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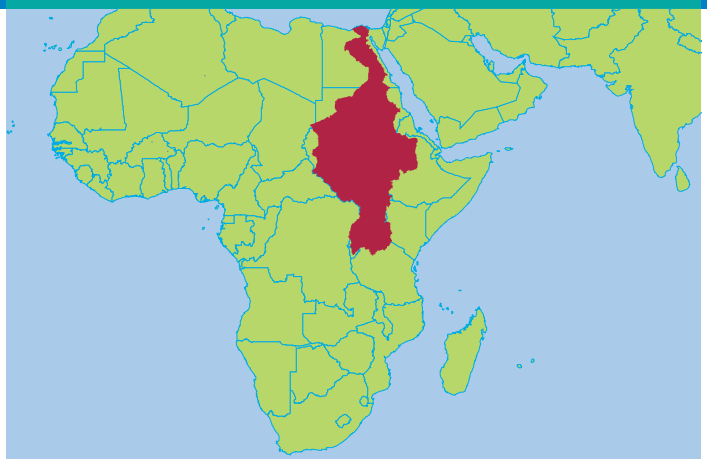
Summary of CPWF Research in the Nile River Basin

February 2014



About the Nile River Basin

- The entire Nile Basin has a population of around 160 million people.
- The Nile Basin covers 10 countries: Burundi, D.R. Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, North Sudan, South Sudan, Tanzania, and Uganda.
- Within the Nile Basin, each country confronts specific sets of water challenges and opportunities:
  - in **Egypt**, sustaining the productivity of irrigated crops in a context of growing water demands
  - in **Sudan**, residue management and livestock as well as improving the productivity of irrigated agriculture, and improving rainfed agriculture
  - in **Uganda**, constraints and opportunities for fisheries
  - in the highlands of **Ethiopia**, rainwater management and land degradation as well as irrigated agriculture and growing competition for water.

Three major river basins flow out of Ethiopia into Sudan, constituting the Eastern Nile basin (the White Nile flows from the south). These are the Tekeze-Atbara flowing out of northern Ethiopia, the Baro-Akoba-Sobat flowing from southern Ethiopia, and the Blue Nile (Abay) sandwiched between the other two. The Blue Nile Basin, called the Abay in Ethiopia, is the largest branch of the Nile draining the Ethiopian highlands. It covers an estimated area of 311,437 km^2 and is shared by Ethiopia and Sudan. It joins the White Nile in Khartoum, Sudan. The Ethiopian highlands portion of the Blue Nile river basin was the focus of the Nile Basin Development Challenge under the Challenge Program on Water and Food.

The Nile Basin Development Challenge

High population pressure and increasing use of marginal land combine to cause land and ecosystem degradation in many parts of the Blue Nile Basin. High sediment loads result in heavy costs for irrigation canal cleaning and reservoir dredging in the downstream countries of Sudan and Egypt. Ecosystem degradation also results in a downward spiral of poverty and food insecurity for millions of people in Ethiopia and downstream countries. Much of the earlier growth in food production came from land expansion in upstream countries and irrigated agriculture in downstream countries. The challenge now is to increase the productivity of rainfed and irrigated agriculture while reversing degradation and sustaining ecosystem services. Given the potential of rainfed agriculture, the time and resources available, and cognizant of various institutional and political constraints, the CPWF Nile Basin Development Challenge (NBDC) decided to focus on the causes and consequences of low rainwater productivity in the Ethiopian highlands.

The aim of the NBDC was to improve the resilience of rural livelihoods in the highlands through a landscape approach to rainwater management. It was implemented by international and national partners working closely with the Ethiopian government following a broad research for development (R4D) approach. R4D involves carrying out scientific research in a participatory and shared learning mode. The major outcome was identification of the critical elements of an approach referred to as a "new integrated watershed rainwater management paradigm". The NBDC was implemented through five projects; the first was a commissioned review of past experiences while the others each had a specific focus as described below.

A landscape approach to research is based on the recognition that people living in complex agro-ecosystems have multiple objectives and priorities. Interventions may have many intended and unintended consequences. Therefore, a participatory learning-oriented systems approach to identifying, testing and scaling up interventions is required to achieve balanced and sustainable outcomes.

