Proposed framework for collaborative research and capacity building programme on water and land management in Ethiopia

D. Merrey,1 Gulilat Birhane,2 Paulos Dubale3 and D. Peden4
1. International Water Management Institute (IWMI), South Africa
2. Ministry of Water Resources (MoWR), Addis Ababa, Ethiopia
3. Ethiopian Agricultural Research Organization (EARO), Addis Ababa, Ethiopia
4. International Livestock Research Institute (ILRI), Addis Ababa, Ethiopia

Summary

This framework is a working document prepared by the International Water Management Institute (IWMI) in collaboration with the International Livestock Research Institute (ILRI), the Ministries of Water Resources and of Agriculture of the Government of Ethiopia, the Ethiopian Agricultural Research Organization (EARO), the Ethiopian Science and Technology Commission (ESTC), Mekelle University (MU), and the Arbaminch Water Research Institute (AWTI).

The first working draft was prepared by IWMI. It was revised based on feedback from the Ministry of Water Resources (MoWR). The current version has been revised in the light of comments made at the workshop.

Introduction

IWMI and ILRI

The International Water Management Institute (IWMI) is an international non-profit research institute. It was established in 1984 as an ‘International Irrigation Management Institute’, but changed its name in 1996 to reflect a broadening of its mandate. Its headquarters is in Colombo, Sri Lanka. In the year 2000, IWMI established a major Africa Regional Office located in Pretoria, South Africa. This reflects the Institute’s substantial commitment to Africa.

IWMI’s goals are:

- to generate new knowledge and tools on water and land use in agriculture that can have a real impact on improving the livelihoods of the world’s poorest people. IWMI specialises in producing new knowledge on integrated land and water resources management and ensuring that it reaches the intended users.
• to complement the efforts of other organisations working on water/poverty issues by providing a multi-disciplinary research perspective covering hydrological, economic, agricultural, health, environmental, sociological and institutional/policy dimensions of water management. All IWMI's work is done in partnership with national, regional and international research organisations and with policy making and management entities that would use the knowledge generated.

• to promote professional development and capacity building in developing countries, which will enable these countries and IWMI's partner institutions to better manage their land and water resources. ¹

• in Africa, IWMI’s specific goal is to contribute meaningfully to improving peoples’ livelihoods through better access to and management of land and water for productive and other uses. This is done through interdisciplinary research in five global research themes. ²

The International Livestock Research Institute (ILRI) is a non-profit institution governed by an international Board of Trustees created in 1995 by the merger of the International Livestock Centre for Africa (ILCA), based in Addis Ababa, Ethiopia, and the International Laboratory for Research on Animal Diseases (ILRAD), based in Nairobi, Kenya. Through the ILCA heritage, ILRI commenced research on livestock management in Ethiopia in 1974. In collaboration with the Ethiopian government, ILRI conducts research in various parts of Ethiopia.

ILRI works to improve the well-being of people in developing countries by enhancing the diverse and essential contributions livestock make to smallholder farming. Two-thirds of the world’s domestic animals are kept in developing countries, and rural smallholders own more than 90% of them. Ethiopia contains more livestock than any other African country. Ruminant animals provide poor farmers with some of the resources they need most: high-quality food, animal traction and transport, manure to fertilise croplands, a daily income through dairying, and insurance against disaster. The management of these animals is highly dependent on water but also greatly affects water supply and quality that people require for many purposes.

IWMI and ILRI are among the 16 food and environmental research centres, known as the Future Harvest Centres, located around the world. Some 60 governments, private foundations, and international organisations known as the Consultative Group on International Agricultural Research (CGIAR) support these centres. As Centres supported by the CGIAR, the common mandate of IWMI and ILRI is to produce international public goods that contribute to poverty eradication.

