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Australia Awards Short Course – Irrigation and Water Resources Management for Agriculture 2018

Recommendations from the Symposium on Irrigation and Water Resources Management: Achieving Impact for Africa

Ibadan, Nigeria 25 March 2019



The Symposium

A one-day symposium on Irrigation and Water Resources Management (IWRM) was held at the International Institute for Tropical Agriculture in Ibadan, Nigeria on the 28th of March 2019. Experts from Nigeria, Ghana and Cameroon met to discuss IWRM in Africa with the aim of producing a set of high-level recommendations to address current issues in the sector. The symposium was attended by over 150 delegates from all sectors in the irrigation industry. These included extension agencies, researchers, farmers, academics, politicians and policy makers as well as representatives from the private sector.

The purpose of this document is to inform leading international and national government and non-government organisations throughout Africa on the actions required to foster practical adoption of sustainable IWRM for improved food security across Africa.

Working groups discussed two major areas where support and intervention is urgently needed:

- Socio-economic barriers
 1. Policy and Governance
 2. Social Equality
 3. Economic Issues
- Technical barriers
 1. Technology
 2. Knowledge Transfer
 3. Environment

Executive Summary

Improving the sustainable development and management of Africa's water resources has the potential to substantially enhance food security and food sovereignty as well as the nutritional quality of food across Africa. Despite Africa's vast water resources (present as both ground and surface water), many of these are currently not developed and the few that are often are under-utilised, suffer poor irrigation efficiency, and may not be sustainable in the medium-term.

Major current and emerging activities are needed to address:

Socio-economic barriers

The identified socio-economic barriers to the sustainable development of irrigation relate to three main areas: Policy and Governance, Social Equality, and Economic Issues.

Relevant policy formulation and decision-making is found to be generally top-down, and not taking sufficiently into account the expertise and technological capacity required for effective implementation and the social factors within the operating environment. The result is a general lack of awareness of relevant regulations, which are often difficult to comply with for the end users. **A bottom-up approach to consultation**

and policy making, and more effective and readily available information and education on regulations are needed to address this gap.

Women, youth and minority groups are heavily involved in agriculture and often depend on it more heavily for their livelihood than men, yet they are often not represented in decision-making bodies at any level and receive fewer opportunities for education. **Therefore, achieving proportional and relevant representation in decision-making bodies related to irrigation and water resource management must be a priority at all levels of government, business, the education system and the community. Consultation strategies must be designed that are sensitive to the needs of these groups.** In particular, better funding must be given to the education system to help address these problems and provide training to these groups.

While many of the economic issues in the agricultural sector stem from social inequality, **an agribusiness-focused and entrepreneurial mindset should be fostered among farmers** to promote sustainable intensification of the sector. **This should be supported by access to suitable and end-user appropriate technology and as well as credit facilities.** Sustainable intensification would not only support increased food production and access, but generate improved economic benefits for communities.

Technical barriers

Despite a large body of knowledge about irrigation technologies and good practice in IWRM, many, if not most irrigation schemes are poorly designed, implemented and maintained. Technical barriers include: technological limitations, ineffective knowledge transfer, and environmental concerns.

There is a significant disconnect between potential end-users of irrigation technology, and both the public water management authorities and the private sector. This disconnect means that there are significant barriers to technology adoption due to various factors such as cost, expertise and security. **It is imperative that baseline studies are carried out to assess the technological needs and capacities of communities. This must be followed by promoting the availability of user-friendly and scalable technological solutions and providing culturally sensitive training on their use.** It is clear that the private sector must take on a greater role in this regard, which is an advantageous solution for both communities and agribusinesses.

Most theoretical knowledge of IWRM resides within the tertiary education sector or public agencies, however this knowledge is not being successfully transferred to agricultural communities. Enhancing the curriculum and improving practical knowledge of IWRM in secondary and tertiary education institutions can lay the foundation for the environmentally sustainable and economically profitable development of the irrigation sector. **The**

Train-the-Trainer model should be adopted by both the public and private sectors to facilitate knowledge transfer. For this knowledge transfer to be effective, it must be user-oriented, sensitive to the needs of the communities, and assists in the breaking down of social barriers (such as gender, disability and race). This requires meaningful collaboration between educational institutions, water management authorities, extension agencies and the agribusiness, opening up the potential for public-private partnerships (PPPs). It also requires increased funding for educational institutions to provide the resource-intensive practical training demanded by the sector.

Environmental concerns are generally caused by poor knowledge of proper water management and irrigation techniques, as well as the inequitable distribution of water resources. **A strongly collaborative effort between water management authorities, scientists, extension agencies, law enforcement agencies and farmers groups is needed to:**

- **Accurately assess the water resources available to a community;**
- **Promote best-practice IWRM among farmers;**
- **Promote and enforce equitable and environmentally sustainable water use, and;**
- **Prevent environmental damage (e.g. nutrient run off, salt accumulation, or overexploitation of water resources).**

In particular, crop-livestock interaction is a major obstacle for the implementation of irrigation projects. The ingrained cultural differences between agriculture and livestock farming often places these two systems in competition for water resources, with livestock grazing regularly damaging irrigation systems and fields. **A strategic and community-focussed mediation approach is needed to reconcile these two systems, prevent livestock damaging irrigated fields, and ensure that irrigation is also used for fodder production, thus benefitting all.**

Cross-cutting issues

It is imperative that each of these barriers and recommendations be considered within the context of the “triple bottom line”, i.e. that the development and intensification of agriculture in Africa be socially beneficial, economically profitable and environmentally sustainable. No medium-term development is possible if IWRM ignores the environment, or if communities reject or do not see the benefit of new ways of farming, or if the local, regional and national economies are not strengthened.

