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A new decision-support tool finds top spots for boosting livelihoods with water technologies

The Targeting AGwater Management Interventions (TAGMI) tool could support government planners to better target interventions at resource poor farmers in Africa.

STOCKHOLM (3 SEPTEMBER 2013) Africa's smallholder farmers stand to gain from a new online tool that highlights the water management methods most likely to be effective in given contexts. The tool, developed for the Limpopo and Volta river basins, is aimed at guiding decision makers so their choices ultimately help farmers increase their productivity and wealth.

Although there are various proven agricultural water management (AWM) technologies and methods that could benefit farmers in these regions, they are often not employed to their full potential. The tool pinpoints areas with a high likelihood for these approaches to be widely adopted, given favourable conditions.

The Volta basin spans 407,000km^2 of Burkina Faso, Ghana, Benin, Cote d'Ivoire, Mali and Togo, while the Limpopo basin covers a similar-sized area of Botswana, South Africa, Zimbabwe and Mozambique. Millions of farmers in these regions rely on rainfall to water their crops but suffer from high evaporation, variable and uneven distribution of rainfall, prolonged dry spells and occasional flooding. Climate change is making variable rainfall even less predictable in some areas.

"These farmers, who have few resources, often suffer from crop loss due to a lack of rain or limited access to water," explains Dr Jennie Barron, theme leader of Managing Environmental Systems at Stockholm Environment Institute. "With marginal support structures in place, they are not always able to invest in, and benefit from, tried and tested water-management technologies."

The Targeting AGwater Management Interventions (TAGMI) tool, which is available free of charge online, was developed by SEI and partners[1], under the three-year CGIAR Challenge Program on Water and Food's (CPWF) Volta and Limpopo Basin Development Challenge projects. The tool is based on a Bayesian model, which identifies "success" as the likelihood a particular AWM technology will still be in use two years after its

[1] Partners for the Limpopo basin work were: the International Water Management Institute; Waternet; and the University of Witwatersrand, in South Africa. Those for the Volta basin research were: the Council for Scientific and Industrial Research and the Kwame Nkrumah University of Science and Technology, in Ghana; plus the University of Ougadougou and the Institute of the Environment and Agricultural Research (INERA), in Burkina Faso. The Volta basin research was supported by the European Union.

introduction to a target community in a particular location, given the continuation of existing social and biophysical conditions.

Factors, such as labor availability, appropriate skills and community organization are matched with rainfall regimes and distance to markets; all critical conditions that can affect whether or not farmers have the opportunity to benefit from AWM technologies. These factors were selected and developed taking into account the views of farmers, extension workers and other local experts, together with the available scientific data. This collaboration was important because the way projects are implemented and the level of local participation can prove more important than human or environmental capital in determining whether a project will succeed or fail.

The tool covers eighty-five percent of the Volta basin (primarily in Northern Ghana and Burkina Faso), and all the countries of the Limpopo basin (using ground-truthing data from, and lessons learned in, Zimbabwe and South Africa). Based on discussions with stakeholders, it incorporates three agricultural water management technologies: soil and water conservation measures, small-scale irrigation and small reservoirs.

“These groups of technologies are well known and promoted in the two basins, but have not been widely adopted by the majority of those who stand to benefit,” explains Amy Sullivan, CPWF’s Limpopo Basin Leader. “There is considerable potential for scaling out their use.”

All three technologies have the capacity to increase a farmer’s ability to survive dry periods and are widely available and easy to implement. However, each requires a range of conditions to be in place if it is to provide the desired increases in productivity. Policy makers, NGOs or other stakeholders can use TAGMI to determine where particular technologies are most likely to achieve success at district level. After further investigations to confirm that favourable conditions exist on the ground at local level, they can then target farmers in those locations with appropriate financial incentives or policies.

“Different organisations have their own priorities,” says Dr Olufunke Cofie, CPWF’s Volta Basin Leader. “They might want to work in very rural areas, or with different population groups or to concentrate on providing technologies. So, they can use the tool to work out where, geographically, there are certain conditions and then find out how likely they are to succeed if they implement each of the technologies in those places.”

Although the TAGMI project team chose to incorporate three specific AWM technologies for this tool, it could be adapted for others. And if data is available, it is easily transferable to other geographic locations. So far, the tool has been well received by the stakeholders it is designed to help. Dr Charles Biney, Executive Director of the Volta Basin Authority (VBA) described it as “very important”, saying “VBA is very willing to ensure the continuity of the TAGMI tool”. Representatives from WaterAid, IFAD and FAO have also expressed interest in it.

“The technologies in the tool are the ones that were prioritised through our project but other actors and investors might want to test for other technologies, such as nutrient management, tree planting or livestock systems,” explains Dr Barron from the Stockholm Environment Institute. “In principle, you could create a different Bayesian technology model with relevant factors that are critical for success and develop that in the same way as we have done for soil and water conservation, small-scale irrigation and small reservoirs. It has the potential to be very versatile.”