

Report of the

CGIAR/IFAR-IWMI Sabbatical Attachment
September-November 2003

By:

Bancy M. Mati

Visiting Scientist
IWMI-Africa

International Water Management Institute (IWMI)-SA
141 Cresswell Street, Silverton 0184
Private Bag X813
0127 Silverton
Pretoria, South Africa
Tel. 27 12 8459100
Fax. 27 12 8459110
e-mail: b.mati@cgiar.org

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List of Acronyms

<u>Abbreviation</u>	<u>Meaning</u>
A-AARNET	ASARECA - Animal Agriculture Research Network
AfDB	African Development Bank
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CGIAR	Consultative Group for International Agricultural Research
CPWF	Challenge Programme on Water and Food
ECA	Eastern and Central Africa
ESA	Eastern and Southern Africa
FAO	Food and Agricultural Organization of the United Nations
IARC	International Agricultural Research Center
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
IFAD	International Fund for Agriculture and Development
IFAR	International Fund for Agricultural Research
ILRI	International Livestock Research Institute
IWMI	International Water Management Institute
JKUAT	Jomo Kenyatta University of Agriculture and Technology
NAREs	National Agricultural, Research and Extension Systems
NARS	National Advanced Research Systems
NGO	Non Governmental Organization
NRM	Natural Resource Management
RELMA	Regional Land Management Unit
RSCU	Regional Soil Conservation Unit
SA	South Africa
SAT futures	Strategic Assessment of commodity and market Trends
SLP	System-wide Livestock Programme
SSA	sub-Saharan Africa (excluding South Africa)
Sida	Swedish International Development Cooperation Agency
SSI	Smallholder System Innovations in integrated watershed management
SWMnet	Soil and Water Management Research Network
WAC (ICRAF)	World Agroforestry Centre

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Thank you.

Bancy M. Mati

Executive Summary

The CGIAR/IFAR (Consultative Group for International Agricultural Research/ International Fund for Agricultural Research) with the financial support from the World Bank/AfDB (African Development Bank), provided a Fellowship of ten thousand US dollars (\$10,000), to facilitate Dr. Nancy Mati of Jomo Kenyatta University of Agriculture and Technology (JKUAT) of Kenya, participate in a sabbatical attachment programme as a Visiting Scientist at IWMI (International Water Management Institute). The attachment was for 2.5 months, between September and November 2003, spent at IWMI's offices in Pretoria-South Africa, ICRISAT (International Crops Research Institute for Semi-Arid Tropics) station in Bulawayo-Zimbabwe, ILRI (International Livestock Research Institute) campus in Addis Ababa-Ethiopia and SWMnet (Soil & Water Management Research Network) based at the World Agroforestry Centre (ICRAF) in Nairobi, Kenya. The purpose of the attachment was to learn how these organizations work and to help build research initiatives between them. Dr. Mati found that:

The CGIAR/IFAR Visiting Scientist fellowship programme was an effective way of catalyzing closer interaction between scientists from NARS, IARCs (International Agricultural Research Centers), networks and other organizations. It particularly provides a forum and time completely devoted to the development of collaborative research activities, which would otherwise be difficult or slow to achieve under normal working conditions. The author found that this enabled her to work closely with experienced and respected scientists of the CGIAR system at IWMI, ICRISAT and ILRI as well as at SWMnet and RELMA. All were willing to collaborate and work on joint activities between their respective organizations.

On networking, it was found that the link between IWMI and ILRI was quite strong, as IWMI is housed by ILRI at their Addis Ababa campus. In addition, the two organizations have held joint workshops and have planned joint activities including implementation of a Challenge Programme on Water and Food (CPWF) project, and research in the upper Nile catchments. The link between IWMI-Africa and ICRISAT-Africa was not that evident with few previous activities, but now there is a CPWF up-coming project and collaborative activities in the Limpopo River basin. SWMnet, being a nascent organization has had some amount of mentoring from IWMI with the latter being represented in SWMnet's Steering Committee. However, SWMnet is very strongly linked to ICRISAT, which hosts the organization in Nairobi, but a direct link with ILRI was not evident. RELMA being a non-IARC and non-NARS has had little direct interaction with the other organizations with the exception of SWMnet, but with RELMA joining ICRAF in January 2004, this will mean easier links with other IARCs. The proposed collaboration through knowledge base development will also strengthen the networking.

The sabbatical attachment was an excellent opportunity to complete pending papers, write concept notes and reports as well as access literature from hard copy and electronic formats. It provided a chance to learn more about livestock and water productivity as well as crop-livestock-water interactions under smallholder and semi arid agricultural systems in sub-Saharan Africa. It also facilitated dialogue towards collaboration between IWMI, RELMA and SWMnet on the development of the knowledge base of best practices in water and nutrient management. The sabbatical attachment has produced four concept notes for regional

collaborative initiatives/projects. An IWMI research report and a journal paper have been prepared, and three country profiles for Ethiopia, Kenya and Tanzania completed. The author would like follow up on the implementation of the projects developed during this attachment viz. (i) Knowledge base development, (ii) facilitate development of the CLWAP full proposal and its implementation (iii) development of the Community water management as a full paper and/or some baseline surveys on the topic, and (iv) continue with the implementation of the Intensify Rainfed Agriculture in Africa project.

