

GENDER-RESPONSIVE SUSTAINABLE LAND MANAGEMENT

Key messages

Women in developing regions affected by desertification, land degradation and drought produce 60–80 per cent of the food grown. Their role in sustainable land management is thus crucial.

Gender is important in SLM adoption and upscaling. Men and women differ in their adoption preferences and patterns.

Increasing awareness is required about women's roles both in food production and land management.

Technologies are not gender-neutral: there is gender-response to policies, institutions and customs.

Gender-blind technology design and dissemination reduces the potential impact for adoption – and may even reinforce existing prejudices and inequalities.

Gender-related issues in SLM should always be assessed in context-specific, as well as general ways, and acted upon accordingly.

Women's visibility needs to be raised and their voices heard more loudly to strengthen their access to productive resources, information and training.

Women's capacity to exercise their legal rights to land and resources on equal terms with men is influenced by customary, religious or traditional laws and practices.

Legal awareness and access to land, its resources, and security of tenure for women are key to gender-equal upscaling of SLM practices.

Equal access to productive and financial resources must be addressed to increase women's decision-making capacity, and consequently their uptake of SLM.

Access to information and extension services must be tailored to gender- and context-specific needs (e.g. literacy level, workload, timing of activities).

Technology Group Profiles



Soil and Vegetation – Nurturing the soil: keeping it fertile and maintaining green cover on the surface

«Discussing gender-related issues raised awareness on its importance in land management as well as household income generation and farming practices»

Svaymeanchey Satrej Samaki Agricultural Cooperative, Cambodia



Agroforestry and Homegardens – Mixed production systems in the farm and at home: looking after land and families

«Women and men debated on how to guarantee equal opportunities in decision making, participation, and equal and fair distribution of benefits»

Pambadeniya Women Group, Sri Lanka



Water and Irrigation – Making optimal use of water: protecting and harnessing water resources

«Empower women in decision-making and participation in all steps of the rice production»

land user from Sayeng village, Lao PDR



Feed and Fodder for Livestock – Improving animal nutrition: managing rangeland, pastures and crop-livestock systems

«Improved access to time, finance, knowledge and skills can promote the Technology for both men and women»

land user from Nyamiyaga Zero grazing farmers group, Uganda



Natural and Semi-Natural Forests – Trees: providing hotspots of biodiversity and carbon capture for people and nature

«It is relevant to everyone, women and men, to know and understand their tenure rights in order to improve gender equality and sustainable land management»

land user from Los Chochos, Colombia



SOIL AND VEGETATION

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 6 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.

Nurturing the soil: keeping it fertile and maintaining green cover on the surface

Enhanced soil fertility management and improved ground cover go hand-in-hand. The key strategy is to combine various methods of promoting fertility while conserving soil, water and vegetation. This leads to multiple benefits: soil organic matter content is increased, soil structure improved, soil nutrient content raised, water infiltration is eased – and there are positive influences on above and below-ground biodiversity.

Healthy soils deliver simultaneous socio-economic and environmental benefits. Thus, yields are increased, but also stabilized. Diversified production practices – which are part of the strategy – lead to better and more reliable livelihoods. At the same time, soil erosion is reduced, and chemical and physical soil deterioration can be reversed. Off-site and downstream damage is controlled. Healthy and fertile land supports more resilient, drought-tolerant systems for the direct benefit of people, and protects biodiversity for the overall good of the environment.

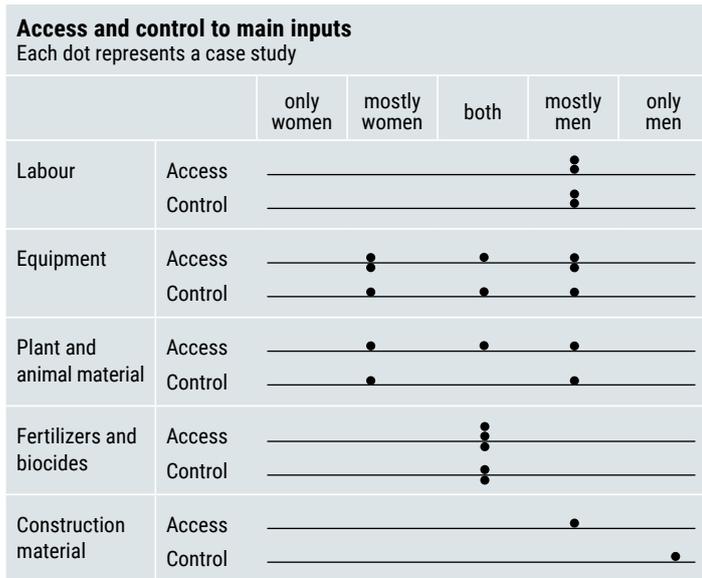
Technologies that are included under this group are numerous. They include manure and compost making and application; “green manuring”; crop rotations that include leguminous nitrogen-fixing plants; micro-placement of inorganic fertilizer; addition of biochar as a soil amendment; mulching with organic residues; and cross-slope barriers of vegetative strips or stone/earth bunds. It may also entail entire systems, such as organic agriculture, or alternatively “conservation agriculture”, which combines minimal soil disturbance, mulching and crop rotation.

