unable to afford and easily access modern health services. The replacement of indigenous grasses by invasive inedible shrubs also adversely affects the livelihoods of those households that depend on livestock. Because rangelands have lost their diversity and their quality and quantity have declined, too, there has been a resultant drop in the productivity of the livestock and, hence, the income of their owners. Poverty can therefore be regarded as both a cause and consequence of environmental degradation in Lesotho. Natural resources are overused and thus depleted because people are poor, which has consequently lead to further impoverishment and an inability to maintain their livelihoods (KOL 2004:86–88).

Most of the environmental changes in the country are the result of human activity. These include undesirable activities such as cultivating on marginal lands without undertaking any conservation measures, practising destructive grazing patterns and regimes, overstocking the rangelands, poor natural resource management techniques as

well as establishing human settlements on fragile and scarce arable lands (Mphale & Rwambali 2003:27).

Although Lesotho passed the Environment Act in 2001, it has not yet become enforceable. One of the key objectives of the Act was to ensure that environmental impact assessments (EIAs) are conducted to determine the negative consequences of socio-economic development in the country on the environment. However, the recommendations of the EIAs, which are conducted by administrative government personnel, are not legally binding. Some stakeholders, among them line ministries, do comply with the EIA recommendations, but the majority do not cooperate or comply with the process. The implementation process is also hampered by the shortage of skilled personnel to monitor compliance (KOL 2004:89).

Henry Sibanda (2003:40) argues that Lesotho's contemporary environmental problems have reached unprecedented proportions because the country attempts to solve them by focusing on the physical environment rather than paying more attention to the social, cultural and political aspects of the environment. Indeed, researchers of environmental security argue that central to the notion of a politicised environment is the recognition that environmental problems and various dimensions of environmental conflicts cannot be understood in isolation from the political and economic context within which they emerge (Nüsser 2003:22).

Though there are several economic, political and social factors that contribute to environmental change in Lesotho, this paper focuses on the role of the LHWP in environmental degradation and the implications of this for human and environmental security.

The LHWP, environmental degradation and human security

This section examines the contribution of the LHWP, the largest water transfer scheme in the world, to environmental change, and focuses in particular on human-induced environmental degradation and its impact on human security in Lesotho. It can also be considered to be a supply-induced environmental scarcity, because the Project has contributed to the degradation and depletion of renewable resources.

Marcus Nüsser (2003:21–26) argues that large dams have become a topical issue because of their frequently pervasive and negative environmental impact and socio-economic consequences. Advocates of dam construction generally emphasise advantages of modernisation, technological progress and water supply in arid and semi-arid regions, which in turn lead to regional or national economic development. Opponents place emphasis on a whole range of negative environmental aspects and high socio-economic and political costs of involuntary resettlement.

The main environmental impact of dams generally includes destruction of riverine ecosystems, changes in flow patterns, modification of erosion and deposition processes, species extinction in freshwater and wildlife habitats, and loss of water by evaporation and contamination. The social costs of involuntary resettlement due to construction of large dams are as striking as the ecological ones. According to Nüsser between 40 and 80 million people worldwide are forced off their settlements, agricultural lands and forests and lose other resources due to dam-related flooding. Other people also affected by dam construction include rural dwellers residing downstream from such dams. They are often neglected in project assessments, because of the assumption that they will benefit from the project. However, dams frequently have a significant negative impact downstream. Several of these environmental and socio-economic effects apply in the case of the LHWP.

The aim of the LHWP, a combined project between the Kingdom of Lesotho and the Republic of South Africa, is to exploit the water resources of the highlands of Lesotho to the mutual advantage of both countries. It is one of the most comprehensive engineering projects of its kind in the world. The LHWP treaty was signed on 24 October 1986 between the two governments (LHWP 2007). The project consists of four phases and the Lesotho Highlands Development Authority (LHDA) is the implementing agency of the LHWP.

Phases IA and IB have already been completed. Phase IA comprised the building of Katse Dam in the central Maluti Mountains, an 82 km transfer and delivery tunnel system reaching to the Ash River outfall structure across the border in South Africa, and the Muela hydropower station and associated structures. Phase IB comprised the building of Mohale Dam on the Senqunyane River some 40 km southwest of Katse Dam, a 32 km long transfer tunnel between the Mohale and Katse reservoirs, a 19 m high concrete division weir in the Matsoku River, and a 5,6 km long tunnel.

