Rural women in Mozambique innovate to restore their landscape

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Most of the people living in Mozambique in southeastern Africa depend heavily on the natural resources in their environment for their daily lives. However, in several communities, environmental degradation because of soil erosion is threatening local livelihoods, especially those of poorer households. The problem is particularly severe in the southern part of the country, where water is scarce in the dry season yet floods are common in the wet season.

The Tchemulane Women's Association in Guemulene Community of Chibuto District in Gaza Province of southern Mozambique used their own innovativeness to address the problem of soil erosion in their landscape. They started on their own but later received technical support from two Mozambican organisations - ACTIVA and FONGA, both members of the multi-stakeholder Prolinnova network in Mozambique - not only in making woven-grass bags for tree nursery seedlings but also in constructing low-cost tanks to harvest rainwater for their seedlings and home gardens. ACTIVA (*Associação das Mulheres Empreendedoras e Executivas de Moçambique* / Association of Women Entrepreneurs and Executives of Mozambique), an NGO promoting the role of women in Gaza Province's economic development, supports a large number of women's groups, especially in encouraging women's entrepreneurship. FONGA, the Forum of NGOs for Gaza, provides advocacy and institutional support to local NGOs and associations, in Gaza Province. The Tchemulane Women's Association is a member of FONGA.

The members of the Guemulene Community depend wholly on small-scale crop and livestock farming for their food security and livelihoods. However, the community faces an acute shortage of potable water even if it rains heavily because the water runs off quickly, which leads to severe soil erosion. The community knows the importance of healthy landscapes and manageable water, which are especially important for the women, as they are responsible for fetching water for their families and also for doing the work of cultivation. To protect and restore the landscape and to conserve water, the community wanted to build water-catchment structures and to plant trees on their sloping fields prone to soil erosion.

Women teaching each other how to make seedling baskets

Credit: Gilda Fafitine

Sharing about innovation in Machaila

Credit: Gilda Fafitine

The Tchemulane Women's Association in this community wanted to collect water for their tree nurseries as well as for their home gardens. The private water suppliers charge for water and the women cannot afford to pay. They thought of purchasing a plastic tank and building the required water infrastructure but the costs were prohibitive. For the planned nurseries, they also faced the problems of the high cost of pots or bags for growing tree seedlings and a lack of nets to provide shade for the seedlings.

Locally developed seedling containers

In Mozambique, tree seedlings for nurseries are usually grown in plastic containers, which the community cannot afford to buy. Moreover, these containers are not easily available and have a negative environmental impact. The seedlings need to be watered regularly. In the case of the Guemulene Community, water can be fetched from the Limpopo River, but this is infested with crocodiles. The idea of innovating in the nurturing of tree seedlings came to the group when one of its members, Ms Veronica Sitoe, heard about the making of straw containers when visiting a farmer association in Machaila Community in Chigubo District in northern Gaza Province. There, she met Ms Flora Joaquim Baloi, who had developed this local innovation, and she saw how the local association members were making baskets using straw. Ms Sitoe then remembered that one of the factors that prevented the Tchemulane Women's Association from growing their own seedlings to plant trees to control erosion was that seedling containers could not be obtained at an affordable price. When she came back to her community, she and other members of the women's group discussed with the traditional leaders the possibility of making seedling "baskets" from locally available resources, namely grass and the bark of the banana tree. This became the solution that allowed the group to start setting up a tree-seedling nursery.

As a group, the women make the seedling containers by weaving the grass around rope made from the banana tree bark, starting from the base of the container and working upwards to complete the walls of the container. They leave the top open for insertion of the substrate and seed. The association members collect the seeds from four local indigenous trees species. They then place the containers with the seeds in the nursery, which the women built using locally available materials: with a roof of palm straw and cereal stalks and leaves supported by stakes to provide shade. The seeds usually take about 30 days to grow into seedlings old enough for transplanting. Then the association members take the seedlings to the eroded site, where they have already prepared planting holes, and plant the seedlings without removing them from the straw containers, which also serve as fertiliser and hold moisture.

The women also use such containers to plant vegetables in their home gardens. In addition, some women in the neighbourhood have started making baskets in a similar way. They use the baskets for storing dried garden products, covering the baskets tightly with a straw lid and keeping them in a

cool place away from the attack of termites. Because the baskets allow air to circulate in the preserved produce, this can be kept for up to 12 months.