The well defined research themes of IWMI, ICRISAT and ILRI indicate complementarities that promise a good scope for networking. For instance, ICRISAT's Crop-Livestock and Diversification theme has objectives that closely complement IWMI's Theme Two on Sustainable Smallholder Land and Water Management Systems, and ILRI's Themes One and Five, on targeting opportunities and People, Livelihoods and Environment respectively. Whereas ICRISAT intends to deliver "high quality crop residues and dual-purpose varieties for improved meat and milk production; high quality, toxin-free grain for poultry and ruminants; options for improving and diversifying feed resources in semi arid tropics systems and enhancing supply of and access to safe livestock products; and diversified income generating options to improve livelihoods", IWMI is committed to addressing the water issues on the same through "improving the productivity of water, addressing impacts of degradation in marginal areas on food security, scaling-up of water, nutrient, and social and institutional implications of promising systems and replication of the same over large areas. Meanwhile, ILRI targets opportunities and priorities where better livestock management can help reduce poverty, while ensuring that people, livestock and environment research that endeavors to ensure that livestock production is balanced with other required ecosystem goods and services and that livestock keeping has minimal harmful impact on the environment and human health.

The need for setting up information bases was especially expressed by the other organizations visited, viz. SWMnet and RELMA. IWMI has also shown keen interest to develop knowledge bases of water and nutrient management, and there is need to start from the known, using experiences available at NARs and NGOs. This provides an opportunity for building links with these organizations and enhancing their capacities, while also avoiding duplication of efforts. Even SSA is awakening and databases are meant for use not only now but also for the future. Thus, whereas recognizing the limitations in computer power and internet connectivity in the region, all the organizations favour electronic databases, but these should be backed up with hard copy formats wherever possible.

Another observation is that previous research by IWMI has concentrated mostly on crops, particularly irrigated crops in Asia. As IWMI is the global leader on research in agricultural water management, the lack of enough data on the livestock sector at IWMI is an opportunity that begs for attention in SSA. It is necessary to bring forth new knowledge in water productivity of livestock, and especially the socio-economic productivity, which is rarely evaluated. Furthermore, available information on water productivity of livestock has been based on research in developed countries, with intensive systems where the water used to grow feeds can be accurately allocated as such, and with results that show very poor water productivity of livestock enterprises. This fact is being disputed by researchers at ILRI, by considering that livestock in sub-Saharan Africa utilize feeds such as crop residues, for which water is used

primarily for crop production, and grazing systems that have low opportunity cost means that water productivity can be shown to be higher, even exceeding that of many crops. Moreover, the crop-livestock-water interaction under smallholder systems is taking new shape with various innovations in SSA that show high productivity of agriculture, and better sustainability. But the impacts at the watershed or river basin level still remain unknown. Whereas ICRISAT and ILRI have approached this at farm-level and community scales, IWMI has the necessary infrastructure to introduce the watershed dynamics that further provide information for sustainable water management.

A common feature of smallholder agricultural enterprises in SSA is that about 70% of the food production is by women. In traditional systems where livestock is grazed on rangelands, men take a leading role in the management on livestock. However, under smallholder mixed crop-livestock systems, particularly where animals are stall-fed, women are the main caretakers, ensuring the production of food and feeds, feeding and watering the animals, milking them and especially caring for young and small stock. Thus, women are the major producers of livestock products, and the decisions they make can have major impacts on the sector. Participatory research in the crop-livestock-water sub-sector will of necessity have to include women researchers for realistic contribution by the farming community, which is predominantly female. Moreover, most communities in SSA have cultures that inhibit women from interacting with men, making it imperative to have a certain level of gender sensitivity. However, the three IARCs visited did not seem to have an equivalent gender balance, being highly skewed in favour of men researchers and scientists. This type of imbalance should be addressed.

One aspect of the CGIAR system is the delineation of research mandates across commodities and disciplines. It is common to find that, in some cases, there are overlaps which may have caused friction in the past. For instance, water management under rainfed agriculture is IWMI's mandate as much as ICRISAT's. On the other hand, water management under livestock production is as much IWMI's as ILRI's business. Collaborative activities that bring together the IARCs to tackle the issues in an integrated manner are important in bridging the boundaries. Moreover, the new system of competitive bidding for funding, that brings together two or more IARCs to conduct research on a theme of mutual interest is another way of reducing this type of competition.