Sustainable land and water management: a defining issue

Ethiopia's policies and programs on sustainable land and water management have evolved over several decades and have had important positive impacts on land management and livelihoods. We believe these policies and programs can be further transformed and integrated into a new paradigm. The goal is to enable poor small holder farmers to sustainably and equitably improve their food security, livelihoods and incomes while conserving the natural resource base.

Further strengthening the Sustainable Land Management Program is urgently needed to achieve its full promise and to maximize the benefits from the large investments currently being implemented or planned. Radical changes in policy or implementation are not required. The existing program includes many elements of the new paradigm but they need to be scaled up and made more effective.

The NBDC has made significant contributions to strengthening the scientific foundations of landscape management, improving learning and sharing of lessons from experience, enhancing the capacity of local officials and rural people to plan and implement integrated watershed level investments and to apply new participatory planning tools at the district level, development and use of new modelling and spatial analysis tools at watershed and national levels, and raising policy makers' awareness of options to improve the outcomes of the government's Sustainable Land Management Program.

Implementation of the eight core elements of this emerging paradigm, if implemented in an integrated fashion, will greatly improve the long-term benefits of the Sustainable Land Management Program. At local levels it will enable rural women and men to improve their incomes and livelihoods. At national level it will help raise the rate of agricultural growth while conserving precious natural resources.

Read more

Messages

Extension worker drawing a map

Community members watch information films followed by comment sessions

***1** Local community empowerment and leadership is critically important to achieve long-term benefits and sustainable outcomes of rainwater management programs, especially where collective action is based on demand, equity and inclusiveness.*

Ethiopia's Sustainable Land Management Program has evolved to include a greater emphasis on local participation. The evidence is clear that supporting the trend to focus on empowering local communities, including a stronger emphasis on gender equity and inclusiveness, will increase the sustainability and benefits of NBDC interventions. However, current social and institutional arrangements make the process of large-scale community empowerment extremely challenging.

Rainwater management planning and implementation realities

Official guidelines emphasize that land and water management interventions should be planned and implemented through a participatory process at community and sub-district levels. Local plans are intended to be inputs used to finalize annual implementation plans. However, based on detailed research in the three NBDC field sites, we found that final plans handed from the top-down were not consistent with the locally proposed plans. The final plans are largely based on standardized technology packages and are imposed from the top. Extension agents are given quotas that they must fulfill as their own performance assessments are based on achieving these quotas. To move towards a more participatory program, the study made six recommendations:

1. Shift the focus of targets from outputs to outcomes;
2. Enhance monitoring and evidence collection on rain water management with a focus on impact and sustainability;
3. Revitalize and capitalize on the development agent system;
4. Strengthen local institutions' roles in natural resource management;
5. Move towards more meaningful participation; and
6. Open lines of communication to foster innovation capacity.

Learn more at: http://nilebdc.org/?s=rhetoric

Photos from top: ILRI/Apollo Habtamu; ILRI/Beth Cullen

2 *Partnerships should integrate and share diverse elements of local knowledge and innovation processes and encourage innovation through research for development processes based on scientific excellence. Such partnerships are more likely to lead to sustainable outcomes than local practices or promoting scientific technologies from outside the community.*

Partners are those individuals and institutions directly involved in program implementation. In the NBDC, partners included but were not limited to formal research partners and implementation organizations. The main program implementation partners were the International Water Management Institute (IWMI) and the International Livestock Research Institute (ILRI). One or the other led each of the projects (N2-N5), with the other closely collaborating. National partners played critical roles in each of the projects as well. The NBDC built on existing partnerships and over time new partners became closely involved in the program, for example the recently established Abay Basin Authority, the Tana and Beles river basin organizations, and the Ministry of Water and Energy.

NBDC also attracted and collaborated closely with other projects in the basin. An example is the AfroMaison program, which aims to develop strategies for integrated natural resources management as a means to adapt to climate change impacts (http://www.afromaison.net/). Afromasion piloted a participatory community planning tool in collaboration with the innovation platform members at Fogera, one of NBDC's field sites. Another example is the Challenge Program on Water and Food supported a Research into Use project on uptake of integrated termite management for rehabilitation of degraded rangeland in East Africa. Its goal was to improve the resilience of rural livelihoods of termite affected regions of the Nile River basin through a landscape approach to rainwater management. Its implementation was fully integrated into NBDC research.

