



Alternative fodder production for vulnerable herders in the West Bank

Increasing profitability of livestock production to strengthen resilience to drought and market volatility within protracted crises

→ **Context** Unfavourable conditions due to an arid environment, access restrictions and a protracted crisis context have contributed to the fragility of local production systems in the West Bank, where most Bedouin families rely on livestock as their main source of income. Since 2011, the Food and Agriculture Organization (FAO) of the United Nations has been promoting the use of hydroponic technology (soil-less plant propagation) by vulnerable herders and their cooperatives, providing a low-cost, high quality source of fodder that is available year-round. This approach increases the profitability of livestock production and helps herders stay in business.

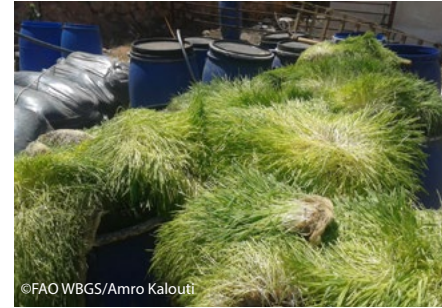
→ **Challenge** The protracted crisis, recurrent droughts and overgrazing have decreased access to grazing land for livestock, which in turn has increased their dependency on imported fodder and made livestock owners more vulnerable to fodder price volatility. As fodder is an essential expense (70 percent of costs) needed to sustain herder livelihoods, alternative sustainable fodder production activities can prevent herders from adopting negative coping mechanisms such as selling productive assets (land, animals, etc.).

→ **Methodological approach** Among an array of technologies being tested in the region, hydroponic technology can produce green fodder throughout the year. In order to receive a hydroponic unit, livestock cooperatives were requested to submit a business plan or proposal. A technical committee was established for the design development, unit fabrication and implementation of the hydroponic technology. FAO organized a technical training in Tunisia, attended by Ministry of Agriculture of the West Bank and Gaza Strip, FAO and NGO staff involved in the design of the hydroponic units. Subsequently, through Training of Trainers (ToT) activities, all the beneficiaries who received the units were trained on how to use the units. The fodder produced by the 15 livestock cooperatives has been used by all cooperatives' members.



What is hydroponic technology and how does it contribute to increasing resilient livelihoods?

Hydroponics is a subset of hydroculture and the most common soil-less method of growing plants. Plants can be grown with or without an inert substrate (e.g. sand, perlite or gravel) in an aqueous medium with bare roots. The substrate can provide plant support and moisture retention. Irrigation systems are integrated within these substrates, thereby introducing a nutrient solution to the plants' root zones. The green fodder produced from hydroponic technology contains roughly 16–18 percent protein. This intervention is designed to urgently minimize the devastating effects of external shocks and is particularly interesting in arid and semi-arid agrosystems as well as in fragile contexts where herder livelihoods strongly depend on a high quality and low-cost source of fodder.



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Key facts

Location → Across the entire West Bank in all eleven governorates.

Multistakeholders → A technical committee was set up involving FAO, the Ministry of Agriculture of the West Bank and Gaza Strip and local NGO partners.

Donor → The Government of Canada.

Target Group → 15 livestock cooperatives were selected with roughly 50 members each, totaling 750 beneficiary herders. These are low resilience herders who rely completely or partially on livestock production for their own food security and livelihoods.

→ **Impacts** As currently 90 percent of feed and fodder is imported from outside the West Bank, the potential economic benefits of utilizing locally produced fodder are clear. Overall, a herder saved approximately 30 percent of the usual cost of feed by using fresh, green barley fodder produced through the hydroponic unit, as well as benefitting from the green fodder's high nutritive value. Many of the livestock cooperatives include female members, allowing these most vulnerable herders and their households to also benefit from hydroponic fodder.

The hydroponic method leads to a decrease in the cost of feeding by approximately 30 percent, which allows herders to save capital, and reallocate resources for other expenditures.

→ **Sustainability** Although a detailed evaluation of the project's sustainability is required, the hydroponic promising method can be considered economically, socially and environmentally sustainable in the context of the West Bank: it increases herders' income, benefiting both male and female herders. In addition, the fodder is grown without land, soil, fertilizers or pesticides – the only resources needed are water, seeds and electricity. The institutional sustainability depends upon the livestock cooperatives: all 15 of them were actively engaged at the outset of the project, and remain so today.

Each hydroponic unit produces around 200-250 kg of fresh green barley per day on full capacity, which, mixed with dry concentrate supplements, is sufficient to feed 400 sheep.

→ **Replicability** Building upon the experience of this project, the potential for replicability of this promising practice has been demonstrated, based on the availability of resources (space, water, quality seeds, etc.). Some key considerations to be taken into account before replication or up-scaling are:

- Market constraints for local availability of seeds, provided that the other inputs used (water and electricity run the production units) are available.
- Local climate conditions: according to these conditions, changes to the existing design of the hydroponic unit may be needed.

Livestock cooperatives are key partners for the replication of this practice, and thus their creation and membership need to be supported

To successfully replicate this practice on a larger scale, the existing livestock cooperatives would need to be enlarged, either in membership or in the creation of new cooperatives to meet the increased demand.

TESTIMONIAL

Mr. Saaed Bisharat is the head of the Cooperative Association from the village 'Atuf in Tubas Governorate. He describes his experience of the hydroponic fodder production unit:

"It is clear that the herders in my cooperative benefit economically from the unit. We noted an increase in the milk production of our dairy cattle by up to 33 percent, compared to the amount the cows produced when fed the traditional feed. It is well known to herders that sheep which are fed fresh feed (from grazing) are healthier. Their wool is shinier and in general their health is better. Now, with this hydroponic unit, fresh, green fodder can be available all year, and not just during the grazing season".



→ More information

On this practice and hydroponic technology:

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Full good practice fact sheet: www.fao.org/3/a-i4759e.pdf

Detailed methodology: <http://teca.fao.org/read/8636>

On resilience good practices:

- KORE@fao.org
- www.fao.org/in-action/kore/good-practices/en/

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