Another issue was that of funding. The Visiting Scientist is expected to be a senior scientist from one of the NARS. Due to the massive brain drain in the region, good scientists are still in great demand and have busy schedules, serving in various committees, working groups and therefore much is demanded of their time. However, it is also well known that scientists are poorly remunerated as few NARS in SSA pay good salaries. Even then, they still have high profile in society and are expected to stay in decent hotels when they travel, and they also have families to support. In addition, the costs of hotel accommodation and food in many cities in SSA, such as Nairobi and Addis Ababa are high and the US\$60 per day paid as subsistence allowance on this sabbatical attachment was not enough. Even the token US\$1,500 per month is far from attractive, considering all the time one has to be away and keep on hold all other activities. For this reason, the organizers should consider increasing the allowances in the future.

Another constraint faced during this attachment was that the time allocated was too tight. This applied especially to the attachment phase with other IARCs like ICRISAT and ILRI, where only one week each had been allocated respectively. This did allow enough time to familiarize fully with the activities of the organization, or even interact with a wider number of scientists. There was no time even for a field visit, which would have been useful in bringing practical aspects into perspective. Therefore, it is advisable to increase the time spent at respective CGIAR centers to at least two weeks each, instead of the current one week, to allow enough time for better orientation and preparation of joint activities, and the sabbatical attachment should be at least 12 weeks. The inclusion of more than one IARC and non-IARCS was beneficial in broadening the collaborative links while also enriching the experiences of the visiting scientist.

From the foregoing, it is highly recommended that the CGIAR/IFAR fellowship programme should continue and expand, in order to enhance capacity of the NARS to interact better at international levels, develop closer intra-IARCs links and between IARCs, NARs and other organizations.

1. Background

In the 21st century, we will see more bridges made across the scientific fraternity, where research will draw strength by tapping into the inherent differences between organizations, while maintaining the professionalism of specialization within each. However, this will only happen if there are enough scientists involved in viable activities that can command the interest of their national governments, the regional organizations they belong to and the international community. The information superhighway has broken national barriers and the red-tape of a few years ago, allowing the sharing of knowledge within and beyond national borders. The www is still a wilderness in terms of getting reliable scientific contacts and information, especially in sub-Saharan Africa (SSA), where poor infrastructure limits internet use, even among scientists. Furthermore, most scientists are overworked and have little time to spend on the internet. For instance, there are only 80 PhD level specialists in Natural Resource Management (NRM) in SSA as compared to 2000 in India alone. This is partly because post-graduate training in SSA has normally relied on scholarships from external funding organizations, with very little contribution by the national governments. Even more frustrating is the lack of opportunities for upgrading scientists beyond postgraduate level. Some of them find that they are given administrative jobs quite irrelevant to their scientific training, further weakening the scientific research capacity of the region. In addition, scientists are poorly remunerated in comparison to administrators and few SSA countries give any incentives or rewards for achievements of scientific nature. The result has been massive brain drain to western countries and low morale locally.

Despite these constraints, there is hope for renewed activity in scientific research in SSA, as the information age brings certain advantages in information flow and cross-border interaction through the current regionalism and globalization. But even these require some level of physical interaction otherwise research can end up being too abstract or theoretical. In the SSA, most scientific research projects have been short-term and lacking in continuity. Due to the poor interaction between scientists, there is much information that could benefit various parts of the region but remains unknown to them. Within the CGIAR (Consultative Group for International Agricultural Research), each institution has a very specific research mandate for commodities they should research on, and with guarded protection against those who seem to infringe on the regulations by crossing the boundary. Most of the CGIAR institutions have activities in SSA, where farming systems normally comprise mixed crop types and livestock. This means that one farmer could relate to about five CGIARs, but these CGIARs may not relate to each other directly until one day they meet in a conference. This mode of operation is expensive in terms of loss of synergies, while it may produce disjointed results, which may be difficult to put together after the fact. It is for this reason that the CGIAR and the IFAR (International Fund for Agricultural Research) have been encouraging more CGIARs to work jointly, for instance as in the Challenge Programme on Water and Food. Within the same time, the CGIAR/IFAR have introduced a Visiting Scientist Fellowship programme, which is aimed at building Scientific research capacity in developing countries as well as catalyzing intra-CGIAR collaboration. This report is the result of the author's CGIAR/IFAR sabbatical attachment with IWMI for a 10-week period between September and November 2003.

1.1 Purpose of the CGIAR/IFAR sabbatical attachment

The purpose of this research attachment was to enable me to a) complete for publication several papers on current research work on rainwater harvesting; b) learn more about what IWMI and selected other CGIAR centers (especially ICRISAT in Southern Africa and ILRI in Ethiopia) are doing and identify where IWMI and the CGIAR centers could work together more effectively; and c) based on this experience, help the CGIAR centers develop a stronger work program for future cooperation.