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² IWMI’s research themes include, integrated water resources management for agriculture, sustainable smallholder water and land management systems, sustainable groundwater management, water resources institutions and policies, and water, health and the environment.
Water resources and agriculture in Ethiopia

Ethiopia has abundant water resources with the annual surface runoff alone estimated to be 122 billion cubic metres (MoWR 1999). However, the spatial and temporal distribution of these resources is very uneven. This is coupled with a wide range of climatic and topographic conditions that create a diversity of agro-ecological and soil conditions across the country. Subsistence agriculture is the dominant activity of the vast majority of the Ethiopian population, providing employment for about 80% of the population and contributing over 75% of the country’s exports. The main cereal crops are maize, wheat, sorghum, barley, millet, and teff, with a total surface of 6.8 million hectares. Livestock is crucial for rural livelihoods in Ethiopia, with 34.5 million head of cattle and 36 million sheep and goats (FAO 2001). However, agricultural production (including livestock) remains far below expectations, with production systems that lead to considerable degradation of land resources. The generally low rainfall with very high spatial and temporal variability limit production, and makes large parts of the country vulnerable to recurrent droughts; the current drought (2002–2003) may have a devastating impact on millions of people. Technological innovation has been less than in many other countries over the past few decades. As a result of these factors, rural poverty is endemic.

To date, the water sector is at a low state of development and the developed infrastructure is performing below expectations (MoWR 1999). There is evidence that the country has sufficient water and irrigable land resources to meet the nation’s domestic food needs and become a major exporter of agricultural produce. However, less than 5% of the irrigable land has been developed, and even this is said to be performing below expectation (MoWR 1999). This creates a critical need for looking at ways of exploiting the irrigation potential of the country. Most of the irrigated area consists of small-scale gravity irrigation using traditional techniques, while in the Awash Valley a few large modern farms can be found. Domestic water use also counts among the world’s lowest, with only 31% of the population having access to safe water supply. This factor, combined with widespread malaria and serious malnutrition, underlies the serious health issues faced by the rural poor.

In addition to shortages of financial and human resources, Ethiopia needs to strengthen its research base as a foundation for developing its water and agriculture sectors effectively. A strong agricultural and natural resources research programme combined with appropriate extension, training and other support services, is an essential pre-requisite for expanding agricultural production. Similarly, to plan and use its water resources in an optimal way, the country needs a strong research programme in integrated water resources management. This becomes even more imperative as the country engages in a dialogue with its neighbours on the Nile Basin Initiative (NBI). Currently, in both the water and agriculture sectors there is significant capacity in some areas, but serious shortfalls in others.

In sum, for Ethiopia to address the wide variety and complexity of water and land management issues it faces, and to fully engage in the management of the Nile Basin waters, the nation must develop a strong indigenous research and water and land management capacity. The major outcome of a recent joint IWMI–ILRI mission to Ethiopia was a recognition by all parties that IWMI and partners like ILRI can make an important contribution to developing a research base, and strengthening local capacity for water and
land research. This paper sets out a proposed framework for collaboration with Ethiopian partners to achieve these goals.

Collaborative research and capacity building programme

The overall scope of the collaborative research and capacity building programme is water and land resources management in Ethiopia. Emphasis will be given to sustainable improvement of agricultural productivity, including livestock and fisheries; to its relationship with human health and the environment; and to water resources management.

The programme, in accordance with the Ethiopian Water Resources Management Policy (MoWR 1999), will be guided by the principles of integrated water resources management (IWRM). Research will be targeted at different scales, from the crop to field, micro-watershed and river basin levels, including trans-boundary issues.

The proposed programme will therefore have four broad objectives:

• to provide short-term support to policy makers, planners and senior managers with tools and information that they can use as they define priorities and develop and implement policies and programmes on poverty alleviation through efficient use of water and land resources. This can be achieved through workshops, training courses, study visits etc.

• to initiate conceptual and practical research on high priority issues, including at least some issues that would have results and benefits in a relatively short period, in collaboration with Ethiopian partners. This research would seek to develop solutions to problems in particular zones or under particular conditions

• to collaborate with local governments and non-governmental organisations (NGOs) to improve their impacts on poverty reduction through practical action-oriented applied research and scaling up of appropriate technologies and management systems and

• to plan and implement with Ethiopian institutions a programme of professional development and capacity building that will contribute significantly to meeting Ethiopia’s medium and long term requirements in terms of land and water resources research and management.

Strategic approach to research programme

Key facets of the basic strategy for the research programme should include:

• development of technologies and approaches to water and land management that are appropriate for Ethiopia. This may include adaptation and dissemination of lessons learned elsewhere for Ethiopian conditions

• emphasis on capacity building within existing institutional entities (these are to be defined by the Ethiopian partners, but will include a broad set of institutions including

the Ministry of Water Resources (MoWR), Ministry of Agriculture (MOA), EARO, Ministry of Foreign Affairs, Environmental Protection Authority, various universities, NGOs etc.)