Phase II will entail the construction of Mashai Dam on the Senqu River at Mashai, a pumping plant, and a water conveyance tunnel to Katse Dam. Phase III will entail the construction of Tsoelike Dam just below the confluence of the Senqu and Tsoelike rivers some 90 km downstream of Mashai Dam. In Phase IV an additional dam will be built at Ntoahae, 40 km downstream of Tsoelike Dam on the lower reaches of the Senqu River (TCTA-LHDA 2002:3; LHDA 2004:2).

Upon completion in about the year 2020, five dams, water transfer works and 200 km of tunnels will have been constructed between the two countries. More than 2 000 million cubic metres of water will be transferred from Lesotho to the South African network each year.

The socio-economic and environmental impacts related to the implementation, operation and maintenance of the LHWP form the basis of the LHDAs compensation policy. The basis of the compensation policy is set out in articles 15 and 17 of the LHWP

Treaty, which deal with the LHDA and social and environmental considerations. Article 15 of the treaty states that 'the Parties agree to take all reasonable measures to ensure that the implementation, operation and maintenance of the Project are compatible with the protection of the existing quality of the environment and, in particular, shall pay due regard to the maintenance of the welfare of persons and communities immediately affected by the Project' (KOL/RSA 1986:10).

The compensation policy has three broad objectives. First, to facilitate and provide mechanisms aimed at ensuring popular participation of those people and communities directly and indirectly affected by the LHWP. Second, to ensure that compensation principles are applied uniformly throughout the project. Third, to include all elements of the development, environmental protection, health and social welfare as an integral part of the environmental action plan. The costs of implementing this policy are counted as project costs and as such are borne by the LHDA (2002:7).

Although several studies were undertaken addressing the project, and despite the treaty's stated commitment to social and environmental considerations, the various construction phases of the project continue to cause unwarranted environmental destruction. The impact of reservoir inundation and dam construction on the quantity and quality of natural resources in the project areas has been enormous, particularly with regard to the loss of arable, crop and grazing land, as well as soil erosion. This has in turn had a negative impact on human environmental security in the country (Mwangi 2007:12).

Project construction has contributed significantly to environmental change, particularly with regard to environmental degradation. Thabhane (2000:635) has noted that the project construction has affected highland communities in various ways. In some cases, residents lost their homes but not their agricultural and grazing land; in others they lost agricultural and grazing land but not their homes; in yet others their movement has been hampered because reservoirs have become barriers between their villages and hitherto accessible areas. In all these cases communities have tried to find alternative resources to replace those they had lost within the area where they originally lived and worked. In some cases, however, people lost everything and were left with only their movable property.

The reservoir inundation and dam construction have had a massive impact on the quantity and quality of natural resources in the vicinity of the project. It has also been a major obstacle to restoring the livelihoods of affected people in terms of the environmental action plan (Hoover 2001:7). During the Phase IA construction of Katse Dam, the affected people were relocated both uphill and downhill because of activities related to the construction of the dam, such as the erection of powerlines and road alignments. The gorges below provided the perfect catchment area to contain Katse reservoir water. Prior to the project the valleys were used mostly for farming and grazing purposes. The implementation of Phase IA affected approximately 2 300 people (LHDA 2005:1).

In the case of the construction of Mohale Dam during Phase IB, the valleys, gorges and oxbows in which a number of communities actually lived, eventually became the catchment area of the reservoirs. According to the environmental impact studies conducted prior to construction, approximately 1 700 individuals would be affected by Phase IB, mainly people who had to vacate the basin areas. In terms of the resettlement programme communities were given the option to move uphill into the highland regions, resettle in the foothills or move to the urban centres. The resettlement was effected in stages and Mohale Dam was impounded in November 2003. Thereafter an additional 155 families lost arable land to inundation of the dam (LHDA 2005:1, 2).