Symposium draws on Ethiopian expertise in water management modelling in the Blue Nile Basin

Building on recent results of the N4 project, the Nile team invited representatives from Nile Basin Authority, the Ministry of Water and Energy and the Nile Basin Initiative Decision Support System Office to map their existing modelling work and identify priorities for water resource and agricultural water management modelling in the Blue Nile Basin.

Past and current experiences

Presentations from the Nile Basin Tana and Beles sub-basin authorities, the Ministry of Water and Energy, Bahir Dar University and the Ethiopian Institute of Water Resources highlighted a number of common challenges: obstacles preventing modelling from being more fully exploited or useful in agricultural water management and water resource modelling initiatives; the diversity of modelling tools and their inconsistent use, the lack of good quality data, the insufficient capacity to use existing modelling tools; and the lack of integration of modelling outcomes in planning and implementation strategies.

Ways forward

Key priorities for agricultural water and water resource modelling in the basin relate to scaling issues (integrating small scale practices and large-scale impacts in planning and management), data needs, and uptake and acceptance of model outputs.

Adanech Yared (Ethiopian Institute of Water Resources) introducing her work

To improve uptake of modelling outputs, the participants highlighted several strategies: tailor modelling output messages to different audience categories, develop capacities (both of modellers to communicate their outputs and of end users to use them), and use policy briefs and face-to-face sensitization to engage with intended audiences throughout the process. This symposium was the first of its kind and will, we hope, lead the way to a community of practice among water-agriculture modellers.

Read the full story - See presentations from the event

Photo: ILRI/Ewen Le Borgne

3 ***Strengthening and transforming institutional and human capacities among all stakeholders is a critical requirement to achieve the potential benefits of the Sustainable Land Management Program. This should include a special focus on extension officers (Development Agents) as the front-line champions of the new rainwater management paradigm.***

The remarkable progress made in Ethiopia as a result of its investments in human resources and strengthening institutional capacities is strong evidence in favor of these investments. Well-supervised post-graduate students can play important roles in obtaining feedback on intervention programs as well as contributing to their personal capacity as researchers and practitioners. Capacity development extends beyond more classic but vital support to students to enabling capacities of local community members, Development Agents, regional institutions, and others.

Above:
Protecting soil moisture monitoring sites in Jeldu

Left:
NBDC team discussing sessions

Preparing the next generation

One of the objectives of the Nile Basin Development Challenge was to develop the capacities of various actors, including future generations of decision makers, planners and implementers of land and water management policies and interventions. The NBDC has supported the work of students to develop their theses, a significant milestone in their professional development. The results of their work were an important contribution to the project. Examples include:

- Smallholder farms livestock management practices and their implications on livestock water productivity in mixed crop-livestock systems in the highlands of Blue Nile Basin: A case study from Fogera, Diga and Jeldu districts. https://cgspace.cgiar.org/handle/10568/25115
- Study of smallholder farms livestock feed sourcing and feeding strategies and their implication on livestock water productivity in mixed crop-livestock systems in the highlands of the Blue Nile Basin. https://cgspace.cgiar.org/handle/10568/25114
- The brokerage institutions and smallholder market linkages in marketing of horticultural crops in Fogera woreda, south Gondar, Amhara National Regional State. https://cgspace.cgiar.org/handle/10568/25063
- Analysis of smallholder farmer's participation in production and marketing of export potential crops: The case of sesame in Diga district, East Wollega zone of Oromia Regional State. https://cgspace.cgiar.org/handle/10568/25064
- Communication tools for improved knowledge sharing in rainwater management: A case study of the Nile Basin Development Challenge. https://cgspace.cgiar.org/handle/10568/16981
- Assessment of rainwater management practices for sustainable development and rural livelihood improvement in Andode/Meja micro watershed, Jeldu district, Oromia Region. https://cgspace.cgiar.org/handle/10568/24866
- Physically based rainfall: Runoff modelling in the northern Ethiopian highlands: The case of Mizewa watershed. https://cgspace.cgiar.org/handle/10568/24887?show=full
- Assessing the role of traditional land management practices in improving cropland productivity: The case of Diga Woreda, Oromia. https://cgspace.cgiar.org/handle/10568/24867

National partners expressed a high level of satisfaction with support for postgraduate students and the training and capacity building opportunities.