- in the Nile Basin, work within the Nile Basin Initiative (NBI) framework. It is recognised that it is Ethiopia’s intent to create the necessary capacity to fully serve the nation’s interest with respect to the Nile waters
- support for implementation of the national water resources management and agricultural policies
- inclusion and integration of Ethiopian scientists, policy makers and other professionals into African regional and global activities that have direct relevance to Ethiopia, including Ethiopian participation in global and regional programmes managed by IWMI and ILRI.

Comparing IWMI’s and its partners’ comparative advantage with the needs of Ethiopia, it is possible to envision a very large programme with many different areas of work.

Examples include:

- integrated watershed management
- river basin management
- policies and institutions for land and water management for crop production, livestock and the environment
- improved land management, including soil conservation, soil fertility maintenance, drainage and management of soil problems, rainwater harvesting etc.
- water reuse/wastewater irrigation and peri-urban agriculture
- sustainable use of wetlands
- integrated approaches to land, water and livestock management
- sustainable groundwater management
- health issues related to water, including malaria, bilharzias, nutrition, and drinking water and sanitation
- design and management of large-scale irrigation schemes and other major water infrastructure
- smallholder irrigation design, management, and viability; adaptation and use of low-cost micro-irrigation technologies
- managing tradeoffs between development of water resources for agriculture and environmental impacts such that water resources are developed to their optimal level without incurring unacceptable environmental impacts and
- drought and flood forecasting, climate variability, coping strategies and mitigation.

At this stage it is proposed to develop the future research and capacity building programme around three focal areas as follows:

- Household and farm-level integrated water and land resource management including: water harvesting, domestic water supply, agro-ecological interventions to reduce malaria, livestock husbandry practices, micro-irrigation technologies, land and fertility management; and in peri-urban areas, recycling of waste water in agriculture.
- Integrated watershed and natural resource management including: small-scale irrigation, policies and institutional arrangements at district and community levels,
livestock and vegetation management, water harvesting, irrigation and drainage scheme
design and management, management of soil salinity, conservation of wetlands.

- River basin management including: policies and institutional designs at basin, regional
  and national level; application of decision-support tools for water management;
  large-scale irrigation, livestock and vegetation management; drought and flood
  forecasting and mitigation, climate variability and change and its implications for long
  term productivity.

These areas were generally endorsed by the workshop. As the programme evolves, the
above areas will be prioritised and key research questions identified to address the most
significant water and land management issues in Ethiopia.

Strategic approach to professional development
and capacity building programme

Achieving the level of water and land management research and management capacity
desired by Ethiopia will take a large investment in human resources development and
institution-building over at least a decade. IWMI and its partners can make an important
contribution to achieving this objective, though of course there will be other initiatives at
the same time. Our comparative advantage is in post-graduate research-based education in
co-operation with universities, training of trainers in the use of various tools and
methodologies, policy and strategic workshops and programmes, and support for
institutional reforms in both the agricultural and resources management sectors.

This component of the overall programme could therefore include the following:

In the short term

- Workshops, study tours, and short training programmes for senior policy makers, water
  managers, and researchers aimed at providing tools, skills, and knowledge that could be
  used immediately. These would be designed based on interest and demand.
- Support for MSc and PhD students’ research on topics that are important to Ethiopia
  and within the comparative advantage of IWMI, ILRI and other CGIAR partners.
- Collaboration with NGOs, public and private institutions at district level etc. in field
testing and adapting innovations that will have a direct impact on people’s livelihoods
through better land, livestock and water management. An example is the current
co-operation on treadle pump adaptation with the Ministry of Agriculture.

In the medium to long term

- In co-operation with Ethiopian research institutions and universities, plan and
  implement a programme that combines research, opportunities for post-graduate
  studies (MSc, PhD, post-doctoral), and curriculum development. This could be
implemented in a ‘sandwich mode’, i.e. helping Ethiopian universities to strengthen their own capacity to provide post-graduate training by further strengthening existing links and establishing new ones to universities in other parts of Africa, Asia, Europe, and North America; and co-supervising research by students.

