POLICY BRIEF

July 2020
The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

Water use for food and nutrition security at the start-up stage of food value chains

The continuous high rates of hunger and malnutrition in rural communities are a stark reminder that the link between agriculture and nutrition requires strengthening. A stronger value chain is required between seed and plate, particularly in poor households. A four-year Water Research Commission (WRC) project, focusing on study sites in the KwaZulu-Natal and the Free State provinces, explored ways to improve the production of food from homestead gardens while using water effectively. The project makes a number of recommendations to improve the production and nutrition of food produced in homestead gardens.

Malnutrition and the role of homestead gardens

Malnutrition negatively affects all aspects of an individual's life. Households suffer long-term effects and irreversible changes as a result of poor nutrition in early life. Globally, there is a growing interest in strengthening and intensifying local food production initiatives to mitigate the effects of food price shocks.

Homestead gardening plays an important role in contributing to the food security status of poor households in developing countries, including South Africa. Effective water use at the household level would mean increased production of food, which may guarantee an adequate supply and open up selling opportunities of any surplus, thus allowing the poor to enter the agricultural value chain and earn an income.

Agricultural value chains in South Africa are driven by agri-business, with negligible contribution from smallholder farmers, despite the important role that the produce from smallholder farmers play for rural and peri-urban households. Water is very important for value chain development in agriculture, but it is scare. Therefore, water use productivity must be enhanced using climate-smart technologies (CST) so that yield and nutrition outcomes can be improved.

A mixed-method research approach was used for this project to attain a comprehensive understanding and observation of performance of selected technologies. This included the monitoring of field trials and the capturing the observations of farmers and extension officers.

Vegetables rich in Provitamin-A were planted. The concentration of the nutrient along each CST treatment was assessed during planting. this multi-pronged approach to data collection and analysis helped illuminate the processes that might enhance the agency and empowerment of farmers, households and communities in their journey towards attaining improved water and land-use security.

Study areas

The study was conducted in two rural areas, namely Swayimane and Gladstone. Swayimane is located 13 km outside Wartburg in uMrshwathi Local Municipality in the Midlands of KwaZulu-Natal. The community falls under the Gcumisa Traditional Authority. The area has a high rate of unemployment and subsistence agricultural production is an important livelihood activity.

Gladstone is located about 23 km south of Thaba Nchu and it forms part of the Mangaung Metro Municipality. The village falls under the leadership of the Barolong Bo-Seleka Traditional Council.

Both areas are characterised as having a generally older population (older than 40). Study participants expressed frequent ill health, and food insecurity prevailed in both areas. Researchers observed differences in farming systems at the two sites. At the KwaZulu-Natal study area there were smallholder farmers and household food growers present, while at the Free State study area there were only household food growers. In Swayimane, all community members have very big gardens that can be classified as croplands, based on their size (1 to 8 ha). In Gladstone, the garden sizes varied between 0.5 ha to 1 ha.

Main outcomes of the study

Climate smart technologies

CST's implemented in the study included combining in-field rainwater harvesting (IRWH) technology with sound management practices. These included mulching and fertilizer application. (In-field rainwater harvesting comprises small pits or furrows that are dug within farms for collecting rainwater in order to increase the soil moisture and consequently the crop yield). Several types of vegetables (beetroot, cabbage, spinach and sweet potato) were planted.

Results from the on-farm demonstration plots confirmed that the use of appropriate technologies could result in increased yields from homestead gardens. In Swayimane (in the Midlands of KwaZulu-Natal), two demonstration sites recorded increased yields of 45% and 55% respectively. Similar improvements were also observed in the homestead gardens, where a variety of vegetable crops were produced through the use of IRWH alongside recommended crop and soil management practices.

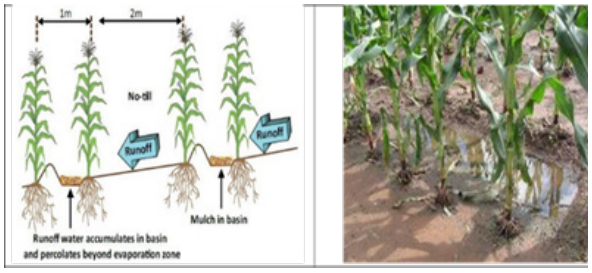

Figure 1. Diagrammatic representation of the in-field rainwater harvesting technique.

At the two homestead garden sites in Gladstone (in the Free State), spinach yield increases of 60% and 96% respectively were recorded, further indicating the benefits of IRWH. The results further showed the benefits of combining IRWH with sound management practices, including mulching and fertilizer application.

The research demonstrated that resource poor farmers can improve yields and thus incomes through the use of IRWH and sound management practices. It is recommended that IRWH be promoted, particularly in low-rainfall areas.

With regards to nutrition, the vegetables that were planted were analysed to if the treatments, agronomic treatments and water use had any effect on nutrient profiles of the various vegetables. Generally, the results imply that the nutrient content of vegetables can be enhanced using different agronomic treatments. The overall nutrient content of the different vegetable types was better when planted under the IRWH technique during the summer.

Facilitating market access

In both areas the traditional authority had to be consulted with regards to access and use of land. Loose and non-identifiable arrangements were found for water use in both areas, indicating a need for intervention. The existing institutional arrangements were found to be too weak for enterprise development. Institutional arrangement for marketing were found to be poor to non-existent.

Although farmers in Swayimane were part of cooperatives, these were for primary production. No secondary cooperatives existed, and crop scheduling was not a concept that was understood. Marketing of crops was uncoordinated and largely at the farm gate, with vegetables being sold mostly to so-called 'bakkie' or van merchants. Unsurprisingly, in both areas farmers struggled to access lucrative markets, despite being close to urban areas that have large retailers and wholesalers for fresh produce. One of the challenges identified was that the farmers generally planted vegetables that were in common demand, rather than looking at niche markets.

The project introduced the concept of Smallholder Horticulture Empowerment Promotion (SHEP) in the two study areas. SHEP is a programme that trains smallholder farmers to adopt a 'market-oriented farming' approach involving shifts to more in-demand crops and adoption of new agricultural practices. Extension officers were trained on the process to assist farmers. In addition, farmers were engaged and training had been scheduled in the participating farmer groups. Farmers already benefiting from

the SHEP model are being identified for farmer-to-farmer learning.

Conclusions and recommendations

The study confirmed that IRWH combined with agronomic management practices, including mulching, increased yields, improved mineral and Provitamin-A in various vegetables. It is recommended that water harvesting technologies, particularly IRWH, be upscaled and supported by extension services and lead farmers.

Increased yields mean that farmers can sell more produce for improved income and improve food security and livelihoods. However, institutional arrangements related to water should be strengthened to improve access to these resources in order to afford farmers an opportunity to improve their opportunities to income.

Market access needs to be improved through improving current value chains and establishing others. The SHEP process is one model that should be strengthened for farmers and extension officers to co-identify opportunities and niche markets for farmers.

Related project:
Water use for food and nutrition security at the start-up stage of food value chains (**K5/2555**). For more information, contact WRC Executive Manager, Dr Sylvester Mpandeli at sylvester@wrc.org.za