WOCAT
World Overview of Conservation Approaches and Technologies

United Nations Convention to Combat Desertification | United for land

WATER AND IRRIGATION

Gender and Sustainable Land Management (SLM)

Gender equality is a key entry-point for SLM adoption, spread and upscaling. The joint WOCAT-UNCCD project on gender-responsive SLM technologies and approaches was launched in 2020 to fill the gap in the availability of gender-disaggregated data. The project deepens the analysis of SLM practice adoption patterns, assesses and analyses their differentiated impacts on women and men and informs gender-responsive policy design aimed at achieving land degradation neutrality.

Methods and data

A gender questionnaire (QG) was developed and reviewed by 20 gender and SLM experts and piloted in 15 countries to test the methodology, the applicability of the tool and the relevance and use of the data collected. Five technology group profiles for gender-responsive SLM technologies and approaches were elaborated based on the WOCAT global SLM database and piloting data. The data under this profile cover 4 Technologies and QGs. Hence, the data is not comprehensive and there are gaps in terms of practices and regions. Two exemplary technologies are attached to each profile.

Making optimal use of water: protecting and harnessing water resources

"More crop per drop" is a guiding principle in dry zones. How can it be achieved? There is a long list: it includes more efficient water collection and abstraction, water storage, water distribution and water application. To guard water resources, the protection and sustainable, hygienic, use of catchments is essential. Close to rivers, maintaining the health of biodiverse and protective riparian forests is paramount. Water harvesting is the collection and concentration of rainfall runoff for better crop growth, for domestic/livestock supplies, or for aquifer recharge. Efficient use of water is important throughout: from abstraction to application. Micro-irrigation technologies (for example drip-irrigation) for small-scale farming, if applied properly, increase water use efficiency significantly.

Rainwater harvesting optimises the productivity of limited water resources. It also reduces risk of production failure by minimizing the effects of drought and dry spells. Furthermore, it enhances agricultural production, improves water use efficiency, increases access to water, reduces off-site damage and improves surface and groundwater recharge. Rainwater harvesting is also "fertility harvesting" because collecting runoff means capturing sediment and surface organic matter carried in the flow.Technologies that are included under this group include floodwater harvesting; macro-catchments such as large semi-circular bunds; road runoff collection; gully plugging; ponds and dams; recharge wells; micro-catchments including pits and basins; rooftop and courtyard water harvesting; micro-irrigation; and (at a larger scale) spate irrigation.

These technologies are suitable for semi-arid and sub-humid areas with common seasonal droughts, and on highly degraded soils.