1.2 Activities, locations and outputs

1.2.1 Phase I - At IWMI-SA

I spent the initial 4 weeks of the CGIAR/IFAR sabbatical attachment (September 8th - October 3rd 2003) at the IWMI office in Pretoria, South Africa. There, I worked closely with IWMI staff, including the Theme Leader for Smallholder Land and Water Management Systems Program (Frits Penning de Vries), and interacted with other IWMI staff, especially Hilmy Sally and also Douglas Merrey, the Africa Regional Director. This gave me an opportunity to become familiar with IWMI's activities in Africa. During this time, I completed three pending IWMI research papers, prepared one concept note and started drafts of two journal papers. I also attended IWMI functions and meetings. In addition, I visited Water for Food Movement projects in the Limpopo Province and attended SSI (Smallholder System Innovations in integrated watershed management) planning meeting. I also prepared the poster on "Farmer Information Supermarket" which was sent to the CGIAR competition on Innovation marketplace.

The outputs during this period can be summarized as follows

- Country Profile –Kenya
- Country Profile –Ethiopia
- Country Profile –Tanzania
- Draft of paper on Isiolo water source mapping
- Draft of paper on Kusa water management
- Concept Note on Knowledge Base of Best Practices in Water and Nutrient Management (see Annex 1).
- Poster on "Farmer Innovation Supermarket"

1.2.2 Phase II – At ICRISAT, ILRI, SWMNET and RELMA

This phase covers three and a half weeks spent as follows:

International Crops Research Institute for Semi-Arid Tropics (ICRISAT) - Bulawayo

I spent one week (6-10th October 2003) at ICRISAT's campus in Bulawayo, Zimbabwe. I worked closely with Steve Twomlow, who is in charge of ICRISAT's international programme on Soil and Water Management. I also held consultations with John Dimes, the soil fertility expert, as well as with Geoffrey Heinrichs, the Center Director. I spent more time developing a concept note for proposed IWMI/ICRISAT/ILRI collaboration then called

“Enhancing Risk Management and Water Productivity in Smallholder Crop-Livestock Farming Systems in Sub-Saharan Africa”, or in short *“CLASP”*. I also spent time reading and making references using the literature from ICRISAT’s publications. The one week was too short to permit many activities, including field trips and I spent all my time on campus.

International Livestock Research Institute (ILRI) – Addis Ababa

The following week (13th -17th October 2003) I spent at ILRI’s campus in Addis Ababa, Ethiopia. There, I spent more time with Don Peden, through whom I learnt a lot about livestock dimensions in land and water management in Eastern and Southern Africa. We developed a concept note entitled *“Improving Productivity of Water for Food-Feed Systems in Eastern and Southern Africa”* or in short *“SLP”* meant for IWMI/ILRI/ICRISAT joint collaboration project. However, after consultations with Steve Twomlow (the week after this one) the SLP concept note was merged with *“CLASP”* to form a new Concept Note entitled *“Improving Productivity of Water for Crop-Livestock Systems in Eastern and Southern Africa”* or in short *“CLWAP”*, (see Annex 2). Again the one week was too short to allow adequate time for interaction or even field visits and I spent all week on ILRI campus.

Soil and Water Management Research Network (SWMnet) - Nairobi

The week 20th – 24th October I spent at Nairobi’s ICRAF (World Agroforestry Center) where I worked closely with SWMnet’s Regional Coordinator, Nuhu Hatibu. I was able to learn about the organization and how it works, and I also participated preparation of documents for the SWMnet Strategic plan and meetings. We were able to meet both Don Peden of ILRI and Steve Twomlow of ICRISAT (both were in Nairobi that week) to agree on the way forward for the crop-livestock concept note.

I also spent an additional three days attending the SWMnet Strategic Planning workshop (Nov. 10-12th) in Nairobi. Thereafter, I prepared a report (see Annex 3). Based on these, SWMnet will take part in all the proposed projects viz. knowledge base, CLWAP, as well as other projects of IWMI such as intensifying Rainfed Agriculture in Africa and Private Sector Investment in Irrigation.

Regional Land Management Unit (RELMA) - Nairobi

RELMA is also based at the World Agroforestry Centre, and is a regional organization that has a long experience in the Eastern and Southern Africa Region, and published extensively on natural resource management and related topics. I had a meeting with the Director of RELMA, Ake Barklund on the issue of IWMI-RELMA collaboration. Our deliberations revealed many areas of complementarities between the two organizations with a conclusion to collaborate on the development of the knowledge base on Knowledge Base of Best Practices in Water and Nutrient Management (see Annex 4).

During this week, I also attended APPIA project launching workshop, took part in the KRA/SEARNET Annual Rainwater Expo, where I exhibited IWMI books and posters. I also facilitated the visit and attended a meeting with Tony Peacock, an IWMI/IFAD consultant.

Activities for CGIAR, CP and others

I stayed in Nairobi two extra weeks which are not counted as part of the attachment period. The first of these (27th October-1st November) I attended the CGIAR annual general meeting in Nairobi, at which I also presented a poster entitled: “*Promoting Best Practice in Water and Nutrient Management for Smallholder Farmers in Remote Areas of sub-Saharan Africa through Farmer Information Supermarkets*” at the Innovation marketplace competition.

During the same week, I organized and took part in other IWMI activities viz.

