16 Role of science in multi-stakeholder processes: A case study in the Central Rift Valley in Ethiopia

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Abstract

Multi-stakeholder platforms have been coined as new forms of cooperation in the face of emerging or actual resource conflicts. Such platforms can serve to resolve disputes, to identify adaptation strategies or to empower the local poor with weakest voice. This paper describes the collaboration of science and the multi-stakeholder platform Central Rift Valley Working Group in promoting integrated land and water resources development and management in the Central Rift Valley of Ethiopia. This region faces different forms of environmental degradation as a consequence of both the uncontrolled economic development and the poor's short-term needs for survival. The Central Rift Valley Working Group acts as major platform for collaborative research and knowledge dissemination to support the sustainable development in the region. Evidence-based knowledge demystified prejudices and revealed various misconceptions with respect to past and on-going developments in the Central Rift Valley. Science has contributed to the understanding that current developments in the Central Rift Valley are unsustainable and that the policy of various stakeholders is part of the problem. In addition, the role of science as knowledge broker and facilitator of new stakeholder alliances was important in stakeholder processes. However, the case also illustrates that policy and development discourses take place at different scales, which are not all easily accessible for science. Interaction of science with stakeholders was useful to verify information and knowledge, to better able to identify locally-supported R&D trajectories, but also to learn to be modest about the role that science can play in complex resource-constraint situations.

16.1 Introduction

Competing claims for land and water and associated environmental problems often occur at spatial, temporal and complexity scales beyond those that individuals are able to address. Multi-stakeholder platforms have been coined as new forms of cooperation in the face of emerging or actual resource conflicts. Such platforms can serve to resolve disputes, to identify adaptation strategies or to empower the local poor with the weakest voice (Warner, 2006). The question is how science can facilitate and contribute to complex societal negotiation processes in multi-stakeholder platforms involving stakeholders with different interest and from different levels of organization (scales).

In this paper we describe and analyze how science facilitated and contributed to the decision-making process of stakeholders in a situation with emerging resource conflicts, specifically on water resources. We use the Central Rift Valley in Ethiopia as a case study because Wageningen UR has been involved in this river basin since 2006 through different projects. In various research activities scientists of Wageningen UR have closely liaised with the Central Rift Valley Working Group to support a policy dialogue on the sustainable development of this basin. The Central Rift Valley Working Group consisting of development professionals is a major platform for collaborative research and knowledge dissemination in the Central Rift Valley.

This paper has a highly narrative character of how science and a multi-stakeholder platform interact in a specific environment. We realize that such interactions between science and stakeholders are often context specific. Yet, we think that it is possible to draw some common lessons on the role of science in multi-stakeholder processes.

First, we describe the study area in more detail and the emerging problems related to resource scarcity that formed the starting point for research involvement of Wageningen UR. Subsequently, we briefly describe the background, organization and objectives of the Central Rift Valley Working Group. The role of science is described using the methodological framework that has been applied to interact and collaborate with stakeholders. Results of various studies that have been conducted are only summarized as they are less relevant than the issue how evidence-based knowledge contributed to stakeholder processes. Therefore, the interaction between science and stakeholders is presented in more detail. The paper ends with an extensive discussion and conclusions on the role of science in multi-stakeholder processes.

16.2 Study area: The Central Rift Valley

The Central Rift Valley of Ethiopia (about one million ha) is situated 150 km southwest of Addis Ababa and is bounded by the east and west by highlands, with altitudes of more than 3000 m above mean sea level. The central lowlands at about 1500 m above mean sea level consists of a chain of lakes connected by rivers with unique hydrological and ecological characteristics (Figure 16.1). Since the Central Rift Valley is a land-locked basin, i.e. there is no surface inflow and outflow of surface water from the basin, various lakes are saline while interventions in land and water resources can have far reaching consequences for ecosystems goods and services (Legesse and Ayenew, 2006). The wide diversity of landscapes and ecosystems comprise extensive wetlands that are rich in biodiversity.