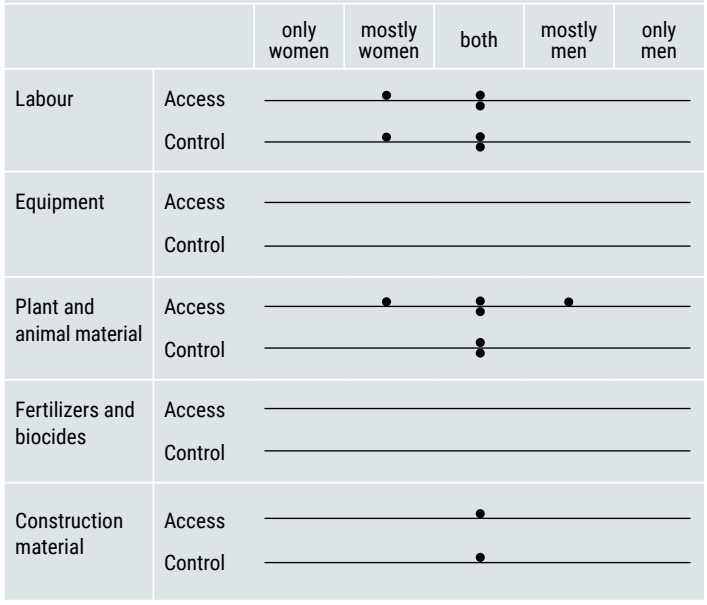
Policy recommendations

- To increase an irrigation or water infrastructure technology's relevance and appeal, involve women and men equally in design and allocation of steps in implementation.
- Adapt the technology and provide women-friendly tools and equipment to reduce physical workload: modern irrigation technology provides opportunities for this, for example drip irrigation from solar powered pumps.
- Provide financial support for women and marginalized groups to invest in water development and irrigation due to high initial costs: small market gardens for vegetables are a case in point.
- Strengthen awareness about appropriate sharing of work – tasks that need special skills or strength – in supporting the development of productive irrigation schemes or water infrastructure to increase family well-being.
- Ensure equal participation of men and women in technology design (e.g. selection of seedlings, which varieties to grow, when to plant) and encourage discussion of a mutually beneficial division of tasks.
- Build women's entrepreneurial skills and financial literacy to ensure that the benefits from the technology are enjoyed and controlled for their, and the whole family's benefit.

Technology-related aspects

Access and control to main inputs

Each dot represents a case study



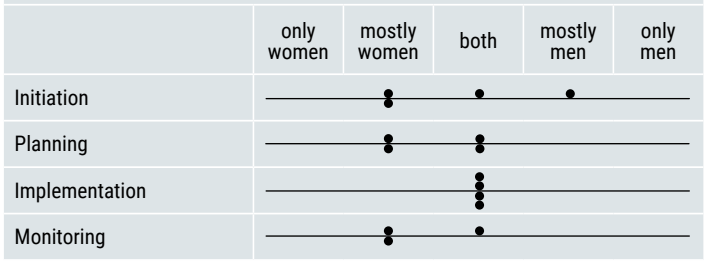
Access: Right to use resources **Control:** Power to decide on the use of resources

Gender-related impact of Technology implementation

Each dot represents a case study

Involvement and participation

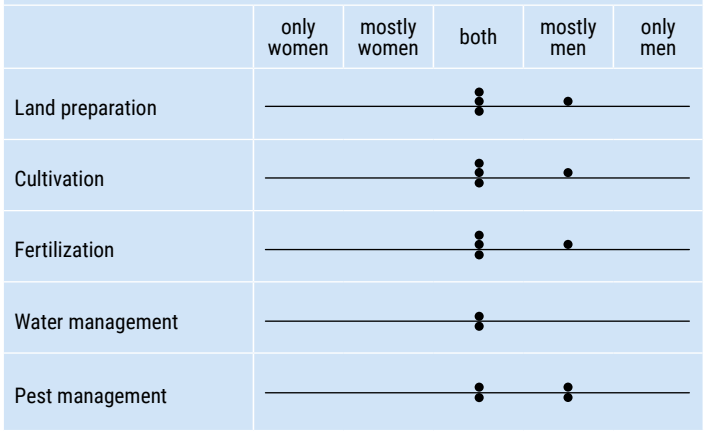
Each dot represents a case study



Community-related aspects

Gender roles in land management

Each dot represents a case study



Ownership and tenure rights

	Women number of case studies	Men number of case studies
Access to land	**3 inherited**	**4 inherited**
Quality of land	**4 marginal land** 1 fertile land	**7 marginal land** **6 fertile land**
Tenure rights	**2 open access** **2 individual** (not titled)	**2 open access** **2 individual** (not titled)
Perceived land right security	1 low **1 medium** 0 strong	0 low **2 medium** 0 strong
Ownership of livestock	**3 small ruminants**	1 small ruminants **3 large ruminants**

Land use rights

Type	Gender-specific number of case studies	Not gender-specific number of case studies
Statutory	0	**3**
Customary	**2**	0
Inheritance	**3**	2

The water collection pond has helped farmers to irrigate their rain-fed land during dry months which has increased the crop production; Photo: Shishila Baniya

Soil-cement water collection pond for supplemental irrigation [Nepal]

Description

A soil-cement water collection pond stores rainwater, runoff and household kitchen wastewater – free from soap and detergent – for supplemental irrigation during the dry season.

In Nepal's mid-hills, farmers face problems during the dry season to irrigate their fields, as they entirely depend on rainwater. Soil-cement water collection ponds are ideal to tackle this challenge, as they can capture excess rainfall during monsoon, which is later available during prolonged periods of seasonal water shortages.