- Organized and attended the meeting with officers from the Ewaso Ng’iro North Development Authority (ENNDA) on Ewaso Ng’iro proposed collaboration with IWMI
- Organized and attended a meeting on Jennifer Kinoti PhD (IWMI-sponsored).
- Organized MSc student (from JKUAT) participation in knowledge base development.

The second week (2nd–6th November) I spent in Nairobi in the CPWF (Challenge Programme on Water and Food) conference. At which I also;

- Accompanied the International Press to Naivasha for CP location shooting/recording
- Chaired the Opening Session of the CPWF conference
- Made a PowerPoint presentation on Community Water Management

1.2.3 Phase III – At IWMI-SA

This phase has lasted three weeks (13th November-3rd December), when I returned to IWMI’s offices in South Africa. In that time, I have achieved the following:

- Completed the concept Note for collaboration between IWMI/ICRISAT/ILRI now known as “*CLWAP*”.
- Completed the RELMA-IWMI notes for collaboration on knowledge base development
- Completed the SWMnet/IWMI/ICRISAT/ILRI concept note for collaboration
- Completed paper to be improved for IWMI’s Research reports entitled: “*Water Source Assessment and GIS Mapping: Implications for Water Management and Rainwater Harvesting in Isiolo District, Kenya*” or simply known as “*Isiolo GIS and Water paper*” (see Annex 5).
- Completed paper for journal publication entitled: “*Diversifying Water Utilization to Mitigate against Economic Water Scarcity in Kusa, Lake Victoria Basin*” or simply known as “*Kusa water paper*” (see Annex 6)
- Presented a workshop at which I made two PowerPoint presentations (Annex 7) viz.
 - (i) Experiences of the CGIAR/IFAR-IWMI attachment
 - (ii) New Focus on Crop-Livestock Water Productivity in Sub-Saharan Africa
- Held de-briefing meetings with Doug, Hilmy and Frits on the sabbatical attachment
- Wrote final Report.

2. Brief notes on IWMI, ICRISAT, ILRI, SWMNET and RELMA relevant to CGIAR/IFAR attachment

2.1 Notes on IWMI (International Water Management Institute)

IWMI is a non-profit scientific research organization specializing in water use in agriculture and integrated management of water and land resources. IWMI works with partners in the South to develop tools and methods to help these countries eradicate poverty and ensure food security through more effective management of their water and land resources. IWMI is a CGIAR (Consultative Group for International Agricultural Research), center whose vision is *A Food Secure World for All*, while its mission is *Improved Management of Water and Land Resources for Food, Livelihoods and Nature*.

IWMI's head office is based in Colombo, Sri Lanka, and research is carried out through regional offices located in India, Pakistan, South Africa and Thailand. The Institute has staff posted in China, Nepal, Ghana, Ethiopia and Uzbekistan. Research projects are in progress in some 20 countries, across Asia and Africa. In Africa, IWMI's Regional office is based in Pretoria, South Africa, with sub-Regional offices in Addis Ababa-Ethiopia and Accra-Ghana and a project office in Nairobi, Kenya.

IWMI Research Themes 2004-2008

IWMI's work is organized around five research themes. These themes can be seen as five interconnected research missions for IWMI. The work of each theme is guided by an action plan and specific targets to be obtained. The themes are:

1. Integrated Water Resources Management for Agriculture
2. Sustainable Smallholder Land and Water Management Systems
3. Sustainable Groundwater Management
4. Water Resources Institutions and Policies
5. Water, Health and Environment

Through these themes, IWMI intends to achieve strengthened partnerships, develop/generate new knowledge, use of improved tools and technologies, use of improved policies, raised awareness, and enhanced institutional capacity.

Key Messages 2004-2008

- IWMI plans to continue with the development of the Research Agenda, with the five themes being narrowed down to fifteen sub-themes, or key result areas, three for each theme, with corresponding research hypotheses.
- IWMI will continue to expand in Africa, particularly in West and East Africa, and India, matched by reductions in Pakistan and Sri Lanka. Regional commitment in South East Asia and Central Asia will still be maintained.
- IWMI is taking leadership in the implementation of the CGIAR Challenge Program on Water and Food, as well as the other initiatives developed over the last few years.
- There will be continued development of the concept of Benchmark Basins and associated ideas on databases and other global public goods developed and held by IWMI.

- IWMI will continue with further development of the network-based approaches to collaborative research through partners in South and North.

Developing Knowledge on Water and Food

IWMI is one of the world's leading research institutes in the water-food-environment area and has a unique position as an international research organization in this field. IWMI's ambition is to build on its excellence in research to become the leading international knowledge center on the water-food-environment nexus. IWMI plans to be “in the knowledge business” i.e. the world's Water, Food and Environment Knowledge Center, with specific attention for four key Knowledge Roles viz. knowledge generation, knowledge sharing, knowledge brokerage and knowledge Application. The development of the “knowledge base of best practices in water and nutrient management” is in line with these goals. All IWMI's products are international public goods and are freely available e.g. through the internet.