There are technologies here that can be employed under the full range of agro-ecological zones and farming systems.

Policy recommendations

- Raise awareness of the gender-specific aspects and gender-related challenges of land management – in-field decision-making as well as field operations of tillage, manuring and harvesting – all of which influence household income generation from farming.
- Build awareness amongst men and women about addressing structural barriers, customary laws, beliefs and cultural norms that limit women’s mobility and their access to labour, land, financing and training – in relation to productive land use.
- Provide gender-specific incentives through facilitating access to finance, and support investment – thus strengthen women’s decision-making power over farmland.
- Increase information and extension services equally for women and men: tailor messages that address both genders.
- Promote learning and knowledge sharing experiences through exchange or site visit events for men and women equally – and ensure “host farmers” are women and men in proportion.
- Where women are isolated, encourage working in cooperatives or informal groups to trigger their ability to profit from soil and vegetative resources.

Technology-related aspects

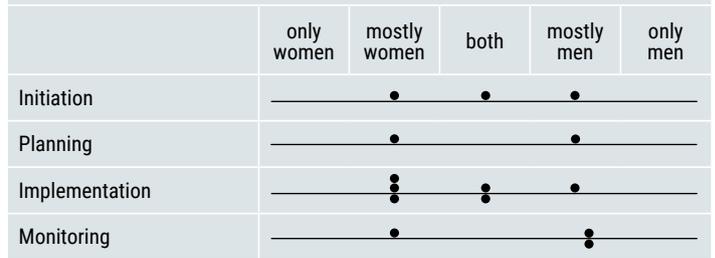


Access: Right to use resources **Control:** Power to decide on the use of resources



Involvement and participation

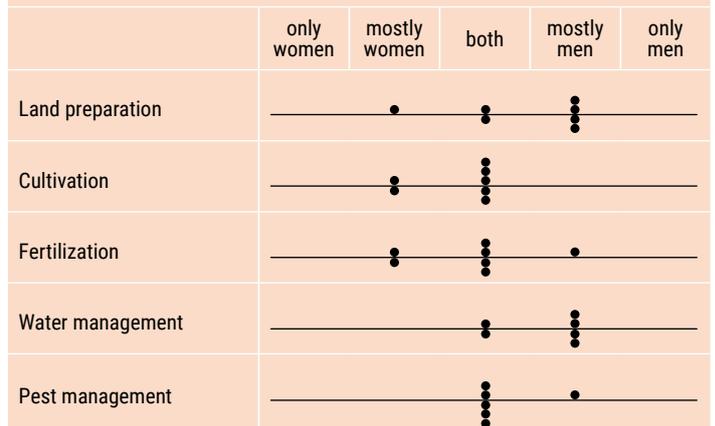
Each dot represents a case study



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	5 inherited 3 bought	5 inherited 3 bought
Quality of land	4 marginal land 4 fertile land	4 marginal land 3 fertile land
Tenure rights	2 open access 2 communal 3 individual (not titled) 2 leased	2 open access 2 communal 3 individual (not titled) 2 leased
Perceived land right security	1 low 4 medium 2 strong	1 low 4 medium 2 strong
Ownership of livestock	Mainly small ruminants	Large and small ruminants

Land use rights

Type	Gender-specific number of case studies	Not gender-specific number of case studies
Statutory		5
Customary	3	3
Inheritance	1	5

Literature

Dick Frederiksen, S.; Elias, M., Zaremba, H.; Aynekulu, E. (2021). Developing gender-equitable ecological restoration initiatives: A synthesis of guidance to improve restoration practice. Rome (Italy): The Alliance of Bioversity International and CIAT. 58 p.

Mwambi, M., Bijman, J., & Galiè, A. (2021). The effect of membership in producer organizations on women's empowerment: Evidence from Kenya. Women's Studies International Forum.



