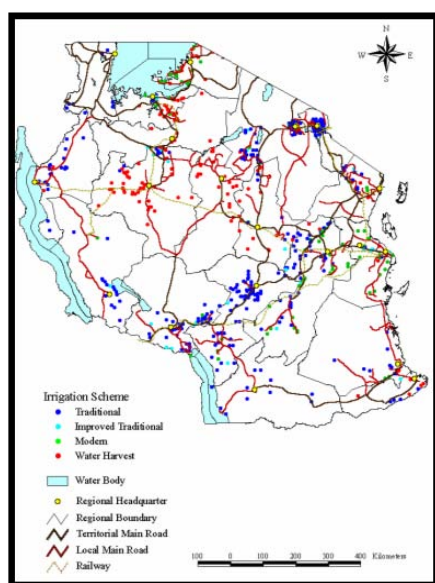


**Investing in improvements to existing community managed river diversion irrigation schemes can lead to gains in water productivity and household income. Infrastructure improvements, coupled with a watershed management approach, farmer training, micro-credit and marketing, can make a significant contribution to Tanzania's poverty alleviation and development goals.**

### The opportunity

Agriculture accounts for 45% of Tanzania's GDP, nearly 30% of its export earnings, and employs over 80% of the nation's work force. The government has identified irrigation as one of the key strategies for growth and poverty reduction in the national poverty reduction framework. Initiatives, such as Kilimo Kwanza, aim to increase the irrigated area to 7 million ha by 2015. The sector also intends to improve paddy yields from the current average of 2 tons/ha to 8 tons/ha. While optimistic, these goals are technically possible if the right policies and farm-level mechanisms can be put in place.

Irrigated agriculture in Tanzania is dominated by smallholders. A 2002 survey found 1,189 irrigation schemes covering a total area of about 192,000 ha throughout the country (Figure 1).



(Source: MoWI, 2002)

Over 90% are 'traditional' irrigation schemes, which are initiated and managed by farmers. They are characterized by poor infrastructure, poor water management and low yields. Water use efficiency estimates range from less than 15% to 30%. These schemes are based on river diversions and typically use traditional furrows for the production of fruit and vegetables in the highland areas, and simple water diversion schemes in the lowlands for paddy. The traditional schemes that have not received any external intervention are classified

## COMMUNITY MANAGED RIVER DIVERSIONS IN TANZANIA

*Based on a report by Bernard Keraita*

as "unimproved traditional irrigation schemes", while those that have had some external intervention, like construction of intake and main canal, are classified as "improved traditional irrigation schemes".

### The research

Researchers working under the AgWater Solutions project in the first phase conducted a thorough literature review and a rapid rural appraisal across five administrative regions, involving over 200 farmers from 10 irrigation schemes. In each scheme, interviews were conducted with the leaders of the farmers' organizations and other key players like micro finance institutions and agricultural officers.

In the second phase, three representative communal irrigation schemes, in Mvomero District in the Wami-Ruvu Basin, were selected for in-depth studies: one unimproved traditional scheme in Hembeti (30 ha), one improved traditional scheme in Mkindo (60 ha), and one formal scheme in Dakawa (2000 ha). The aim was to quantify the socio-economic impacts of irrigation on households in the three communities to determine the value of investing in improvements to traditional irrigation schemes.

### Main findings

Investment in the expansion and improvement of traditional irrigation schemes has been identified by the Government of Tanzania as a priority to spur agricultural production and improve livelihoods of poor urban communities. Interviews revealed that government officials have a strong commitment to this goal. Non-irrigating farmers were keen to acquire access to irrigated land, while irrigators prioritized improving scheme infrastructure and expanding their irrigated area.

Tanzania has a lot of potential to expand irrigated areas as less than 10% of the high to medium irrigation potential is currently developed. For example, in the Wami-Ruvu Basin, there are more than 26,000 ha of potential irrigation area around Mkindo and Dakawa where expansion is possible. This could accommodate more than 20,000 farmers who currently depend on rainfed paddy farming. While the irrigation sector has seen some expansion since the last survey in 2002, growth rates have been low, averaging 16,224 ha per year, hindered by inadequate financial resources (Figure 2).

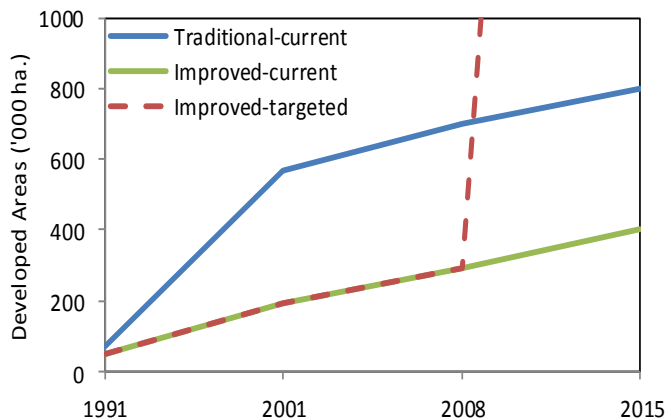


Figure 2. Irrigation coverage gap in Tanzania.