Less than 10 per cent of the total land area of Lesotho is suitable for arable farming. Phase I of the project destroyed approximately 1 500 hectares of arable land, 1 900 hectares of cropland and 5 000 hectares of grazing land. About 2 345 households owned fields in the submerged areas and many others sharecropped it. The project has taken over Lesotho's most fertile land, including the Mohale area, which was the only region in the country that produced an agricultural surplus. The alluvial soils in the mountains are rich, deep and produce high yields. The loss of so much land has placed an acute strain on food security, particularly as two-thirds of the people living in the affected areas depend on locally produced food crops (Tricarico 2002:7; Mwangi 2007:12–13). Other communal assets that have also been severely affected include fuel resources (providing energy and income), wild vegetables (providing additional nutrition) and medicinal plants. The depletion of these resources has led to losses in income and food energy and a decline in health standards of the affected communities (Hoover 2001:8–9).

Soil erosion, already a major problem in Lesotho, has been aggravated by the construction of the project and access roads to the highlands. The LHWP has contributed to the scarcity of cultivated land and has pushed peasants onto soil more vulnerable to erosion (Bond 1999:23). The problem is becoming worse as displaced villagers are forced to cultivate and overgraze steeper hillsides. The downstream impacts also appear to have been overlooked (Tricarico 2002:3). Another project-related threat to the precious remaining arable land comes from poor drainage systems along LHWP roads. The runoff from these culverts creates ever-widening gullies that have, in some cases, forced farmers to plough against the contour of the hillside, accelerating erosion even more. Side-spoil, left over from road construction, has ruined other fields, because the rocks are too large to move and too numerous to plough around (Hoover 2001:7). The type of environmental scarcity caused by the project can be referred to as supply-induced because it was caused by resource degradation.

Project construction has also destroyed crucial habitats of endangered species such as the Maluti minnow and bearded vulture as well as four other species considered to be globally threatened. Since LHWP planning followed a purely economic logic, initial feasibility studies failed to include an environmental impact assessment. Hence linings

for tunnels were inadequate and had to be cemented; reservoir-induced earthquakes were far worse than anticipated; and soil erosion and sedimentation were not initially taken into consideration (Bond 1999:23).

A study conducted by Motlatsi Thabane (2000:638–648) on the social and environmental effects of the project construction on Molika-liko in the Mohale area, for example, pointed out several adverse effects upon human security. Crop production in Molika-liko was a relatively inexpensive undertaking and brought high returns because of soil fertility, the absence of pests and the ability of communities living there to produce in excess of their own needs. The Mohale area was home to a variety of grasses which were good for animal grazing, especially by cattle. The quantity of produce, especially maize and wheat, from their lands was more than sufficient to satisfy the food needs of their dependants and they sold the surplus to finance the children's schooling, clothes and other needs. However, as a result of resettlement the communities suffered palpable losses, the most obvious being the loss of fertile agricultural and good pasture land (Thabane 2000:638–648). As one person resettled from Molika-liko lamented, there they used to eat *papa*, wild vegetables, and milk from their cows, beans and lentils, but in their new resettled area they were starving because the wild vegetables were scarce and so is land to grow beans, peas and lentils (TRC 2004:30).

Many of the affected communities emphasise that the LHDA has not been accountable and transparent, adding that their lives were better off when they lived in their original villages, which have now been taken over by the project. They have expressed grievances over their removal from their original homes, where they did not have to buy wood, herbal medicines, vegetables and other essentials for sustenance. According to some of the affected communities, their present settlements pose serious problems with regard to self-sustenance (TRC 2003:3). This is supported by a socio-economic survey undertaken between November 2000 and March 2001 to obtain baseline data, which found that the project construction has contributed to household food insecurity (*Mail & Guardian* 2005).

The adverse effects of the LHWP on food security was also examined by Sets'abi and Mashinini (2006), who noted that the significant decline in farming as a source of income for the displaced and resettled populations is directly related to three factors. First, the significant reduction in access to arable land by the displaced populations, second, the reduced access to natural capital resources, particularly pasture, which is important in livestock production and third, the significant reduction in draught livestock, which made a considerable input in farming activities. They emphasised that the overall decline in farming as a livelihood strategy has resulted in a loss of income and it may also have led to food insecurity owing to the loss of productive assets related to food production. Sets'abi and Mashinini (2006:143) argue that there is a direct link between the two aspects of reduction of income and food insecurity, because food is principally acquired through personal production or the ability to purchase it.