The Resilient Mountain Village (RMV) project of ICIMOD together with its local partner, CEAPRED, tested and demonstrated soil-cement ponds with a capacity of 24,000 liters. These conservation ponds were used for irrigating high value off-season horticultural crops (vegetables, fruits, and spices). The crops were irrigated with drip irrigation and micro-sprinklers. The ponds were fed from rainwater, upland springs and taps, and household wastewater from kitchens, free from soap and detergent. They were established during the dry season over a three-month period. They were prepared by selecting a suitable site with a sufficient catchment; mapping out the area and depth of the pond; digging out the soil; removing protruding stones and roots; compacting and smoothing the sides and bottom of the pond; and plastering the floor and walls. For safety, each pond was enclosed with a wire/ bamboo fence (or any locally available material).

This technology has helped small-scale farmers to irrigate their rainfed land during dry months, and it has increased crop production and their incomes. Land users particularly liked the fact that their production improved and that they were able to grow up to three crops per year. Through this, farmers were able to diversify their crops, and they were less vulnerable to the impact of the dry season.

Women-friendliness of SLM Technology

The soil-cement tank technology is easily applied by both men and women. They are both actively involved from planning to implementation. Both helped in construction of the tank. They even mentioned that this has been very useful in reducing women's drudgery. So, they are now planning to implement this technology for every household of the community.

Location:
Namobuddha, Kavrepalanchowk, Nepal

Land use:
Cropland – Annual cropping

Types of degradation adressed:
Water degradation

Main purpose(s) of the technology:
- improve production
- Improve water availability during dry seasons

References

Compiler of Gender Questionnaire:
Kabita Nhemhafuki and Shishila Baniya

Date: December 2021

Key informant(s):
Ram Deo Shah, CEAPRED and Jamuna Adhikari Naranyan Sthan Krishak San and Laxmi Gautam, land user

Visit in WOCAT database:
qcat.wocat.net/en/summary/5684

Meeting with land user group in Namobuddha to collect gender-disaggregated data; Photo: Shishila Baniya

Soil-cement water collection pond of 4m length, 2m width and 1.5m depth; Photo: Jitendra Bajracharya

Main establishment and maintenance activities

Activity	Labour by family	Reason	Labour
Selection and preparation of land	Both		Hired: both Exchange*: yes
Excavation and plastering	Mostly men	Heavy workload	Hired: mostly men Exchange*: yes
Fencing	Mostly men	Experience	Hired: mostly men Exchange*: yes
Removing sediment (once a year)	Both		Hired: both Exchange*: none

* Labour exchange within community

Cultural customs and taboos

Due to the patriarchal system in the community, more weightage is given to men in comparison to women. Men are perceived as major providers of a family while women are perceived as playing only a supportive role in the family, carrying for children and household. Some of the people in the community feel that it is an unnecessary financial burden to send a girl child to school as she will be married off and sent to another family.

Land tenure

In the community, land use rights are based on customary practices as the Hindu system of beliefs emphasizes the retention of family property within the male ancestral line which influence gender-differentiated land rights.