Intercropping can assist farmers in increasing yields and reduce crop damage by insects, whilst maintaining and improving soil fertility; Photo: Sophea Tim

Crop rotation to promote safe vegetables [Cambodia]

Description

Crop rotation is a component of integrated pest management (IPM), which can contribute to improvement in crop production and reduces use of chemical fertilizers and pesticides.

Crop rotation is the process of regularly alternating crops on a seasonal basis on the same plot of land. One of the benefits is that nutrients, especially nitrogen, are transferred to the soil as organic matter is incorporated when “green manure” crops are alternated with cereals. If these alternating crops are legumes, they also add nitrogen from the atmosphere. Rotation helps to reduce the infestation of diseases and insects that often occur when monocropping is carried out over a prolonged period. Crop rotation can improve the soil’s structure and fertility: furthermore nutrients are absorbed from different layers of the soil as the various plants’ root systems are able to penetrate the soil to different depths. Even though Cambodia has laws regarding the application of agricultural pesticides and fertilizers, there are some farmers who still use them incorrectly. In this case of rotation, long beans, luffa, winter melons, pumpkins and cucumbers are rotated on the plot.

The farmer stated that before practicing crop rotation, she mostly grew one or two crops which could be sold at a high price throughout the year. Therefore, in order to maintain her yields and prevent the crops from being damaged by insects, she had to use a lot of chemical fertilizers and pesticides. However, these only remained effective for a relatively short period and also increased her overheads. Now, rotation improves the soil quality, mitigates pests and diseases, reduces costs, improves income and also protects the health of producers and users.



Location:

Kyang Tboung village, Kampong Chhnang province, Cambodia

Land use:

Cropland – Annual cropping

Types of degradation addressed:

Chemical and physical soil degradation
biological degradation

Main purpose(s) of the technology:

- reduce, prevent, restore land degradation
- create beneficial economic impact

References

Compiler of Gender Questionnaire:

Sophea Tim and Sotheara Sun, Royal University of Agriculture

Date: February 2022

Key informant(s):

Phally Hoem and Chanthou Aek, Inspector committee of AC

Visit in WOCAT database:

qcat.wocat.net/en/summary/4486
qcat.wocat.net/en/summary/3216

Women-friendliness of SLM Technology

The application of this technology is mostly done by women as it does not require heavy work, but men also provide support with the tasks. In general women’s input is greater than men’s under this technology.



Meeting with Svaymeanchey Satre Samaki Agricultural Cooperative to collect gender-disaggregated data; Photo: Sophea Tim



Long bean in rotation after cucumber; Photo: Sok Pheak

Main establishment and maintenance activities			
Activity	Labour by family	Reason	Labour
Land preparation	Both	Heavy workload	Hired: both Exchange*: none
Transplanting the seedlings	Both	Cultural Customs and taboos	Hired: both Exchange*: none
Watering	Both	Cultural Customs and taboos	Hired: mostly women Exchange*: none
Weeding and fertilization	Only women	Cultural Customs and taboos	Hired: none Exchange*: none
Trellising	Mostly men	Heavy workload	Hired: only men Exchange*: none
Pruning	Both	Cultural Customs and taboos	Hired: none Exchange*: none