Strengthening partnerships

IWMI has been in the forefront of enhancing research partnerships by providing leadership and support through its programmes viz. the Comprehensive Assessment, the Dialogue on Water-Food and Environment and the CGIAR Challenge Program on Water and Food. In addition, IWMI works with other partners not only to carry out research but also in promoting uptake and application of knowledge through partnerships with NGOs, NARS and the private sector. The proposed IWMI/ICRISAT/ILRI collaborative activities fall within this framework as the three organizations are members of SLP (System-wide Livestock Programme), while the inclusion of SWMNet, A-AARNET and local NARS will boost research collaboration in the project as well as build capacity in the region.

Improving institutional capacity building targets

IWMI has continued to provide institutional capacity building through seven programmes viz. PhD scholarship, Post-doctoral fellowship, visiting scientist program, capacity building of professionals, policy roundtables and policy briefs, workshops and seminars, and institutional capacity building for NARES partners. Partnership with NAREs is enhanced through the involvement of IWMI researchers contributing as resource persons; having NARES researchers brought on board to work in partnerships in IWMI projects with reciprocal input of IWMI researchers in NARES' projects; and introducing opportunities for research students (Masters or PhD). The Visiting Scientist Program comprises Sabbaticals and fellowships offered to experienced scientists from the NARES and private sector organizations to join IWMI for short periods ranging from 6 to 12 months. The CGIAR/IFAR fellowship was part of this initiative and it is hoped that the activities resulting from this attachment will provide opportunities for further capacity building in the region.

2.2 Notes on ICRISAT (International Crops Research Institute for Semi-Arid Tropics)

ICRISAT is a CGIAR center committed to research in the semi-arid tropics to help developing countries apply science to increase crop productivity and food security, reduce poverty, and protect the environment. ICRISAT focuses on the farming systems of the semi-arid tropical areas of the developing world, where erratic rainfall, low soil fertility, and extreme poverty are

formidable constraints to agricultural development. ICRISAT conserves the seeds of 113,000 lines of crops that are important in the diets of the poor: sorghum, millet, groundnut, chickpea, cowpea and pigeon pea and breeds them for higher productivity, resistance to pests, diseases, and other stresses. Through effective technologies, policies, infrastructural development, and the development of human potential, ICRISAT's vision is 'Science with a Human Face', tailoring research to address and resolve real human needs: to reduce poverty, hunger, and environmental degradation, across the semi-arid tropics of the world. ICRISAT's goal is to harness the power of technology for development, food security, poverty alleviation and environmental protection, targeted at poor rural families in general, and women in particular.

The head office for ICRISAT is in Patancheru, near Hyderabad, in the State of Andhra Pradesh, India. ICRISAT has regional Centers in Mali, Zimbabwe, Niger and Kenya providing hubs for staff based at eight locations across Africa and Asia.

Research Agenda

ICRISAT's research strategy is founded on six global themes, viz.

1. Biotechnology
2. Crop improvement
3. Agroecosystems
4. Seed systems
5. Crop-Livestock and Diversification
6. SAT futures (Strategic assessment of commodity and market Trends).

Crop-livestock and diversification

ICRISAT's strategic niche and comparative advantage is in improving the feed component for ruminants and poultry in crop-livestock systems. This aims to provide high quality crop residues and dual-purpose varieties for improved meat and milk production; high quality, toxin-free grain for poultry and ruminants; options for improving and diversifying feed resources in Semi arid Tropics systems and enhancing supply of and access to safe livestock products; and diversified income generating options to improve livelihoods. It has been established that improvement in poor farmers' incomes and the nutritional status of the poor and thus impact on poverty alleviation in the semi arid tropics are firmly based in enhancing livestock productivity. It is this opportunity that was used in developing joint activities with IWMI and ILRI for the crop-livestock-water productivity (CLWAP) proposed project.

2.3 Notes on ILRI (International Livestock Research Institute)

ILRI (International Livestock Research Institute) is the CGIAR centre having a mandate to conduct research on broad range of livestock research issues. ILRI has a mandate to enhance the well-being of present and future generations in developing countries through research to improve sustainable livestock production. It works in partnerships and alliances with other organisations, national and international, in the fields of livestock research, training and information exchange. ILRI was formed in 1994. Its headquarters are in Nairobi, Kenya, with offices in seven more countries around the world.

Goal: By positioning itself at the crossroads of livestock and poverty, and by bringing to bear high-quality science and capacity building, ILRI and its partners will reduce poverty and make sustainable development possible for poor livestock keepers, their families and the communities in which they live. Humankind since the beginning of time has kept livestock, and ILRI believes that livestock systems, if managed properly, play their part in alleviating hunger and counteracting environmental degradation. Well-managed domestic animals can make agricultural systems in the developing world more productive and more sustainable.

Vision: A world made better for poor people in developing countries by improving agricultural systems in which livestock are important

Pathways out of poverty: ILRI undertakes livestock research that contributes to poverty reduction by:

1. securing the current and future assets of the poor
2. sustainably improving the productivity of agricultural systems of the poor
3. encouraging participation of the poor in livestock-related markets.