The way forward

The implementation of an integrated, efficient and effective IWRM sector across Africa remains weak. This indicates a lack of collaboration between key stakeholders within the sector and shows that policy,

regulation, program design and farmer practice need to be better informed by all actors, in particular through enhanced consultation between policy makers and end users. Despite the inherent differences between the needs of bureaucracies, communities, businesses and policy makers, there are many synergies that can be achieved in IWRM that will ultimately benefit all stakeholders.

To achieve development in line with the triple bottom line (socially beneficial, environmentally sustainable and economically profitable), experts and stakeholders from across the sector must work together to create a strong multi-disciplinary response to these issues and support the sustainable intensification of IWRM in Africa to achieve its full potential.

Below is a full list of the issues identified by the working groups along with recommended solutions.

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1. Socio-economic Barriers	
<i>Problem Identification</i>	<i>Recommendation</i>
i. Policy & Governance	
Non-conformity with Government irrigation regulations by farmers and other stake holders	Periodic review and reformulation of Government policies on irrigation driven by sector-wide consultation.
	Enhance stakeholders' awareness of irrigation regulations and sanctions for non-compliance
	Policy makers must ensure that policy revision and reformulation is informed by technical expertise and realistic adoption potential
ii. Social Inclusion	
Cultural and demographical barriers including ethnicity, gender, age, religion and language barriers hinder the development of irrigation projects.	Women and youth should be given a sense of ownership by having equal representation in decision making and advisory bodies at all levels
	Youth and women should be involved in land-use decision making to overcome traditional land ownership conflicts
	Women and youth should be adequately consulted in the periodic review and reformulation of irrigation policy.
	Water management including irrigation should have a higher priority in secondary and tertiary education institutions. This is to ensure that young people understand that water management is a cross cutting issue and affects all.
	Corporations and their representatives should place greater emphasis on interacting with women and youth
iii. Economic Issues	
Rural to urban migration driven by land use conflicts, lack of interest in agriculture and poor infrastructure obstruct investment in the irrigation sector	Employment in agriculture should be promoted as a business and not as a subsistence occupation.
	Training on irrigation technologies should be entrepreneurially focused and geared towards creating business
	Create incentive systems for farmers to encourage technology adoption.
	Governments, NGOs and the private sector should work together to create easy access to credit facilities
	To minimise and share risk, insurance schemes should be developed. They should be funded by farmer contributions and managed by credible and accountable organisations.
	Eradicate corruption to ensure that investment gets to the intended beneficiaries.
2. Technical barriers	
<i>Problem Identification</i>	<i>Recommendation</i>
i. Technology	
Technology is not end-user friendly and, expensive and end-users do not receive sufficient training in its use. Technology remains largely inaccessible to women, youths,	Promote the use of community/participatory demonstration strategies for technology sharing
	Cost of irrigation technology and required expertise should be matched to farmers' interest and ability

persons with a disability and minority groups	Donor projects should be required to address adoption by end-users
	Provision of technology and training programs should be designed to overcome cultural barriers such as religion, ethnicity, gender and age
	Irrigation technology should be designed to be scalable and suitable to the needs and situations of communities
	Foster collaboration between law enforcement agencies, farmers groups and community leaders to create a secure environment for irrigation technologies
ii. Knowledge Transfer	
Implementation of irrigation technology often fails due to a lack of interaction between end-user, extension and training providers.	Prior to engaging in training and capacity building, cultural and adoption barriers should be identified to develop appropriate knowledge transfer and technology deployment strategies
	Training in the irrigation sector should have a hierarchical structure emphasising knowledge sharing through different levels of the train-the-trainer concept
	Better educate the community on the long-term value of irrigation infrastructure to assist in prevention of theft/vandalism
	Better educate private sector on end-user needs to ensure that water management technologies and strategies should be demand driven (bottom-up approach).
	Increase funding to educational institutions so that sufficient resources can be provided for large-scale practical training programs
	Establish information centres where individual stakeholders can access information
iii. Environment	
Irrigation reservoir degradation due to siltation, eutrophication and agro-chemical pollution.	Establish synergies between agencies and their activities regarding agricultural water management.
	Enforcement of laws, regulations and water restrictions within defined buffer zones
Overexploitation of the water resource, damage caused by erosion of flooding	Link catchment water balances to irrigation demand and water availability.
	Optimisation of water use and leaching requirement in the more arid zones to avoid salinization.
Upstream – downstream water use conflict including land use conflict between crop and livestock farmers.	Increase irrigation efficiencies through improved infrastructure and maintenance using user-pays system.
	Increase water use efficiencies by matching crop and soil requirements with suitable irrigation technology.
	Seek alternative water sources e.g. rainwater harvesting, water re-use, redirecting streams for agriculture, regulate groundwater utilization, development of small-scale shallow aquifers, use of semi-centralized water management for domestic and other uses
	Ensure ideal water parity upstream and downstream
	Reduce mineral fertiliser use through incorporation of organic waste materials as fertilisers
	Mediate between crop and livestock farmers to ensure mutually beneficial distribution of water resources and prevent livestock grazing on agricultural land, and create a regulatory environment to reflect this
	Ensure adequate access to water for domestic use in communities to alleviate competition for water resources