The majority of the population (about 2 million) is originally pastoralists, but the main present livelihood is the small mixed rain fed farming system comprising both cereal and livestock production. Agricultural productivity of these systems is generally low associated with highly variable rainfall (especially in the central lowlands) and low external input levels. As a consequence, part of the population depends structurally on aid through the Productive Safety Net program indicating the extreme poverty and food insecurity.

Over the past decade, economic liberalization and the globalization of food and non-food systems have fostered investments in agriculture in many parts of Africa, including Ethiopia. The Government of Ethiopia embraced these developments within its Agricultural Development Led Industrialization (ADLI) strategy, which forms the cornerstone of Ethiopia's poverty reduction strategy (MoFED, 2006). As part of the ADLI strategy, the Government of Ethiopia and international donors actively support the diversification and commercialization of smallholder agriculture and the development of large-scale export-oriented agriculture, among others in the Central Rift Valley of Ethiopia. Thanks to tax holidays, financing schemes and technical support from both the Ethiopian Government and civil society organizations the area with irrigated agriculture has increased strongly over the last decade, especially near Lake Ziway being the only freshwater lake in the basin.

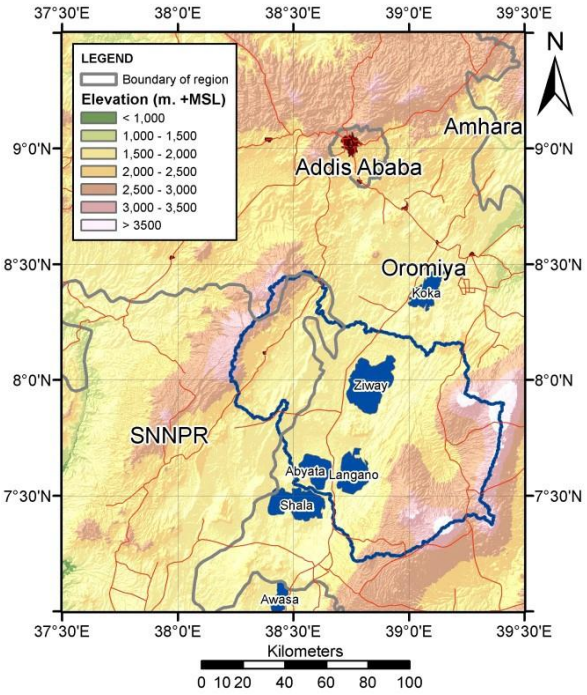

Figure 16.1
Location of the Central Rift Valley and its borders indicated with the blue line.

Recently, surface water levels have dropped across the Central Rif Valley, but most dramatically in Lake Abyata that shrunk to about half of its pre-2000 level (Hengsdijk et al., 2009). Lake Abyata is part of the Abyata-Shala National Park and famous for its water fowl. The basin-wide drop in surface water tables has been associated with the mining of soda ash along the shores of Lake Abyata and the increase in water extraction for irrigation in the Central Rift Valley (Legesse and Ayenew, 2006; MoWR, 2008). In addition, there are a number of other forms of environmental degradation in the Central Rift Valley which are common for other parts of Ethiopia as well and include the gradual erosion of woody stocks, the over-grazing of common pastures and the decreased land productivity in rain fed areas resulting in the expansion of cultivated land to marginal areas.

16.3 Central Rift Valley Working Group

The environmental degradation in the Central Rift Valley, especially the drop in the water table of Lake Abyata received public attention and laid the foundation for the multi-stakeholder Central Rift Valley Working Group, established early 2006 by a group of professionals with a stake in the sustainable development of the area. The objective of the Central Rift Valley Working Group is to promote a basin wide integrated land and water resources development and management approach in the Central Rift Valley. The activities of the Working Group to realize this objective encompass the (i) generation, documentation and dissemination of information and knowledge, (ii) fostering collaborative response to development issues, (iii) lobbying, advocacy and awareness raising and (iv) networking and experience sharing.