ILRI's Research Themes: This research is organized around five collaborative themes:

1. Targeting opportunities and priorities where better livestock management can help reduce poverty.
2. Enabling innovations to ensure that research results reflect the needs of the poor and are effectively used to reduce poverty.
3. Market opportunities to help poor farmers benefit from global and national economic growth.
4. Biotechnology to help secure the assets of the poor through activities such as conservation of animal genetic resources and development of vaccines to safeguard poor farmers' livestock assets.
5. People, Livestock and Environment research that endeavors to ensure that livestock production is balanced with other required ecosystem goods and services and that livestock keeping has minimal harmful impact on the environment and human health.

The proposed project for collaboration with IWMI and ICRISAT falls across all the themes. In addition, ILRI and ICRISAT have a formal agreement on a project of this nature, which had planned to include IWMI so as to capture the water management dimensions of the project. In addition, ILRI leads the SLP (System-wide Livestock Programme) of which ICRISAT and IWMI are members.

2.4 Notes on SWMnet (Soil & Water Management Research Network)

SWMnet is one of the 18 networks and programmes of ASARECA (Association for Strengthening Agricultural Research in Eastern and Central Africa). ASARECA itself was established in 1994 to promote cooperation in agricultural research among ten countries, viz. Burundi, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan, Tanzania and Uganda, which together are referred to as east and central Africa (ECA) sub-region. The mandate of SWMnet is to address regional issues on soil fertility and soil-water

management for sustaining agricultural production and at the same time enhancing the quality of the environment in the ECA. SWMnet works in all the ten countries of the ECA and has a Regional Coordinating Unit based in Nairobi, Kenya,

Vision: Land and water resources in ECA are utilized sustainably to reduce poverty through profitable agriculture.

Mission Statement: to assist stakeholders in the ECA sub-region to access and widely utilize the best, locally or globally generated, knowledge, information and technologies on soil and water management, through effective networking and collaboration between national, regional and international organizations.

Overall Objective (Goal): to enhance productivity, value adding and competitiveness of the agricultural system in ECA, for improving livelihoods while enhancing the quality of land and water resources.

Strategic Objective (Purpose): to increase the availability and utilization of knowledge, information and technologies for enhancing the productivity and conservation of soil and water resources for agriculture in ECA.

Strategic Components

SWMnet's will operate through four Strategic Components (SC) that are well linked and complementing, viz.

1. Developing and maintaining an effective regional coordination and collaboration mechanism for soil and water management in ECA.
2. Strengthening the capacity of NARES for research and development in integrated management of soil and water resources.
3. Enhancing the brokering, sharing and utilization of soil and water management knowledge, information and technologies across ECA.
4. Research Agenda - Facilitating the generation of demand driven knowledge, information and technologies on integrated management of soil and water resources.

SWMnet therefore offers opportunities to the proposed collaboration with IWMI, ICRISAT, ILRI and RELMA through its official mandate to network the NARs and other organizations in the sub-region, with a wide support. It is this networking strength that these partners should link to and use as a bridge to the sub-region. The commitment of SWMnet in its mission statement, to access and make available to its stakeholders, global knowledge on soil and water management, is an attractive opportunity for collaboration.

2.5 Notes on RELMA (Regional Land Management Unit)

RELMA is a regional organization supported by the Swedish International Development Cooperation Agency (Sida), promoting initiatives to strengthen the role of small-scale land users in order to enhance food security and reduce poverty. RELMA was born in 1998 out of the former Regional Soil Conservation Unit (RSCU), which was also Sida supported and had been promoting soil and water conservation activities in the Region from 1982. RELMA

operates mainly in six countries in Eastern and Central Africa viz. Eritrea, Ethiopia, Kenya, Tanzania, Uganda and Zambia.

RELMA is based at the World Agroforestry Centre (ICRAF), in Nairobi, Kenya. Over the last four years, RELMA's focus has shifted from "on-farm" activities only to include marketing, agroprocessing, farmers cooperation and policy, but soil and water management have remained the focus. Currently, RELMA is again undergoing transformation to merge with ICRAF. As from January 2004, RELMA will be the development arm of ICRAF, operating in the same six mandate countries.

Both RELMA and RSCU have a rich information base on natural resource management and smallholder agriculture, totaling about 100 publications in books, technical reports, technical pamphlets, technical handbooks, working papers and workshop reports, as well as posters. Nearly all these publications are in hard copy format. Indeed it can be arguably said that RELMA has the best knowledge-base on soil and water management in the Region. From the foregoing, there are many opportunities that come with research collaboration with RELMA in the ESA region, especially in the development of a knowledge base of best practices in rainfed agriculture as proposed by IWMI.