Photos from top: ILRI/Birhanu Zemadim; ILRI/Apollo Habtamu

4 *A necessary condition for successfully implementing sustainable innovative programs at scale is creating, aligning and implementing incentives for all parties combined with considerations for risk management.*

The current incentive system for extension workers is based on achieving physical targets set at higher levels, often leading to inappropriate interventions. Incentives should be understood in a broad sense, to include formal and informal rewards, for example, public recognition and social networking, opportunities for training, and encouraging innovation while also using risk management mechanisms as poor farmers are highly vulnerable if an innovation fails.

Among other factors, appropriate economic incentives enable a technology to make a meaningful impact at the farm level. Incentives for innovation are important, but more difficult to design. Seed funds to local innovation platforms is one example of an incentive for innovation that NBDC found effective.

Workshop to design strategies at a landscape level

Designing incentives through local innovation platforms[1]

Local innovation platforms were established in three sites in the Blue Nile: Diga and Jeldu Districts in the Oromia Region, and Fogera District in the Amhara Region. Platforms were established following research that found that natural resource planning and implementation at district level was driven by top-down targets, and that local governments struggled to achieve farmer involvement and cross-sectoral integration – both essential ingredients for sustainable land and water management. The platforms aimed to bring stakeholders together (government offices, NGOs, researchers and community representatives) to identify joint solutions to pressing rainwater management challenges.

But what incentives will lead to actions on the ground when the returns on investment in natural resource management are so long-term? To overcome this obstacle, the NBDC team decided to test the use of small grants to kick start activities and encourage people to work together. In 2012, a small grant was provided to each platform on the basis of proposals developed by members to pilot new approaches to rainwater management.

In all three sites, platform members decided to work on fodder planting and control of free grazing. Uncontrolled free grazing was recognized as contributing to soil erosion, while many farmers faced fodder shortages for their livestock. In all sites, government soil and water conservation activities were ongoing, and platform members saw the potential for synergies by controlling grazing to prevent bunds from being trampled and planting bunds with improved fodder varieties to stabilize structures and increase fodder availability. Fodder was planted across a range of land types to determine the best approach: communal lands, private fields and backyards. In addition, the process of developing by-laws for grazing control has begun in all three sites. ILRI and its national partners have provided ongoing training and technical support to these interventions.

Platforms are monitoring the success of interventions, sharing their experiences through farmer field days and planning scaling-up activities for the next year. Although it is too early to identify impacts on soil and water conditions, participating farmers are pleased with the interventions and other farmers have expressed interest in taking up the new fodder varieties. In Fogera, nine tons of fodder have already been harvested, enabling eleven cattle to be fattened for market. Some farmers now see the potential to develop dairy markets.

Transforming longstanding ways of working, particularly fostering participation, is a long-term and politicized process. Over the year, monitoring and research efforts centered on better understanding how political relations play out within an innovation platform and between platform members and farmers. These experiences help us to better understand the incentives for different actors, why they continue to participate in the platform (or not), and draw lessons for the future use of start-up funds for innovation platforms.

[1] https://waterandfood.org/2013/07/16/seed-funds-to-oil-the-wheels-of-innovation-in-rwm-what-have-we-learned/

Photo: ILRI

5 *Adapt the growing number of new models and learning and planning tools along with improved learning processes to increase the effectiveness of planning, implementation, and capacity building.*

Aberra Adie (ILRI) introduces the WAT-A-GAME to farmers

Drawing on the considerable expertise of our partners, the Nile Basin Development Challenge team identified several challenges to effective planning and implementation of rainwater management interventions in its three sites, (Jeldu, Diga and Fogera) in the Blue Nile Basin. Challenges include poor coordination and communication between actors, lack of bottom-up planning and insufficient community participation.