The Central Rift Valley Working Group consists of representatives of the public sector (e.g. federal and regional government organizations), private sector (e.g. tourism enterprises), academia, and particularly civil society organizations implementing different types of development projects in the area. The Central Rift Valley Working

Group does not have a formal governance structure and membership. It is rather a loose network of interested organizations and individuals that are devoted to the sustainable development of the Central Rift Valley. Core members take the responsibility for organizing regular meetings, often with rotating chairmanship. Participation in the meetings of Central Rift Valley Working Group is on voluntary basis implying that size and composition of the meetings varies. In the first two years of its existence the Working Group organized 19 official meetings, in which on average 16 members participated. In addition, smaller group meetings were organized, for example, to prepare project proposals or to develop advocacy strategies on specific issues. Two important incentives for attending the meetings are the possibility for networking and the presence of donors. For example, one of the civil society organizations provides funds for demand-driven action research facilitating joint research activities of academia and civil society organizations.

The Central Rift Valley Working Group does not fulfill completely the much used definition of multi-stakeholder platform namely 'a decision-making body comprising different stakeholders who perceive the same resource management problem, realize their interdependence for solving it, and come to agree on action strategies for solving the problem' (Steins and Edwards, 1998). The Central Rift Valley Working Group has no legal mandate in Ethiopia and its members can therefore only decide on joint actions to solve problems of which the solutions are within their control and capacity. Complex issues requiring broad solutions such as new legislation can only be addressed by the federal or regional government. The Working Group can, however, influence government policy through advocacy, lobbying and awareness raising, which is one of the activities of the Working Group to achieve its objective.

16.4 Role of science

The establishment of the Central Rift Valley Working Group was a response to the failure of Ethiopian policy to address the emerging resource conflicts adequately. One of the problems to address environmental degradation properly in policy formulation is the general lack of knowledge and information on resource use, which is also related to the fact that federal and regional government institutions poorly cooperate and share information. The need for generation, documentation and dissemination of information and knowledge is also expressed in one of the major activities of the Central Rift Valley Working Group (Section 1.3).

Mid 2006 Wageningen UR became involved in the Central Rift Valley to give support on sustainable water use, agricultural practices and sound environmental planning and management. The objective was to support and facilitate a policy dialogue with local stakeholders aimed at mitigating the environmental problems associated with the rapid increase in the use of water by agriculture and industry. The Central Rift Valley Working Group was deemed a suitable platform to support such a dialogue, while carrying out research in collaboration with its members.

From the start of the collaboration between science and the Central Rift Valley Working Group, there was a need for more insight of the resource use by different stakeholders and the magnitude of resource degradation through expansion and deepening of the existing knowledge base. Subsequently, improved understanding of resource use and degradation could be used to identify, design and test alternative resource management options in collaboration with stakeholders. Therefore, the NE-DEED framework (Giller et al., 2008) has been applied that consists of four analytical steps feeding into different phases of stakeholder **Ne**gotiation processes, i.e. **D**escribe, **E**xplain, **E**xplore and **D**esign (Fig. 1). These four steps are completed in an interactive and iterative process with stakeholders and assist stakeholders in developing creative and integrative solutions that cross disciplinary borders.