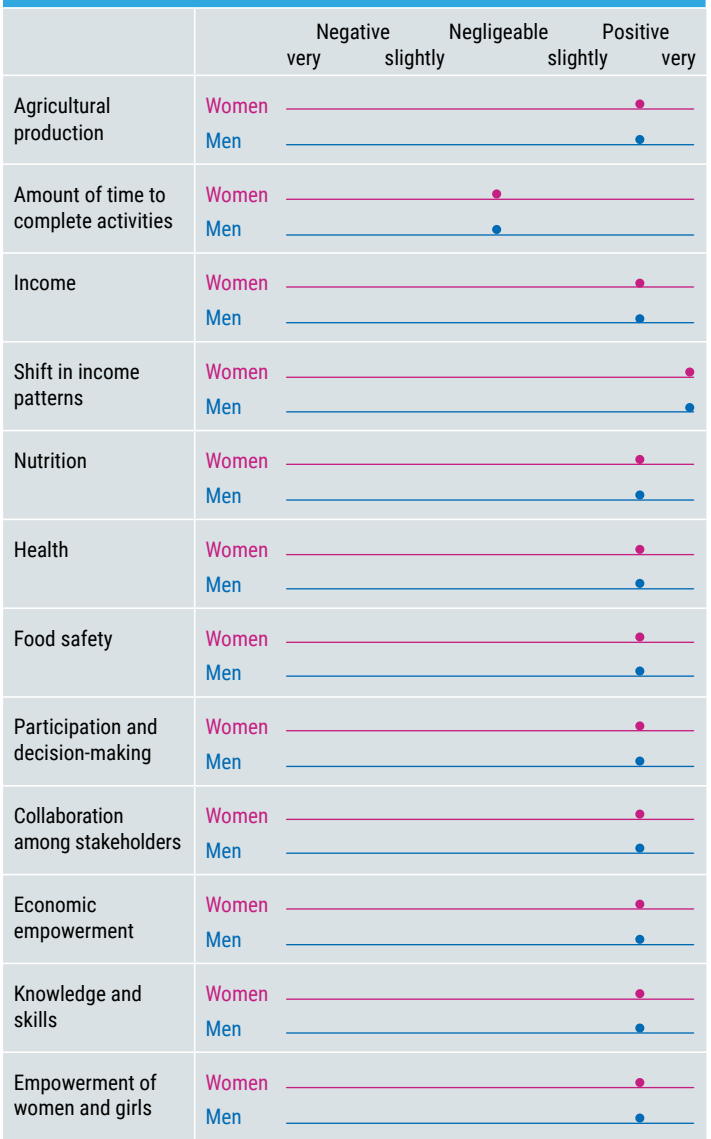
Although, Article 20 of the Constitution states that son and daughters have equal rights to ancestral property, customarily, property is generally passed from father to son. This shows that women's access to land tenure and ownership is very limited.

Recommendations to improve gender-responsiveness of the Technology?

The gender-equal uptake of this technology can be improved by providing subsidies to women and marginalized groups as the initial cost for construction is high. Furthermore, providing women-friendly tools for tank construction is necessary.

Gender-related impact of Technology implementation

Each dot represents a case study



Raised garden beds consist of an interior of ligneous material, covered by a layer of earth; Photo: Karl Harald Bier

Terra Preta raised garden beds [Haiti]

Description

Terra Preta raised garden beds comprise a combination of techniques derived from permaculture, and the production and use of "Terra Preta", an anthrosol. These garden beds, created with local resources, are highly fertile and enable the achievement of much higher yields than traditional techniques, while diminishing soil erosion.

Terra Preta is a technique to create soils based on lacto-acidic fermentation of organic matter with charcoal powder. The technique is characterised by the use of local resources to achieve high fertility. Through this method, a soil layer of several decimeters can be produced in a few years, in contrast to a natural rate of around 100 years per centimeter.

Raised garden beds (or "Hugelculture") are a technique derived from permaculture. They consist of an interior of ligneous material, which is covered by a layer of earth. The elevated construction facilitates work in the garden, and the decomposition of wood inside the beds. Due to their spongy structure, the raised garden beds function as a water reservoir during dry periods.

The garden beds are placed perpendicularly to the slope direction as far as is possible, and are arranged alternately (in a "staggered" layout), with a diversion to direct the surface runoff towards the structures.

The following inputs to the garden beds can be found locally: organic matter (ligneous material, dry straw, fresh straw, harvest residues, organic residues), charcoal powder (biochar), and ashes or other fertile materials.

The technique is valued because of its cost-effectiveness and its sustainability compared to known techniques.

Women-friendliness of SLM Technology

This technology is women-friendly. However, a combined effort at the household level is needed for operations to proceed successfully.

Location:
Municipality of Léogâne, Haiti

Land use:
Cropland – Annual cropping

Types of degradation adressed:
chemical soil deterioration
biological degradation

Main purpose(s) of the technology:
- reduce, prevent, restore land degradation
- mitigate climate change and its impacts
- create beneficial economic impact

References

Compiler of Gender Questionnaire:
John Saint Joy and Wislerson Pierre Louis, Croix-Rouge Suisse

Date: March 2022

Key informant(s):
Exode Sanon, APMKL and Pierre Fracis Joseph, VICODEL

Visit in WOCAT database:
qcat.wocat.net/en/summary/4635
qcat.wocat.net/en/summary/1954

Meeting with land users applying Terra Preta to discuss gender-related issues and collect gender-disaggregated data; Photo: Wislerson Pierre Louis