* Labour exchange within community

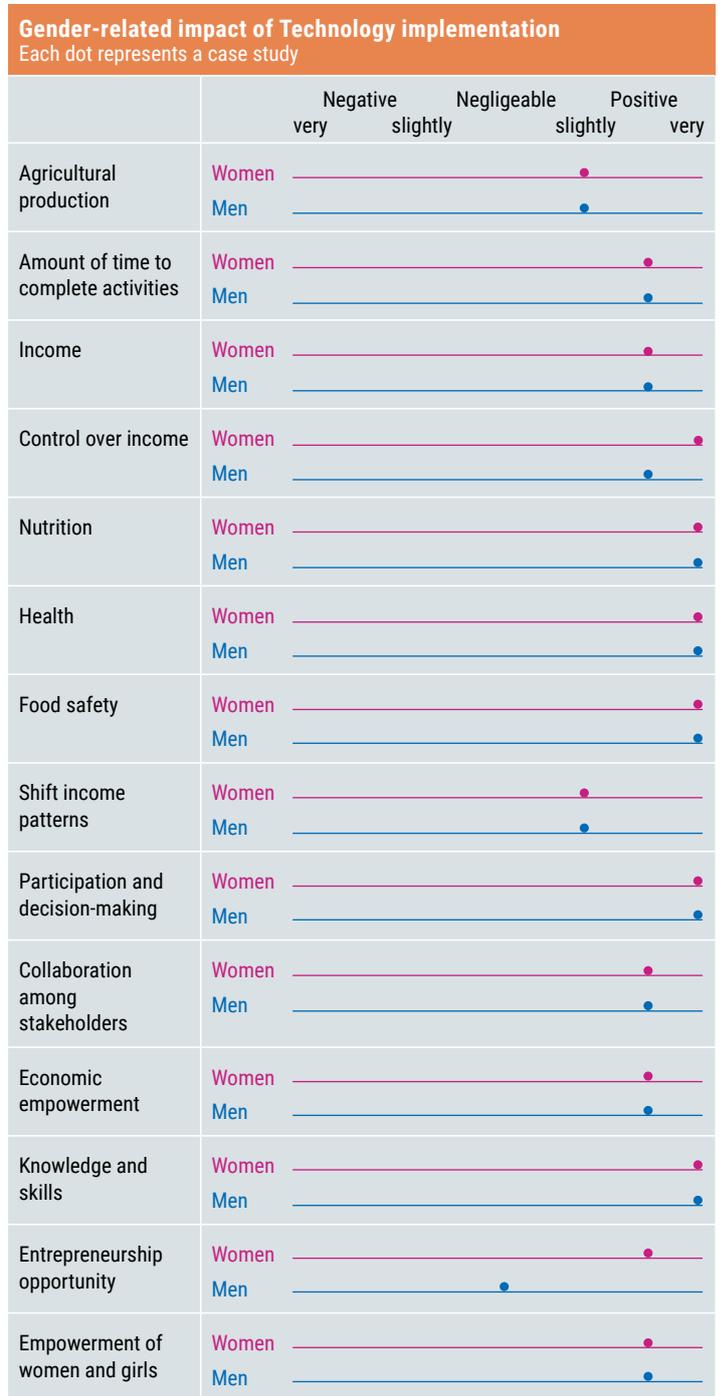
Cultural customs and taboos
Nothing special from ordinary Khmer/Cambodia.

Land tenure

- Men and women inherit equally.
- Statutory and customary land use rights are not gender-specific
- Customary rights do not prevail over statutory rights.

Recommendations to improve gender-responsiveness of the Technology?

This technology is applied by more women than men. Men should be encouraged to participate in learning sessions to see the benefits of practicing this technology for income generation. This is most likely to result in wider spread of the technology.





Compact farming for vegetable production: cooperative members jointly produce high value crops; Photo: Djolly Dinamling

Compact farming for vegetable production [Philippines]

Description

Land users are organized under cooperatives to jointly produce organic, high value crops. Through this practice, marketability and available markets for the produced commodities are increased.

"Compact farming" was set up to enhance group interaction and leadership among members of an association. The aim of the land users in growing organic vegetables is to revive and sustain soil fertility and improve waste management. Marigolds are also planted between plots within the farm to prevent and control insect and pest infestation. Land users in the barangay were empowered through farming and conservation of the forest area.

This arrangement started in 2011 with 18 farmers investing 1000 pesos (US\$ 22) each to buy initial inputs of land, seeds and fertilizer. The area was cleared for agricultural activities. Production involves high value crops such as tomatoes, lettuces, pechay, cabbages, carrots, beans, broccoli, cucumbers, and radishes. These are sold not only in Jaro but also in neighbouring municipalities and big markets in Leyte. The barangay was dubbed as the "Vegetable Basket" and the "Watermelon Queen" because of their production. Activities in the farm such as ploughing, harrowing, establishment of plots, fertilizer application, transplanting, watering, spraying and harvesting are carried out on a reciprocating basis among members of the association. Most of the farmers cultivate a single parcel, with sizes ranging from 1000-2000 square meters. Land ownership and land use rights are communal. Farm production is managed by the cooperative, which is composed of small-scale land users. Members of the association are engaged in off-farm activities such as hunting and hired labor for additional income.

Women-friendliness of SLM Technology

The technology is easily applied by both women and men.



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Location:

Jaro, Leyte, Barangay Villaconzoilo, Philippines

Land use:

Cropland – Annual cropping

Types of degradation addressed:

chemical soil deterioration
biological degradation

Main purpose(s) of the technology: –

References

Compiler of Gender Questionnaire:

Djolly Ma. Dinamling, Filipina Ventiga and Jemar Raquid from Bureau of Soils and Water Management

Date: February 2022

Key informant(s):

Alex Aborita, Leyte Compact Farming Agriculture Cooperative

Visit in WOCAT database:

qcat.wocat.net/en/summary/5067



Meeting with Leyte Compact Farming Agriculture Cooperative to discuss gender-related issues and collect gender-disaggregated data; Photo: Djolly Dinamling