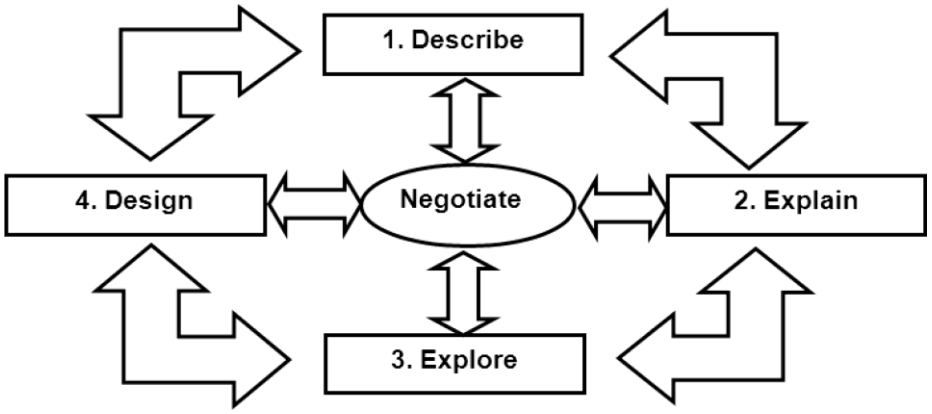

Figure 16.2
Methodological framework to analyze competing claims on natural resources and to support negotiation processes of stakeholders (modified from Giller et al., 2008).

Focus in the first step (**Describe**) is on identifying the various driving forces of the competing claims in an area and the relevant stakeholders. Analysis of the resource base and its dynamics may shed light on the rate of change and future developments under business-as-usual conditions. The second step (**Explain**) aims at better understanding of the resource dynamics and the magnitude of the competing resource claims by developing and applying a suit of simple and complex quantitative approaches. The third step (**Explore**) includes the identification of alternative resource management options including institutional barriers based on scenarios, participatory needs assessments, etc. Step four (**Design**) consists of concerted research and development (R&D) actions aimed at alleviating competing resource claims, improving resource use efficiencies, and getting a process going to address required changes in the policy and institutional system at different levels to provide sufficient innovation space to reconcile competing claims. New insights and knowledge gained in the four steps can support societal negotiation processes that are ongoing in different policy arenas and stakeholder networks in a given conflict situation.

It is beyond the scope of this paper to describe in detail the scientific results that are part of the first two steps of the methodological framework, i.e. **Describe** and **Explain**. Different studies have been conducted often together with members of the Central Rift Valley Working Group that helped to better understand the Central Rift Valley as a dynamic socio-ecological system. Results of these studies can be found in reports, presentations and policy notes available at the website www.crv.wur.nl.
Here, we summarize the major findings and recommendations:

- Recent reductions in the lake levels in the Central Rift Valley are associated with land developments especially the expansion of furrow-irrigated horticulture.
- In contrast with the common believe among stakeholders, the soda ash factory at Lake Abyata nor are the greenhouses in Ziway the major water consumers. Furrow-irrigated horticulture is by far the largest consumer of fresh water resources in the Central Rift Valley.
- There is no evidence that the amount of rainfall in the Central Rift Valley has decreased over the past 30 years. Hence, the rapid shrinkage of Lake Abyata in the last 10 years can not be related to lower rainfall.
- Although furrow-irrigated horticulture provides income to a growing part of the population in the Central Rift Valley, the little information available suggests that its economic performance is generally poor and associated with low water use efficiencies.
- The potential impacts of emissions (nutrients and biocides) from horticulture and floriculture on the surface water resources is unknown and requires further study.

– The rapid expansion of the horticulture and floriculture puts pressure on the available urban and social infrastructure.
– There is an urgent need to identify alternative livelihood strategies for the local population that consume less fresh water resources such as tourism, rain fed agriculture and fisheries/aquaculture.
– Further uncoordinated exploitation of the land and water resources may have dramatic consequences for the local population and development options as the only fresh water lake (Lake Ziway) may become a closed lake resulting in increased salinity levels.

Uncertainty and lack of data hampered quantification, and thus the full understanding of the system, such as the performance of the furrow-irrigated horticulture sector (Van Halsema et al., 2011), or the potential impact of emissions of the horticulture and floriculture sector. Therefore, some of the recommendations were targeted at setting the research agenda, implying a feedback loop in the methodological framework as illustrated by the double-sided arrows in Figure 16.2. Overall, generation of the knowledge base resulted in extensive, although still imperfect knowledge on many aspects of the Central Rift Valley system. However, the newly generated knowledge was sufficiently robust to engage in stakeholder processes.