The water tank innovation

Another challenge in running the nursery was to ensure the availability of water for the seedlings. The idea of constructing water tanks came up during a session on participatory innovation development (PID) held during a tailor-made training (TMT) for Prolinnova–Mozambique partners funded by Nuffic (Netherlands Organisation for the Internationalisation of Education) in 2020. One participant mentioned a new type of water tank that had been developed by Adolfo Gove in Inhambane Province. The Tchemulane Women's Association then decided to include construction of such a tank in their PID pilot project – which was also part of the Nuffic-funded TMT programme – in order to ensure that their nursery had a good supply of water. The idea was to integrate water catchment and the operation of the tree nursery using the innovative seedling containers. The association invited the innovator to provide technical guidance in constructing the tank, paid for his transport and provided him with accommodation.

The innovator advised and guided the women in constructing a 6000-litre tank themselves. The tank is an adaption of the normal cement tank but uses less cement. It is dome shaped and thus less likely to crack than are other cylindrical cement tanks. Half of the tank is below the ground surface, making it easy to fill and also ideal for storing drinking water, as it is kept cool. The women regarded the self-made tank as preferable to the plastic tank, which must be transported into the area and needs an additional structure to keep it erect. The tank that they built needed three bags of cement, a wheelbarrow full of fine stone, some sand and enough water for mixing, all with a total cost of about 30 USD. In comparison, a plastic tank with the same capacity costs between 80 and 160 USD in addition to the cost of installation.

Advantages of the local innovations

The innovation of making seedling containers from plant materials has several advantages:

- Because the containers are light and portable, they can easily be used at household and village level for seedling and vegetable production.
- The container is buried with the seedling when it is transplanted and decomposes, thus helping to improve soil fertility and reducing the washing out of nutrients from the roots of the seedling.
- The containers are suitable for use in areas with low water availability as they conserve substrate moisture by reducing evapotranspiration.
- The biodegradable containers replace plastic and are environmentally friendly; they are very easy to produce with locally available resources at low cost.

The storage baskets have similar advantages. They are easy to make (although time consuming), easily affordable and durable. They allow air to circulate in the dried produce, thus allowing them to be stored for a long time and reducing post-harvest losses, especially of vegetables and leguminous leaves.

Continuing the process

Prolinnova–Mozambique is continuing to support the community in a process of PID to further develop the local innovations with the aim of reducing the time inputs and workload of the women. Particularly the making of the woven-grass seedling containers and baskets is very time-consuming and laborious.

Meanwhile, the women's group is already encouraging other people in the neighbourhood to gain inspiration from their initiative. After the tank was built at the tree nursery, some people came to find out if they could join the group and also how they could build similar water tanks at their own homes. Later, after having learnt how to do it and having saved enough money to buy the cement, they asked their neighbours to help construct the tanks.

The combination of innovations that the women's group developed to address problems of land degradation has created interest also among relevant government ministries and administrations, including the district advisory services, who were very impressed when they visited the community. The inauguration of the tree nursery by a dignitary at district level made the group feel recognised and honoured for their achievements. They have now invited the provincial governor to visit and witness how well the tree planting is working.

Prolinnova–Mozambique plans to create awareness, encourage and support communities to disseminate their experiences in this initiative by documenting them and sharing them with community and village leaders and Departments of Agriculture in other districts through meetings, posters, photographs, songs and theatre. The NGO that coordinates Prolinnova–Mozambique is well equipped to do this, as it is the Centre for Theatre of the Oppressed (CTO). It also plans to make use of national events such as National Forest Day to highlight to government authorities the importance of encouraging local innovation to protect and restore landscapes.

Participatory Innovation Development

Processes of Participatory Innovation Development (PID) are promoted by Prolinnova, an NGO-initiated international network that promotes local innovation in agroecology and natural resource management (NRM). PID is a process in which scientists, agricultural advisors and other development workers join local people to further develop their local ideas and initiatives to solve problems and grasp opportunities in achieving food security and sustainable NRM. PID integrates local and scientific knowledge in farmer-led joint research and development.