The NBDC team sought to develop and test user-friendly participatory planning and communication tools. These included:

- The use of digital stories and participatory videos http://nilebdc.org/2012/10/03/participatory-video-for-vertical-communication-between-farmers-and-policy-makers/
- Participatory monitoring of hydrological and other processes http://nilebdc.org/2012/03/12/participatory-hydrological-monitoring-in-ethiopias-nile-basin/
- The Happy Strategies game http://nilebdc.org/2011/11/20/happy-strategies-where-strategic-land-and-water-management-is-as-simple-as-playing-a-game/
- and the WAT-A-GAME.

Wat-A-GAME makes waves in the Nile

In December 2012, researchers from AfroMaison and the Nile Basin Development Challenge co-organized a workshop in Fogera to develop landscape scale strategies for improved rainwater management. The aim of the workshop was to use WAT-A-GAME, a participatory planning tool, as the starting point for looking at rainwater management issues at a landscape scale.

WAT-A-GAME is an open toolkit developed by IRSTEA and CIRAD. It enables participants to design and run simulations for water management, policy design and education. It aims to show how water moves within a landscape, and how it is used, polluted, transformed and shared by actors. Using WAT-A-GAME, participants can simulate various actions or strategies and the resulting impacts on their household economy, their well-being, labor, and the surrounding ecosystem. New policies can also be invented and tested. In this workshop, WAG was used to model the Fogera catchment and simulate important rainwater management issues, including water availability, run-off, soil erosion and the impact of different land use practices.

Research conducted by NBDC scientists highlighted a disconnect between farmers and decision makers in terms of perceptions about natural resource management problems and ideas for solutions, which is compounded by a lack of communication and understanding between the different actors.

The role-playing exercises and subsequent discussions helped raise awareness about upstream and downstream connections and landscape interconnectedness. Regional and district staff learned about farmers' knowledge and priorities, and vice versa.

Read the full story

Photos from top: ILRI/Beth Cullen; ILRI/Zerihun Sewunet

6 *Strengthen integration among multiple rainwater management interventions at watershed and basin scales.*

Ethiopia has a long history of promoting single interventions, for example stone terraces, bunds, and below-ground tanks, but there is strong evidence these often do not produce good results. Far greater benefits over a longer period will accrue if an integrated approach at watershed level is used, identifying an appropriate mix of interventions for different zones. NBDC experience with participatory planning tools has shown that this multiple intervention strategy is feasible. Private on-site benefits by themselves may not provide sufficient incentives for farmers to invest in rainwater interventions. Where the benefits accrue elsewhere, an appropriate incentive strategy is critical to align benefits and costs.

A basis for strengthening integration[2]

As a starting point, Nile Basin Development Challenge researchers set out to capture the diverse water and land related livelihoods of the farming communities in upstream and downstream parts of the Blue Nile Basin and their impacts on local environments. The research defined and characterized major production systems and associated subsystems, specifically small grain cereals-based mixed crop-livestock and maize-sorghum-perennials systems and their associated subsystems. Researchers then examined water management practices in rainfed and irrigated systems. We also synthesized impacts of these production systems on the environment and upstream-downstream linkages using erosion, sedimentation, livestock and crop water productivity, and soil nutrient balances as indicators.

The evidence suggested that natural ecosystem services such as nutrient recycling and redistribution are severely threatened in the basin. On-site and off-site effects of processes like sediment removal, transportation, redistribution and attendant environmental impacts are highly correlated with the dominant farming practices and human interventions. Also strongly related to farmers' resources are indicators such as water productivity and soil nutrient depletion; farmers' activities to replenish the lost nutrients are often insufficient.

[2] http://cgspace.cgiar.org/handle/10568/25546

7 *Pay more attention to improving markets, value chains and multi-stakeholder institutions to enhance the benefits and sustainability of rainwater management investments.*

There is very strong evidence that we can increase the likelihood of success using market-driven (value-chain) approaches that optimize the benefits for all stakeholders while reducing and sharing costs equitably. For example, stronger multi-stakeholder rural institutions can enhance rural women's and men's share of agricultural profits.