Compact farming for vegetable production: cooperative members jointly produce high value crops; Photo: Djolly Dinamling

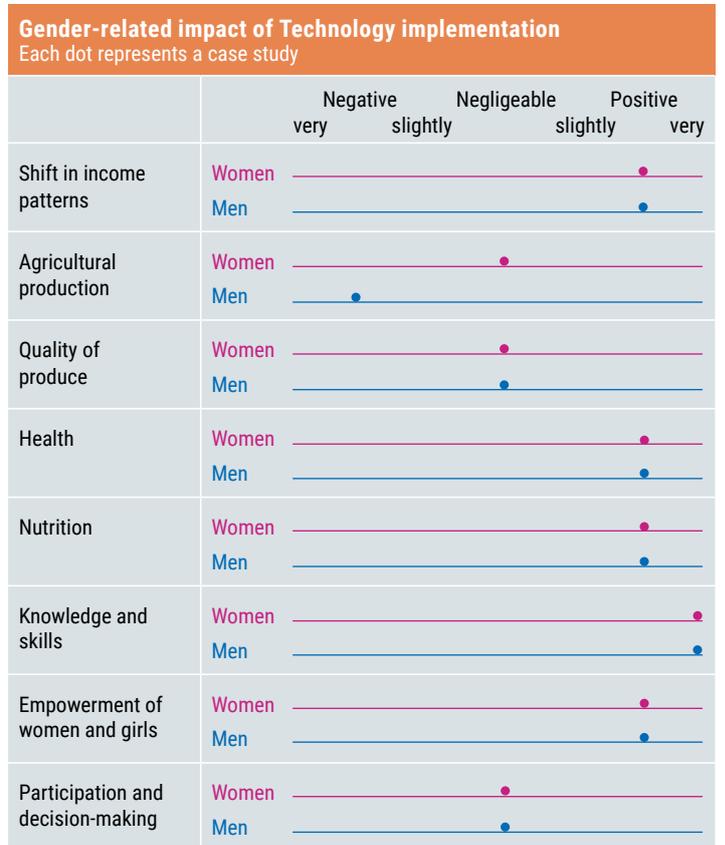
Main establishment and maintenance activities			
Activity	Labour by family	Reasons	Labour
Clearing the area	Only men	Heavy workload	Hired: none Exchange*: none
Ploughing and harrowing	Only men	Heavy workload	Hired: none Exchange*: none
Fertilization	Both		Hired: none Exchange*: none
Transplanting and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

* Labour exchange within community

Cultural customs and taboos
-

Land tenure
The land tilled by the Leyte Compact Farming Agriculture Cooperative is a Certificate of Land Ownership Award (CLOA) awarded by the Department of Agrarian Reform (DAR). This is a certificate under land reform for the agrarian reform beneficiary (ARB). Lands awarded shall be paid for by the Beneficiaries to the Landbank of the Philippines (LBP) in thirty (30) annual amortizations at six percent (6%) interest per annum.

Recommendations to improve gender-responsiveness of the Technology?
Men and women devote the same time for the farm activities. Farm activities that require a lot of physical strength are only done by men. Women in the cooperatives accepted that there are limitations in terms of the physical farm activities that they could perform. It also a form of respect that men carries the burden.





AGROFORESTRY AND HOMEGARDENS

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Mixed production systems in the farm and at home: looking after land and families

Agroforestry can be simply called “trees in productive systems”. More technical speaking, it is a collective name for land use systems where woody perennials are integrated with crops and/ or livestock for a variety of benefits and services. Integration can be either through a spatial mixture or in a temporal sequence. Agroforestry may help create micro-climates and buffer weather extremes. Homegardens are a specific form of agroforestry, comprising trees, perennial and annual crops in a series of “storeys” around the homestead.

These systems diversify food and income sources, improve land productivity and counter land degradation by providing (at least some) perennial cover. Soil organic matter content, fertility and biological activity are improved, and so is hydrological function of the land. Under homegardens, production is mainly for home consumption but surplus may be sold. Homegardens provide opportunities for women, children, the elderly and the disabled, to work productively close to home. They can protect against extreme climatic conditions and provide a resilient system that makes use of abundant fertility, water and labour close to the home.