Water flow around Terra Preta raised garden beds, limiting erosion and facilitating infiltration of water; Photo: Karl Harald Bier

Main establishment and maintenance activities

Activity	Labour by family	Reasons	Labour
Clearing the area	Only men	Heavy workload	Hired: none Exchange*: none
Ploughing and harrowing	Only men	Heavy workload	Hired: none Exchange*: none
Fertilization	Both		Hired: none Exchange*: none
Transplanting and watering	Both		Hired: none Exchange*: none
Harvesting	Both		Hired: none Exchange*: none

* Labour exchange within community

Cultural customs and taboos

Culturally, women do not pick up the pickaxes to do the digging.

The communities believe strongly in the moon for planting.

Land tenure

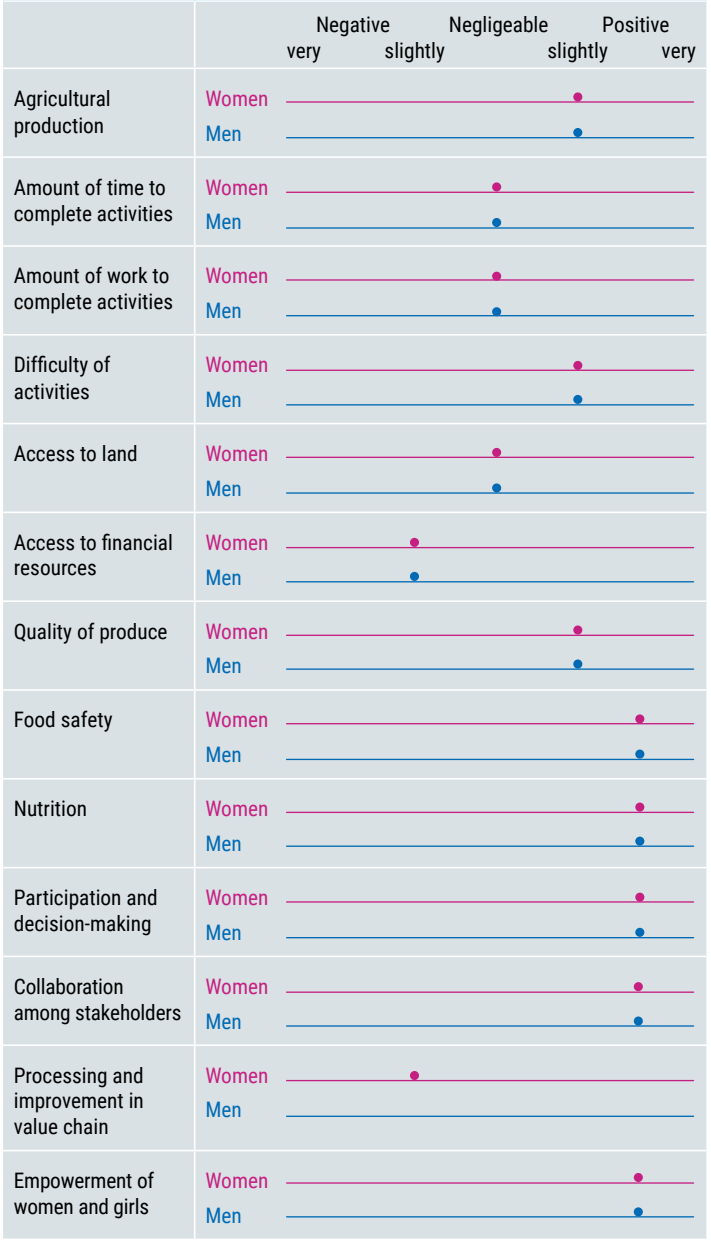
Women and men inherit equally.

The ownership of land depends on the family of the man or the woman. If the woman's relative has a lot of land, the woman will also have land. It is the same for men.

Recommendations to improve gender-responsiveness of the Technology?

The following recommendations would increase the women-friendliness of the technology but at the same time reduce its efficiency:

- Adapt the technology in a way to avoid digging
- Establish the structure in an elevated position
- Reduce the amount of material to be put in the structures

Gender-related impact of Technology implementation

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