3. Conclusions and Recommendations

The CGIAR/IFAR sabbatical attachment with IWMI provided a good opportunity for learning, interactions meeting key persons and networking. It enabled me to work closely with experienced and respected scientists of the CGIAR system at IWMI, ICRISAT and ILRI as well as at SWMnet and RELMA. I have received very good logistical support from IWMI, including office space, facilities and my stay at IWMI was quite pleasant. The attachment also provided an opportunity to concentrate and access literature from hard copy and electronic formats. At ICRISAT, ILRI and RELMA, I was able to get books and publications that offered useful references. The attachment was an excellent opportunity to complete pending papers, write concept notes and reports. It gave me a chance to know more about livestock and water productivity as well as crops and livestock interaction under smallholder and semi arid agricultural systems in sub-Saharan Africa. In addition, the exposure has been useful in opening opportunities for the development of the knowledge base of best practices in water and nutrient management, and setting the ground work for the project. Other opportunities such as participating in international conference at Nairobi viz. CGIAR annual general meeting and the Challenge Programme on Water and Food can be linked to my participation in the attachment programme. In addition, I was able to attend the SSI meetings and visit rural farmers in South Africa.

It was found that the link between IWMI and ILRI was quite strong, as IWMI is housed by ILRI at their Addis Ababa campus. In addition, the two organizations have held joint workshops and have planned joint activities including implementation of a Challenge Programme on Water and Food (CPWF) project, and research in the upper Nile catchments. The link between IWMI-Africa and ICRISAT-Africa was not that evident with few previous activities, but now there is a

CPWF up-coming project and collaborative activities in the Limpopo River basin activities. SWMnet, being a nascent organization has had some amount of mentoring from IWMI with the latter being represented in SWMnet's Steering Committee. However, SWMnet is very strongly linked to ICRISAT, which hosts the organization in Nairobi, but a direct link with ILRI was not evident. RELMA being a non-IARC and non-NARS has had little direct interaction with the other organizations with the exception of SWMnet, but with RELMA joining ICRAF in January 2004, this will mean easier links with other IARCs. The proposed collaboration through knowledge base development will also strengthen the networking.

The CGIAR/IFAR fellowship attachment therefore provides a catalyst to encourage dialogue and setting up of collaborative activities between the target IARCs (IWMI, ICRISAT, ILRI, ICRAF), networks (SWMnet) and other organizations (RELMA) for which developing a joint concept note could be hampered or delayed by lack of time by the full-time staff. All the organizations showed willingness to collaborate, and had their own ideas on possible areas of joint action. The attachment has produced four concept notes for regional collaborative initiatives/projects for which there are committed scientists to pursue the funding and ultimately the implementation. An IWMI research report and a journal paper have been prepared, and three country profiles for Ethiopia, Kenya and Tanzania completed. The meetings held during this attachment period have minutes for which follow up actions are expected. I intend to follow up on the implementation of the projects developed during this attachment viz. (i) Knowledge base development, (ii) facilitate development of the CLWAP full proposal and its implementation (iii) development of the Community water management as a full paper and/or some baseline surveys on the topic, and (iv) continue with the implementation of the Intensify Rainfed Agriculture in Africa project among other things.

The need for setting up information bases was especially expressed by the other organizations visited, viz. SWMnet and RELMA. IWMI has also shown keen interest to develop knowledge bases of water and nutrient management, and there is need to start from the known, using experiences available at NARs and NGOs. This provides an opportunity for building links with these organizations and enhancing their capacities, while also avoiding duplication of efforts. Even SSA is awakening and databases are meant for use not only now but also for the future. Thus, whereas recognizing the limitations in computer power and internet connectivity in the region, all the organizations favour electronic databases, but these should be backed up with hard copy formats wherever possible.

One aspect of the CGIAR system is the delineation of research mandates across commodities and disciplines. It is common to find that, in some cases, there are overlaps which may have caused friction in the past. For instance, water management under rainfed agriculture is IWMI's mandate as much as ICRISAT's. On the other hand, water management under livestock production is as much IWMI's as ILRI's business. The CGIAR/IFAR fellowship attachment helps to break such barriers. Moreover, the new system of competitive bidding for funding, that brings together two or more IARCs to conduct research on a theme of mutual interest is another way of reducing this type of competition.

One of the main constraints faced during this attachment was that the time allocated was too tight. This applied especially to the attachment phase with other IARCs like ICRISAT and

ILRI, where only one week each had been allocated. This did not give enough time to familiarize fully with the activities of the organization, and none at all to allow for a field visit. A field visit would have been useful in bringing practical aspects into perspective. Another issue was that of funding. In addition, the costs of hotel accommodation and food in many cities in SSA, such as Nairobi and Addis Ababa are high and the US\$60 per day paid as subsistence allowance on this sabbatical attachment was not enough. Even the token US\$1,500 per month is far from attractive, considering all the time one has to be away and keep on hold all other activities. For this reason, the organizers should consider increasing the

From the foregoing, the CGIAR/IFAR fellowship programme is highly recommended to enhance capacity building of the NARS, and develop closer links between different IARCs and between IARCs and other organizations.

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