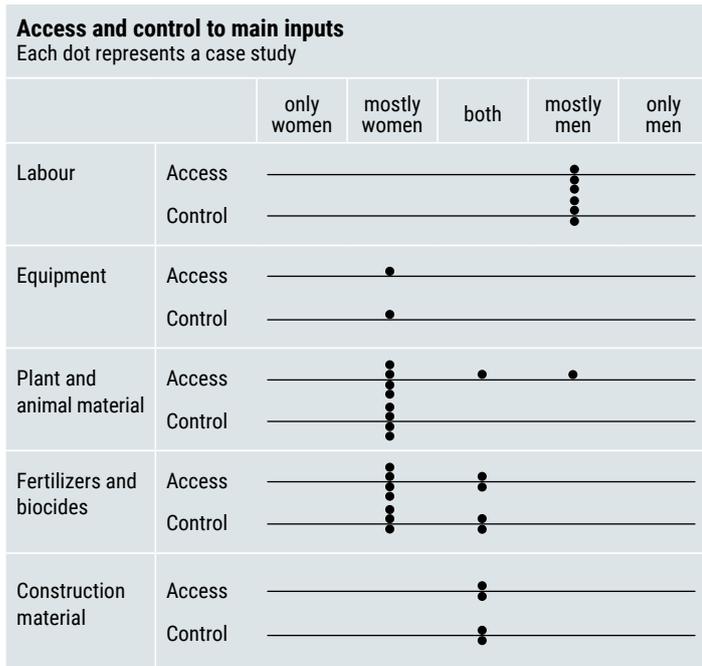
Agroforestry embraces a wide range of practices: these include alley cropping; dispersed trees; parkland systems; improved fallows; windbreaks and shelterbelts. Multi-storey cropping is most commonly associated with homegardens – which themselves are very varied.

Such systems can be found in all kind of environments from low rainfall (semi-arid and subhumid) areas with low tree densities and high rainfall areas (subhumid to humid) with high-density systems.

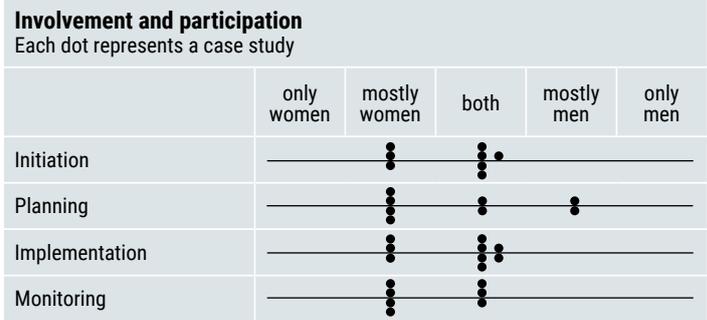
Policy recommendations

- Build awareness to address structural barriers, customary laws, beliefs and cultural norms that limit women’s mobility and their access to labour, land, financing and training.
- To increase a technology’s (or a set of complementary technologies’) appeal, uptake and ownership, involve women and men equally in design and allocation of steps in implementation.
- Provide innovative mechanisms and gender-specific incentives that facilitate access to finance by women, so that they can participate better in building agroforestry systems.
- Strengthen awareness about equal benefit-sharing through appropriate distribution of tasks in developing productive homegardens.
- Adapt specific technologies to the physical capacity of women: for example, establishing vegetative barriers of shrub and tree species instead of earth/ stone bunds.
- Train more female extension workers to provide tailored and gender-responsive advisory services.

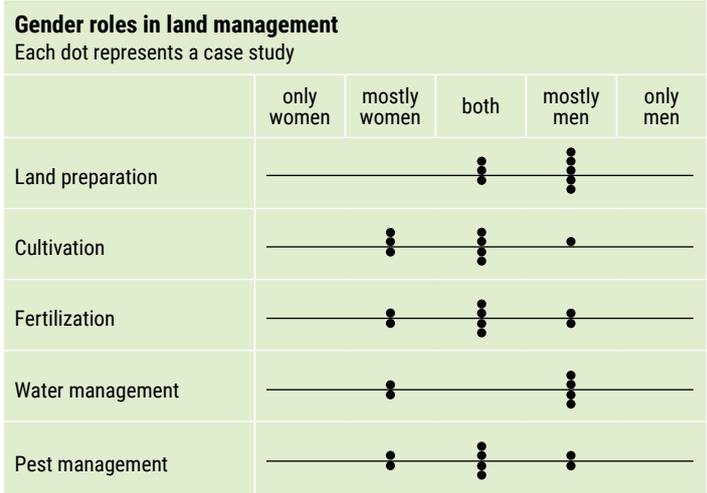
Technology-related aspects



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



Community-related aspects



Ownership and tenure rights

	Women number of case studies	Men number of case studies
Access to land	8 inherited 3 bought	8 inherited 5 bought
Quality of land	7 marginal land 6 fertile land	7 marginal land 6 fertile land
Tenure rights	5 individual (titled) 3 individual (not titled) 3 leased	5 individual (titled) 3 individual (not titled) 3 leased
Perceived land right security	0 low 1 medium 5 strong	0 low 1 medium 5 strong
Ownership of livestock	Large (5) and small (5) ruminants	Large (8) and small (4) ruminants