16.5 Science-stakeholder interaction

Through meetings of the Central Rift Valley Working Group and organization of stakeholder workshops research findings were verified and, if needed local knowledge incorporated before taking the next step of the methodological framework. This process of knowledge verification and generation contributed both to the social learning of participants of the Central Rift Valley Working Group and the broader policy dialogue required for improving natural resources planning, management and decision making in the Central Rift Valley. An important task of science in the descriptive and explanatory steps of the methodological framework (Figure 16.2) was to demystify prejudices and to reveal misconceptions with respect to past and on-going developments in the Central Rift Valley. Some of the findings and conclusions were difficult to accept by members of the Central Rift valley Working Group as they conflicted with government policies, with on-going activities of civil society organizations and with the common believe and opinions of stakeholders. Especially, the finding that the open-field furrow irrigated horticulture sector was the largest consumer of fresh water was an eye opener for many stakeholders and difficult to accept by policy, and by civil society organizations participating in the Central Rift Valley Working Group. The furrow-irrigated horticulture sector consists mainly of smallholders that receive financial and technical support from government institutions and civil society organizations as part of development programs to reduce poverty and to spur economic growth. Other conclusions indicated the need for more research, for example, on the possible environmental impacts of agro-chemicals associated with the increased intensification of agriculture in the Central Rift Valley. This conclusion was more easily accepted by stakeholders but revealed that public institutions in Ethiopia are lacking that are in charge of monitoring water quality. This indicated at the need for new institutional arrangements at a level beyond the acting ability of the Central Rift Valley Working Group.

In general, multi-stakeholder platforms do not automatically lead to solving complex resource problems and the active participation of stakeholders in solutions aimed at alleviating competing resource claims (Warner, 2006). Therefore, a participatory land use planning workshop was organized with representatives of more than 30 local organizations to raise broader awareness of emerging resource problems among those policy makers and other stakeholders that had been less involved in the dialogue, such as representatives of local municipalities, the local water supply enterprise, investors and peasant associations. In addition, the workshop supported policy makers in the development of integrated policies and strategies as part of the Master Plan for the entire Ethiopian Rift Valley being developed by the Federal Ministry of Water Resources (MoWR, 2008). The Ethiopian Rift Valley encompasses the Central Rift Valley but its area is five times larger. One of the institutional changes proposed in the Master Plan is the establishment a River Basin Authority for the Rift Valley

with overall policy responsibility for water management and includes the development and implementation of policies related to the regulation and legislation of resource use (MoWR, 2010). The main objective of the workshop was to jointly develop a vision for the future development of the shoreline of Lake Ziway, including the identification of priority R&D activities contributing to the realization of this vision (Hengsdijk et al., 2009). This explorative phase of the methodological framework (Figure 16.2) resulted in the identification of four priority areas for action-oriented R&D activities talking into account the understanding of resource claims and acting ability of the local stakeholders:

1. A pilot on commercial smallholder horticulture to support the sustainable intensification of the sector, i.e. improving its socio-economic performance while reducing its environmental impact.
2. Water quality monitoring in response to the risks for pollution of fresh water resources by the agricultural intensification in the Central Rift Valley.
3. Buffer zone development along water bodies to conserve soil and water resources and the natural landscape.
4. Tourism promotion as an alternative livelihood strategy for the local population that consumes considerably less water than the agricultural sector. This initiative connected to a larger eco-tourism partnership program whereby several community conservation areas are being established to boost the local economy.

These four R&D areas are currently being implemented in collaboration with local partners and represent the design stages of the framework presented in Figure 16.2. All four R&D areas involve new public-public and public-private partnerships supported by scientific research, and they address different scales. For example, the horticulture pilot is mainly embedded in local development organizations and local government authorities, but the water quality monitoring and buffer zone activities go beyond the local level as they also involve the liaison with the private sector and knowledge of current legislation defined at national level, such as different environmental proclamations and land ownership rights.