Impacts of brokerage institutions on the marketing of horticultural crops in Fogera District[3]

Fogera District is endowed with diverse natural resources. It has huge potential water sources which are suitable for irrigation during the dry season to produce horticultural crops, mainly vegetables. However, there is a serious market problem in the area associated with the perishability and seasonality of horticultural crops. The role of brokerage activity in the area to address this problem was previously little known.

A Nile Basin Development Challenge team investigated the economic roles played by brokerage institutions in smallholder market links to market outlets in horticultural marketing and what factors determine decisions on whether to use brokerage institutions or not. The focus of this study was on onions and tomatoes.

Researchers found that the brokerage institutions could be characterized as urban, peri-urban and farmer-brokers. There was significant brokerage activity only for onion marketing; in the case of tomato marketing the brokers act as rural assemblers. Most horticultural trading in the area is undertaken through credit and there is much reliance on trust. Brokerage institutions play an important role in linking smallholder farmers to market outlets.

Smallholder farmers using brokerage institutions earn about 4,393 Ethiopian Birr (USD 331) higher net income and market about 14 percent more of their surplus than smallholders who do not use brokerage institutions. These results suggest that it would be helpful to formalize brokerage institutions through licensing, training and continuous follow-up.

[3] http://nilebdc.org/2013/12/15/a-glimpse-at-the-nbdc-science-impacts-of-brokerage-institutions-on-the-marketing-of-horticultural-crops-in-fogera-district

8 *Pay more attention to the downstream and off-site benefits of rainwater management in addition to upstream or on-farm benefits and costs.*

Participatory approaches to tackling power and representation in innovation platforms

In many cases, the greatest benefits of an upstream intervention go to downstream stakeholders and not to the upstream farmer. Indeed, some research shows that the costs often exceed the benefits to the implementing upstream farmer. Therefore, where the benefits of sustainable land management investments are a broad public good, then private upstream investors need appropriate motivation. Where public benefits are higher than private benefits, there is a role for government action. More research is needed to quantify the distribution of benefits as a means to identify fair cost-sharing approaches. The government's Sustainable Land Management Program is likely to generate substantial benefits downstream but this needs to be documented carefully, as a basis for identifying possible funding mechanisms (for example Payment for Ecosystem Services, found in other regions). This also highlights the critical importance of developing a strong scientific foundation for rainwater management investments.

Nile BDC science meeting reviews emerging research findings

In July 2013, the Nile Basin Development Challenge hosted a science meeting to share its research results. Sixty participants met and reviewed findings organized around four main themes:

- Livestock and irrigation
- Water productivity, hydrological and erosion modelling
- Rainwater, land and water resources management
- Institutions, adoption and marketing

Some important lessons were drawn from the meeting:

- NBDC has produced important new insights into a wide variety of challenges and opportunities facing the Blue Nile Basin; and most of the basic field research and modelling was done by Ethiopian students co-supervised by the national and international NBDC team members.
- Innovative technical, institutional and communication solutions and tools have been identified and tested. These include new approaches to reducing termite damage, innovation platforms, participatory planning tools, new GIS data sets which are publicly available, and new user-friendly open-source higher level planning models.
- The research for development approach adopted by the NBDC and other basins in the Challenge Program for Water and Food is valuable, but has not gone as far as planned, especially in terms of getting beyond research outputs towards development outcomes.
- NBDC research has tended to focus on individual or household benefits of certain rainwater management interventions, but more attention must be given to collective benefits and tradeoffs between upstream and downstream communities. The debate about on-site and off-site benefits and the links with ecosystem services at landscape level remains open.
- Competition for water resources brings into focus a new phenomenon: it is traditionally easier to promote individual technologies rather than collectively managed schemes with high transaction costs.

The participants also highlighted a series of research gaps that ought to be taken up by future initiatives focusing on land and rainwater management. These include: appropriate land use planning, strengthening local agencies to deal with rainwater management and plan land use, identifying suitable scalable solutions that are appropriate for a given context or focusing on scalable practices and methods or approaches; and improving biomass production.