There can be little doubt about the impact of the project on environmental and human security. A decline in or adverse effect on environmental security in any country does indeed adversely affect human security and vice versa. On the one hand, environmental degradation contributes to amongst others poverty. On the other, human-induced activities resulting from poverty do cause environmental degradation. The construction of the project is a human-induced activity that has resulted in environmental change, which has further exacerbated the problem of poverty and poverty-related environmental activities, setting in motion a vicious circle.

A large part of the problem is directly related to the fact that environmental issues in Lesotho have not yet been adequately politicised, so that they become a concern at the highest political level. As was noted in the preceding sections of this paper, the country pays little attention to the social and cultural impact of the environment when attempting to deal with environmental problems (Sibanda 2003:40). In the case of the LHWP, environmental concerns are often highlighted by civil society groups rather than the state. The project itself is, however, a concern of high politics as far as the design, implementation, operation and maintenance of the project are concerned. But at this stage the hydro-political strategic interests of the political elite of both Lesotho and South Africa outweigh the environmental issues or impacts of the project. The political elite of both states often cite the project as a symbol of peaceful coexistence and security in the region, well knowing that environmental degradation can lead to conflict. Furthermore, little mention is made by political leaders of its adverse impacts on environmental and human security (Mwangi 2007:14–16). As Willemse (2007:470) pointed out:

> Phase IB of the LHWP is a classic example of an insufficient environmental assessment (EA) for several reasons. First, the EA was done hastily because political leaders wished to get the project off the ground as quickly as possible. Second, the project incurred huge negative environmental, social, cultural, religious and economic impacts, which continue to affect many people and regions.

The potential for conflict arising from environmental degradation is as high as that arising from water as a trans-boundary resource. In order to enhance political security in the country as well as the region, there is a need for Lesotho to politicise environmental problems associated with the LHWP.

The construction of the LHWP has caused significant environmental change that has resulted in environmental degradation and consequently adversely affected human security. It has reduced arable and grazing lands, contributed to reduced access to food crops and animal stock, and deprived the affected communities of certain cultural practices while threatening their personal, community and political security. The overall

result has been a deterioration in living conditions, and in some extreme cases, hunger and starvation among the affected families and their livestock. Affected communities are no longer able to enjoy their previous lifestyle and culture by personally providing for their basic needs, as they used to do prior to project construction (Mwangi 2007:14–16).

Conclusion

The LHWP has contributed significantly to environmental degradation in Lesotho and has in the process also adversely impacted on environmental and human security. The construction of the project is a human activity that has depleted renewable resources in the country, both in terms of quantity and quality. Communities affected by the project are no longer able to enjoy their human life, lifestyle and culture through the fulfilment of basic needs, like they used to prior to project construction. The problem is to a large extent political, since the elite of Lesotho have politicised the advantages of the project, rather than dealing with or even acknowledging the environmental problems associated with it. Hence the adverse environmental impacts of the colossal water project are not addressed at a high political level.

There is need for the political elite of Lesotho to securitise, and hence politicise, the adverse environmental impacts of the project as well as the general environmental problems in the country. Political leaders must first and foremost acknowledge that environmental problems and their socio-economic and environmental impacts are a matter of serious concern in the country. Then they must ensure that they have the political will not only to address these problems but to enhance the capacity of the state, both with administrative and legal tools, to tackle these problems. The enactment and implementation of legislation that involves civil, political and state society as stakeholders in the process will enhance the role of the state in the formulation and implementation of sound environmental management policies. Through partnership programmes with relevant stakeholders, the state will be able to mobilise adequate financial and human resources required for the implementation of such policies. Through civic education the state as well as political leaders can sensitise citizens to key environmental issues. By doing so, leaders will also be politicising environmental matters and hence make them concerns at the highest level.

In Lesotho the conservation of the environment should indeed be a matter of high politics or national interest, since environmental degradation is likely to deplete or adversely affect its most abundant resource, namely water. If not properly managed with regard to environmental matters, the LHWP may breed the seeds of its own destruction. Hence there is need for the elite in the country to ensure that environmental politics receive the same priority as the politics of interstate cooperation, peace and security. This will go a long way towards ensuring that human security problems arising from or associated with environmental change are acknowledged and dealt with by the country.

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