### Potential to enhance productivity in the irrigation schemes

Based on paddy, the crop most irrigated by community managed river diversions, the study shows wide gaps (more than twice) in agricultural productivity between irrigated and rainfed plots and between improved and non-improved schemes. The average paddy yield obtained by irrigators in the improved schemes (Mkindo and Dakawa) was about 6 tons/ha (Figure 3). This corresponds to yields reported from previous studies (6-8 tons/ha) from Mkindo and Mombo, regarded nationally as well-managed schemes. The anticipated national average paddy yield of 8 tons/ha is attainable. However, low yields were reported in the unimproved scheme by irrigators and non-irrigators and in all schemes by non-irrigators. The results are similar to findings from other parts of the country.

Low yields are the results of the poor state (or total lack) of infrastructure in traditional schemes, which hampers the farmer's ability to control and manage water. There are, however, large differences (2-6 times) in productivity among farmers within the same scheme. This suggests that farmers would also benefit from improvements in their farming practices and how they manage the water on their land. Interventions that exclusively address infrastructural concerns may not lead to the desired poverty alleviation.

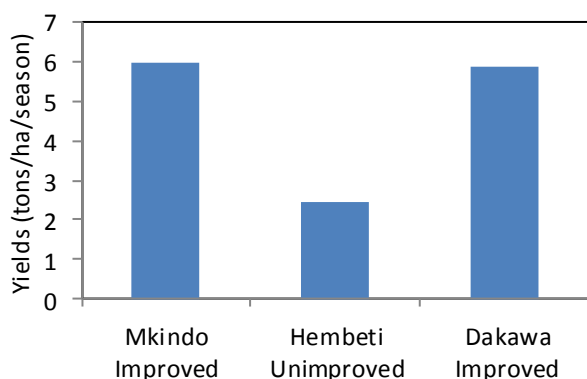


Figure 3. Paddy yields from schemes in Mvomero.

Any proposed infrastructural improvements should be based on sound technological designs and take into account the potential effects on downstream users.

Risk of conflict and resource overexploitation should be evaluated on a case-by-case basis. For example, improving intakes may not always be the best course of action.

### Potential to enhance livelihoods

The study showed that farmers irrigating in improved schemes (Mkindo and Dakawa) earned considerably more than those in unimproved schemes and that irrigators earned more than non-irrigators (Table 1). Irrigation revenues from community managed river diversions contributed more than 85% of household incomes in irrigating households.

Table 1: income from paddy grown in traditional irrigation schemes

	Income (US\$/day)	
	Rainfed farmers	Irrigation farmers
Mkindo (improved)	1.61	3.65
Dakawa (improved)	5.16	5.88
Hembeti (unimproved)	0.2	1.64

### Solutions

Researchers suggest implementing the following "triggers for change"

- **Expand and improve infrastructure**, concentrating on off-takes and main canals. This can be based on models used by IFAD's smallholder paddy rice irrigation project in semi-arid and marginal areas, and the World Bank's River Basin Management and Smallholder Irrigation Improvement Project (RBMSIIP). However care should be taken as some community managed river diversions (CMRDs) can be environmentally disastrous, especially at community and watershed levels. A good management plan is required.
- **Enhance extension services**, by offering farmer training in on-farm water management, farming practices, bookkeeping and marketing. Access to markets is generally not the limiting factor for paddy farmers but smallholders tend to sell at the end of the cropping season when prices are low. A micro-credit organization in Mkindo is experimenting with delayed bulk selling.
- **Strengthen micro-credit facilities**, by separating the savings and credit cooperative organizations (SACCOs) from the banking system, investing directly in credible SACCOs, and enforcing transparent terms of lending to farmers.

### Potential Impact

Improved schemes are more productive and profitable and therefore justify investments in existing unimproved schemes. Expanding developed areas, infrastructure improvements coupled with a watershed management approach, and innovative farmer training and marketing offer significant opportunities to increase yields, improve household incomes and contribute to Tanzania's poverty alleviation and development goals.

These findings and recommendations are reproduced here for the purposes of discussion. The AgWater Solutions Project welcomes all comments and suggestions.

These should be directed to [AWMSolutions@cgiar.org](mailto:AWMSolutions@cgiar.org), please write "Tanzania" in the subject line.