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Photo: IWMI/Valentine Gandhi

Selected Outcomes

From livestock-water towards consolidated rainwater management solutions [4]

The NBDC stakeholders have learned lessons and changed in terms of methodology development, and working approaches, particularly in terms of moving from discipline-based research towards integrated landscape management. Partner national and regional research institutes have started to develop projects and programs in rainwater management and to invite NBDC for closer interactions. The rainwater management concept is bringing together non-traditional partners and also strengthens the links between CGIAR centers operating in the region. For example, ILRI and IWMI started with one joint appointee and have now more than eight national and international joint appointees working on these same initiatives. The ILRI-led LIVES project aims to further strengthen water-centered research in crop-livestock systems in the region.

[4] http://nilebdc.org/tag/msc/

Crop livestock systems in Gallessa near NBDC site

National platform group work

Photos: ILRI

National platform building on land, water and natural resource management: momentum for change [5]

Following careful analysis and consultation with stakeholders, the Nile Basin Development Challenge team organized a workshop in 2011 to initiate a national platform along with key national players to facilitate innovation and link research with action. We brought on board more than 80 people from 55 organizations and institutes, representing politics, government, research, NGO, CBOs, the private sector and donors. The establishment of a national platform was widely supported, especially by the Minister for Natural Resources Management in the Ministry of Agriculture. He indicated they had been waiting for such an initiative for more than 10 years. There was overwhelming agreement that a well-designed national platform can be a mechanism to minimize duplication of effort and enhance communication among and between actors and across sectors for improved land and water management in the Nile Basin and beyond. Regional research centers have since initiated their own platforms bringing universities, research institutions, bureau heads and local policy makers together. Discussion is now moving towards integration with the government's Sustainable Land Management Program, which will effectively institutionalize the national platform beyond the project.

[5] http://nilebdc.org/2011/04/22/nbdc-organizes-national-platform-meeting-with-ethiopia-partners/ and http://nilebdc.org/2013/11/19/nbdc-closing/

Innovations in project and event planning and reporting

Within the Basin, we used an 'open wiki' accessible to all project staff and visible to all (http://nilebdc.wikispaces.com/). The wiki proved to be a highly successful platform for sharing plans and information needed to coordinate NBDC. As of early December, 2013, there were over 250,000 views, 2,500 unique visitors per year, and 2,000 edits over the past three years. The significant changes in researchers' perceptions and behavior have resulted in the adoption of new tools by most staff and the gradual willingness to share on these platforms instead of the traditional email conversations. Stakeholders have a richer knowledge base on which to draw and everyone can contribute to ongoing project activities.

Lessons learned through program implementation

The project's theory of change and tools (outcome logic models, monitoring and evaluation) must be clearly communicated and internalized

In our case, insufficient effort was made to use these tools in program management and there was insufficient ownership by the partners. R4D only became the foundation of a theory of change as the project evolved.

R4D differs significantly from the normal understanding of applied research as understood and practiced by most CGIAR centers and their national partners

It requires researchers to play new roles, cede considerable control of the research to the partners, and requires new skills. In order for R4D to succeed, it is necessary to articulate a clear understanding of what it is, how it should be implemented, and the roles of partners. Partners must come to a shared understanding of R4D; otherwise it will have different meanings for different people, based on their own disciplines, experience, and institutional homes.

Program design and implementation

Project structure can either lead to teams working in silos with insufficient collaboration and communication across projects or working as a multidisciplinary team. Regular monthly project meetings can help. Synthesizing research findings and lessons learned into main messages also fosters a sense of working together towards a common goal.

Pay attention to gender in the program design

Gender is a salient dimension of power relationships in any society. Achieving greater gender equity is an important policy goal and takes considerable investment in time and effort to effect changes. There tends to be powerful subconscious as well as conscious biases among implementing agencies (including researchers) as well as stakeholders and partners. A well-rounded team will have gender specialists in senior positions.

A project needs strong partnerships with individuals and key institutions, both national and international

In most cases the NBDC experience has strengthened partnerships and adapted well in terms of incorporating new partners where relevant. National partners especially appreciated the support for postgraduate students. It is important to involve national partners from the earliest stages of project or program design, sort out financial issues in a timely manner, and provide space for national researchers and partner institutions to play leadership roles.