Land use rights

Type	Gender-specific number of case studies	Not gender-specific number of case studies
Statutory	0	7
Customary	1	0
Inheritance	3	5

Literature

Jhaveri, Nayna. 2021. Gender, tenure security, and landscape governance. PIM Flagship Brief November 2021. Washington, DC: International Food Policy Research Institute (IFPRI).

Teeken, B., Garner, E., Agbona, A., Balogun, I., Olaosebikan O., Bello, A., Madu, T., Okoye, B., Egesi, C., Kulakow, P., Tufan, H.A. (2021). Beyond "Women's Traits": Exploring How Gender, Social Difference, and Household Characteristics Influence Trait Preferences. *Front. Sustain. Food Syst.* 5:740926. doi: 10.3389/fsufs.2021.740926



The land user is applying the decomposed rice straw in her home garden; Photo: National Agriculture and Forestry Research Institute (NAFRI), Lao PDR

Rice straw mulching of vegetables in homegardens [Lao PDR]

Description

The use of decomposed rice straw in homegardens is an effective soil improvement practice. The decomposed rice straw helps to improve soil moisture, and provides organic matter to the soil. This is a cost-effective soil amendment practice and results in increased crop yields.

Land users store the rice straw in specific locations after the rice has been harvested. They stockpile the straw in parts of the rice field that had been water logged or at least in the wettest areas. This way, the rice straw absorbs water before being collected at a later stage. If the rice straw is not heaped, it will dry out and be dispersed by the wind. Typically, there are two times in the year when the farmers are active in the production of compost from rice straw. The first is in October after the rice has been harvested and when there is not a lot of rain. The second occasion is January to February, which allows a period of 4-5 months for the rice straw to decay after it has been collected. The only raw materials needed for rice straw compost are the decomposed straw and soil. Equipment required consists of a knife for cutting the straw, and bags for the collection, as well as a hoe for preparation of the vegetable plot.

The compost production process begins with collection of two bags (20 kg total) of decomposed rice straw from the rice field, which is then well mixed with one bag (10 kg) of soil. This mixture should be applied directly onto the vegetable plots before sowing. Experience shows that after application of the rice straw compost, vegetables grow strongly and are not disturbed by pests or insects. The soil gradually became darker, which is an indicator of good soil fertility. Currently, local people are able to cultivate three crops per year, which generates additional income for each household.

Women-friendliness of SLM Technology

Rice straw mulching is mostly implemented by women. But carrying rice straw from the paddy fields is hard work and an issue for women – because they cannot ride motor-bikes and therefore need help from their husbands.



Location:

Darktaor noy village, Darkchung district, Xekong province, Lao PDR

Land use:

Cropland – Annual cropping

Types of degradation addressed:

Soil degradation

Main purpose(s) of the technology:

- improve production
- reduce, prevent, restore land degradation
- create beneficial economic impact

References

Compiler of Gender Questionnaire:

Bounthanom Bouahom, National Agriculture and Forestry Research Institute

Date: December 2021

Key informant(s):

Thipchan, Provincial Agriculture and Forestry Office

Visit in WOCAT database:

qcat.wocat.net/en/summary/2062



Meeting with land users to discuss gender-related issues and collect gender-disaggregated data; Photo: Bounthanom Bouahom



Using rice straw mulching for soil improvement in the vegetable home garden; Photo: Bounthanom Bouahom

Main establishment and maintenance activities			
Activity	Labour by family	Reason	Labour
Plot preparation	Mostly men	Heavy workload	Hired: none Exchange*: none
Collect rice straw	Mostly women	Cultural Customs and taboos	Hired: no Exchange*: none
Carry rice from field to village	Mostly women	Cultural Customs and taboos	Hired: none Exchange*: none
Mix soil with decayed rice	Mostly women	Cultural Customs and taboos	Hired: none Exchange*: none