16.6 Discussion and conclusions

Systems facing competing resource claims require transdisciplinary approaches across different scales as such systems are used, managed and governed by different groups of people operating at different scales (Giller et al., 2008). Since these groups have often conflicting objectives solutions are complex and involve political considerations and decisions. Collaboration with multi-stakeholder platforms is attractive from a scientific point of view as these institutional innovations have the potential to be problem-solving and to manage conflicts over resources (Warner, 2006). However, in practice these roles of multi-stakeholder platforms are hard to realize for a number of reasons among others because they do no have a legal mandate and they are not all-inclusive, i.e. not all stakeholders participate. This was also the case with the Central Rift Valley Working Group despite our efforts to broaden the group of stakeholders through the organization of a dedicated land use planning workshop.

One important lesson of this case study is that development discourses take place through a variety of platforms and dialogues at different levels of organization (scales). These different discourses can involve (partly) the same stakeholders, but can also involve other groups of stakeholders not aware of each other. In our case the Master Plan for the Rift Valley was developed in parallel with the dialogues in the Central Rift Valley Working Group. We did not only exchange important scientific information with the developers of the Master Plan, but the Central Rift Valley Working Group was also officially invited in the public inquiry procedure for the Master Plan. At a certain stage in the development of the Master Plan the vision was that the Central Rift Valley Working Group could evolve into an advisory platform for the River Basin Authority to be developed for the entire Rift Valley. However, the development of the River Basin Authority is severely hampered by a lack of finances and expertise and thus the advisory platform has not (yet) been established. In this case different

discourses converged, i.e. that of the Central Rift Valley Working Group and the Master Plan, reinforcing on-going dialogues. However, other policy arenas were hard to trace and to access because of the little transparent bureaucracy of governmental institutions in Ethiopia. For example, we were not able to get formal confirmation of a plan from the regional government to expand the irrigated area by constructing a dam in one of the rivers. Damming of this river would significantly increase the risk of salinity of Lake Ziway, and thus potentially undermining the sustainable use of the lake in the future. Until the construction of the dam actually began these rumors could be confirmed. It is rather an art to identify, access and connect the different on-going discourses and, to provide them with evidence-based information.

The question remains whether science did make a difference to stakeholder processes in the Central Rift Valley Working Group and decision-making on issues related to natural resources management. One could be skeptical when looking at the rate of water extraction for irrigated horticulture and the on-going degradation of water and other resources in the Central Rift Valley. Both the public and private sector focus on irrigated agriculture as one of the important means to alleviate poverty and increase economic growth. The stakes are high and many of the civil society organizations participating in the Central Rift Valley Working Group depend on long-term donor funding for the promotion of irrigation as a means to alleviate poverty under smallholders. Science has contributed to better understanding that current developments in the Central Rift Valley are unsustainable and that the policy of various members of the Central Rift Valley Working Group is part of the problem. At least one of the donors in the Central Rift Valley Working Group changed its policy concerning the support of civil society organizations focusing on irrigated smallholder horticulture. Emphasis in the donor program shifted from promoting irrigation towards stimulating water use efficiency and service provision to improve the performance of existing smallholder irrigation.

Maybe more important has been the role of science as 'knowledge broker' and the Central Rift Valley Working Group as 'the floor of the stock exchange' (Sterk et al., 2009). Generally, information networks in developing countries are poorly developed and those in Ethiopia are no exception. Due to the recent Governmental decentralization process in Ethiopia collaboration among the federal, regional and district authorities has not yet been well established resulting in little coherent policies and poorly structured information flows among authorities, but also with other stakeholders from both the public and private sector. Support of science to stakeholder processes in the Central Rift Valley has not only been important for providing evidence-based knowledge enabling to disentangle facts from fiction but also for connecting various stakeholders that did not know each other but had similar objectives and interests. Scientific support also has been instrumental in bringing together stakeholders with conflicting interests facilitating the shared understanding of problems, and the development of new projects aimed at alleviating resource competition. Information exchange and networking among participants allowed building new alliances to jointly identify R&D issues within the own mandate and authority of stakeholders. This led to new public-private-civil society partnerships but also new coalitions among public institutions addressing, for example water quality monitoring, for which institutional responsibility is currently lacking at federal and regional government levels in Ethiopia.