Don't make promises you can't keep

It's easy to make promises at the beginning of a project but the project will lose credibility if it fails to fulfill all those promises in the limited time period of a program. Remember that most things always take longer than planned.

Not all innovations are the same.

We made a distinction between the innovations that characterized the NBDC process itself, and the specific rainwater management innovations that emerged from the program. NBDC produced promising innovations and useful knowledge with future potential. The potential impacts of integrating R4D with implementation processes is one of the most promising, as are the participatory planning tools, user-friendly GIS tools, and integrated modelling. Implementing the R4D process itself in a context characterized largely by traditional research for development has been an important innovation in the sense that it has changed knowledge and attitudes and may be leading to new behaviors.

Knowledge management and communication

It is worth spending time to strengthen internal program communication and the knowledge sharing culture that supports effective communication. This requires strong leadership and clear management support as changing the behavior of researchers is critical.

Read more

CPWF Nile projects in Phase 2

Learning about rainwater management systems: reviewed past and ongoing activities, and identified lessons learned and gaps in knowledge as a foundation for planning NBDC (completed in 2010).
N1 read more

Integrating technologies, policies and institutions: developed integrated rainwater management strategies at micro-watershed level – to slow down land degradation and reduce downstream siltation; and is pilot testing participatory modes of community engagement.
N2 read more

Targeting and scaling out of rainwater management systems: sought to better target or 'match' promising technologies with particular environments, thus overcoming the limited success and impact of many past agricultural development efforts (completed in early 2013).
N3 read more

Assessing and anticipating the consequences of innovation in rainwater management systems: quantified the consequences of improved rainwater management, and measuring downstream, cross-scale consequences of successful innovation in the Ethiopian Highlands.
N4 read more

Catalyzing platforms for learning, communication and coordination: provided a multi-stakeholder platform for all the projects in support of improved communication, innovation, monitoring and evaluation (M&E), and adaptive management; managed by the Basin Leader as an overall coordination and communication project.
N5 read more

Partners
Abay Basin Authority Amhara Regional Agricultural Research Institute (ARARI) Catholic Relief Services-Ethiopia (CRS) Deutsche Gesellschaft for Internationale Zusammenarbeit (GIZ/SLM) Ethiopian Economic Association (EEA) Ethiopian Evangelical Church Mekane Eyesus Development and Social Services Commission (EECMY-DASSC) Ethiopian Institute of Agricultural Research (EIAR) Ethio-Wet Land and Natural Resource Association HUNDEE-Grass Root Development Initiative International Livestock Research Institute (ILRI) Institut National de Recherche en Sciences et Technologies pour l'Environnement et l'Agriculture (IRSTEA) International Water Management Institute (IWMI) Ministry of Agriculture (MoA) Ministry of Water and Energy (MOWE) National Meteorological Agency (NMA) Oromiya Agricultural Research Institute (ORARI) Overseas Development Institute (ODI) Research-Inspired Policy and Practice Learning in Ethiopia and the Nile Basin (RiPPLE) Stockholm Environment Institute (SEI) University of Ambo University of Bahir Dar University of Wollega World Agroforestry Centre (ICRAF)

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Ref: Clayton, T., Merrey, D., Duncan, A., Langan, S., Harding, A. and Le Borgne, E. 2014. Summary of CPWF Research in the Nile River Basin. Addis Ababa: Challenge Program on Water and Food.

About CPWF
The CGIAR Challenge Program on Water and Food was launched in 2002. CPWF aims to increase the resilience of social and ecological systems through better water management for food production (crops, fisheries and livestock). We do this through an innovative research and development approach that brings together a broad range of scientists, development specialists, policy makers and communities, in six river basins, to address the challenges of food security, poverty and water scarcity.

The CPWF is part of the CGIAR Research Program on Water, Land and Ecosystems. WLE combines the resources of 11 CGIAR centers and numerous international, regional and national partners to provide an integrated approach to natural resource management research. The program goal is to reduce poverty and improve food security through the development of agriculture within nature.
This program is led by the International Water Management Institute (IWMI).

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