- Assist Ethiopian technical training institutions to improve their curriculum and training skills to impart the necessary skills to technical staff in water and land management.
- Develop and implement joint research projects on the above topics in a way that provides opportunities for on-the-job training.

At the workshop, there was clearly a very high level of interest by all parties in such capacity-building activities.

**Governance**

**Participation**

To achieve its targets, the Ethiopian collaborative research programme on water and land resources requires a well-co-ordinated team of partners and participating organisations. To avoid fragmentation, research projects and activities must contribute to the overall framework. The necessary strategic planning is the proposed role of the Ethiopian National Consultative Committee for Water and Land Management Research.

The research partners have primary responsibility for the output of the overall programme. Participating organisations will collaborate on specific projects and activities, and will be responsible for the outputs from the project or activity. Participating organisations will be drawn from national and regional government agencies, national and regional research organisations (e.g. EARO, ESTC etc.), universities (e.g. Arbaminch, Addis Ababa, Mekelle etc.) and NGOs. The composition of the group of participating organisations is the responsibility of the National Consultative Committee.

**Governance**

The Ethiopian Science and Technology Commission (ESTC) has recently completed a study recommending the establishment of an institutional framework to support water research, somewhat like the arrangements in the agriculture and health sectors. The workshop endorsed the implementation of this institutional framework. It also endorsed the planned research department within the Ministry of Water Resources. However, it is recognised that implementation of these new institutions will take time. Therefore, the proposed Ethiopian National Consultative Committee for Water and Land Research should be established immediately to bridge the gap. The workshop also proposed that a broad Memorandum of Understanding between IWMI and the Government of Ethiopia be prepared as a framework for the collaboration.
The Ethiopian National Consultative Committee will guide the collaborative research and capacity building programme with IWMI and ILRI on water and land management. This will consist of senior representatives of major stakeholders, including the Ministries of Agriculture, Health, and Water Resources; regional government agencies; national and regional research organisations; and universities, in addition to representation from IWMI, ILRI and possibly other CGIAR centres.

The National Consultative Committee’s primary functions are to:

- identify issues and requirements for research and capacity building
- guide the development and promotion of a coherent approach for the research programme
- assist in raising the necessary resources and ensure their proper management
- facilitate the synthesis and dissemination of the research results to the broader stakeholder community through institutional arrangements to be created
- monitor and assess the programme’s achievements
- ensure that the programme is contributing to the larger goals of Ethiopia in the agriculture and water resources sectors.

In the short run, the Ministry of Water Resources has created the core group that organised the December 2002 workshop (this proceedings); this group with some further strengthening could lead the elaboration of the proposed long-term collaborative programme.

**Timeline**

The intent is to develop and implement a long-term collaboration on water and land management research in Ethiopia that has long-term substantial support from strategic donors. The December 2002 workshop has produced an agreed framework for collaboration, reflected in this proceedings, which provides a basis for designing the future programme and proposals to attract funding.

**Resources and funding**

The envisaged programme is ambitious and beyond the financial means of IWMI, ILRI, or indeed the Ethiopian Government by themselves. Therefore, it will be necessary for the partners to develop a strategy for attracting long term funding from interested donors. All of the partners fully recognise the need to raise funds, and will co-operate to do so. The workshop identified the need to approach many kinds of partners for support. The donors supporting the Nile Basin Initiative, among others, may also be interested in providing support to this initiative. The CGIAR Challenge Program for Water and Food, in which IWMI is the lead partner, will be another potential source of funding for research and capacity building through a competitive grant process.
Other relevant Ethiopian initiatives

The following activities were brought to our attention; more may be added at the workshop and as this collaboration matures:

- A recently completed study by the Ethiopian Science and Technology Commission (ESTC) to identify research and development issues and needs for water resources management in Ethiopia for the Ministry of Water Resources. This study has been referred to above.
- The Ministry of Water Resources’ on-going study to determine institutional requirements for integrated water resources management (IWRM) for Ethiopia’s 12 major basins.
- The Ethiopian Agricultural Research Organization has developed concept papers (EARO 2002) on smallholder irrigation, water harvesting, drainage technology, and environment and irrigation.
- The Ministry of Water Resources is proposing to expand the mandate of the Ground Water Development Training Center (10 km south of Addis Ababa) to include water resources in general, and to undertake applied research.

References