A boundary condition for the fruitful cooperation among stakeholders and science is the long-term commitment of stakeholders, donors and science since no quick fixes can be expected in complex and resource constrained situations. In contrast, rural development in the context of resource competition is a long-term process that requires frequent adjustment of research strategies and approaches. Key for a successful scientific contribution to this process is the nuanced understanding of the complex issues involved through evidence-based analyses, and the continuous debate on the pros and cons of alternatives and options (Giller et al., 2008). The methodological framework used in the case study provided a new role for science. The users/stakeholders are central and analyses need to be continuously updated and elaborated depending on the information needs of the stakeholders. Participation of stakeholders in the data collection and in demand-driven action research increased the relevance and impact of research outputs. Interaction with stakeholders was useful from a scientific point of view as to verify information and knowledge, to better able to identify

promising and locally-supported R&D trajectories, but also to learn to be modest about the role that science can play in complex resource-constraint situations.

References

Giller, K.E., C. Leeuwis, J.A. Andersson, W. Andriesse, A. Brouwer, P.G.H. Frost, P.G.M. Hebinck, I.M.A. Heitkönig, M.K. vVan Ittersum, N.B.J. Koning, R. Ruben, M.A. Slingerland, H.M.J. Udo, A. Veldkamp, C.A.D.M. van de Vijver, M.T. van Wijk and P.N. Windmeijer, 2008. Competing Claims on Natural Resources: What Role for Science? Ecology and Society 13: 1-34.

Hengsdijk, H., A. Groot, J. van Driel, Kidanemariam Jembere, J. van Uum and P. Boone, 2009. Towards a sustainable fiture of the western shoreline of Lake Ziway. Participatory land use plan development workshop, Ziway, December 1-4, 2008. Plant Research International report 234.

Legesse, D. and T. Ayenew, 2006. Effect of improper water and land resource utilization on the central Main Ethiopian Rift lakes. Quaternary International 148: 8-18.

MoFED [Ministry of Finance and Economic Development], 2006. Ethiopia: Building on progress a plan for accelerated and sustained development to end poverty (PASDEP). Volume I: Main Text. Addis Ababa, Ethiopia, pp. 267.

MoWR [Ministry of Water Resources], 2008. Rift Valley Lakes Basin Integrated Resources Development Master Plan Study Project. Draft Phase 2 report. Halcrow Group Limited and Generation Integrated Rural Development (GIRD) Consultants.

MoWR [Ministry of Water Resources], 2010. Rift valley lakes basin institutional set up and capacity building study project. Proposal for establishment of RVLBA and sustainable IWRM plans. Volume 1 main report. Generation Integrated Rural Development (GIRD) Consultants.

Steins, N.A. and V.M. Edwards, 1998. Platforms for collective action in multiple-use CPRs'. Paper presented at 'Crossing boundaries', the 7th annual conference on the International Association for the study of common property, Vancouver, Canada.

Sterk, B., P. Carberry, C. Leeuwis, M.K. van Ittersum, M. Howden, H. Meinke, H. van Keulen and W.A.H. Rossing, 2009. The interface between land use systems research and policy: Multiple arrangements and leverages. Land use policy 26: 434 - 442.

Van Halsema, G., Beshir Keddi Lencha, Mengistu Assefa, H. Hengsdijk and J. Wesseler, 2011. Performance assessment of smallholder agriculture in the Central Rift Valley. Irrigation and drainage (in press).

Warner, J., 2006. More sustainable participation? Multi-stakeholder platforms for integrated catchment management. International journal of water resources development 22: 15-35.