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Planning and piloting watershed rehabilitation for improved water productivity with water harvesting *in Jordan*

Objective

Enhancing agricultural water productivity through ensuring agroecosystems resilience, health and diversity; to achieve long-term sustainability for the environment and livelihood of the local community.

Background

- Extremely scarce water resources in Jordan and the limited rainfall and water influxes combined with increased water demand from various sectors determine the agricultural production systems; however, climate change may eventually lead to more frequent and severe floods, erosion, and erosion droughts. Whilst the extreme events are largely threatening, agricultural adaptation technologies that can tackle those challenges and even benefit from the erratic (surface) water occurrence exist – a prominent example is Water Harvesting (WH). The technology concentrates and stores excess rainwater in defined locations for targeted utilization over time. While WH retains only a (small) fraction of the available surface water - important for, e.g. boosting the ecosystem's recovery and/or local agriculture – it can also aim to decelerate runoff and control erosion.
- A community-inclusive design for rehabilitation and sustainable management options was conducted within the Sharhabeel Bin Hasna district. In addition, the activities enhance and support the local community options toward livelihood improvements.

Methodology

- A sustainable management plan was developed for agro-silvo-pastoral watershed rehabilitation with the local community and stakeholders. Involves socio-ecological site characterization, community needs assessment, and rapid watershed (hydrology) diagnostics.
- Identified the potential effects of agro-silvo-pastoral rehabilitation and sustainable watershed management to promote the effectiveness of community-based interventions to adapt to dry conditions, extreme events, and climate change. Involving establishing of around 1 ha agro-silvo-pastoral rehabilitation test site, ex-ante assessment of multiple sub-catchment-scale rehabilitation and management scenarios considering water and sediment dynamics.
- Capacity development enhances agro-silvo-pastoral farmers' resilience through community and household dairy and food processing.



Results

- A sub-watershed is defined and selected with an area of (2104 ha) of which 76 percent is restorable.
- The hotspot erosion map reveals that 25 percent of the area is at low risk of erosion, 53 percent is prone to medium erosion, and 22 percent is highly erodible. The curve number CN assessment showed an average annual runoff of 84.6 mm and a runoff ratio of 18.9 percent.
- Two focus group discussions were conducted at 'Alkamael Cooperative' in Tabaqet Fahel and the 'Sustainable Agriculture Cooperative' in Sharhabeel Bin Hasna.
- Rehabilitation of degraded site around 1 ha using micro-water harvesting and planting native rangeland species of *Atriplex halimus* and *Salsola vermiculata* (concluded on February 2022). The seedling survival rate is 86 percent (conducted September 2022).
- Capacity-building and awareness-raising sessions were conducted on key rehabilitation-relevant aspects.
- Approach and a survey tool, questionnaire, and methodology framework developed and used to assess communities' perception of rehabilitation programs and ecosystem services.
- Develop a list of native tree and shrub species for future rehabilitation efforts.
- Training and capacity development sessions were followed with a dairy production unit establishment in the target community, including a milk fat separator and cheese pres, in the target community.
- Training and capacity development sessions for food processing and drying complemented the establishment of 3 solar driers in the target community.

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▪ Around 16 training and capacity development conducted for the target community. The total number of participants was 508, of which 40 percent were women.



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