* Labour exchange within community

Cultural customs and taboos

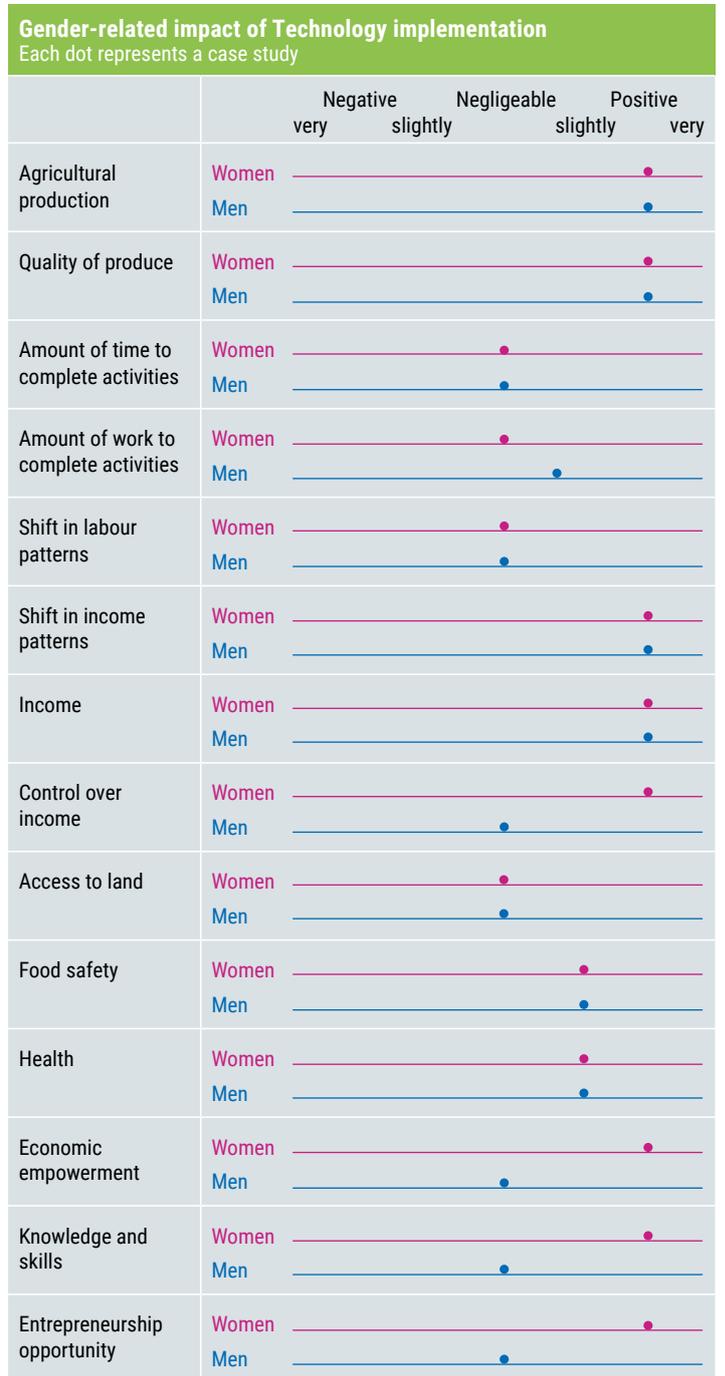
It is not allowed to bring cattle manure to the vegetable home garden.

Land tenure

Customary land use rights are gender-specific in favour of men. When women get married, they move to their husband's family and cultivate their land.

Recommendations to improve gender-responsiveness of the Technology?

The main issue in implementing this technology is the transportation of the rice straw from the paddy fields to the villages. Women do not ride motobikes and men do not have time for the transportation. The technology would be more gender-responsive if men can support women in the transportation.





Contour platforms on a slightly flat land plot with Vanilla plants which were covered with mulch; Photo: Gamini Warusamana

Individual platforms and contour platforms [Sri Lanka]

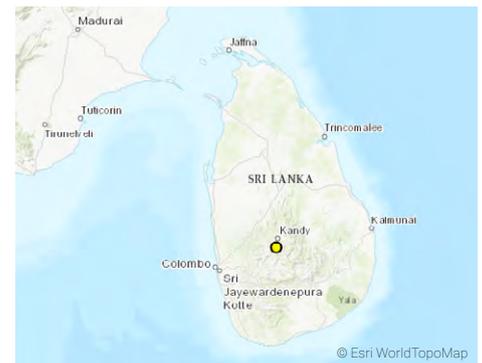
Description

Individual platforms and contour platforms are small terraces that control soil erosion in homegardens and enable the cultivation of vanilla as a cash crop.

Traditionally, homegardens with randomly planted perennial trees are shady. Therefore, farm families generally believe that cultivation of cash crops in their homegardens is impossible. The introduction of vanilla production, supported by small bench terraces termed “individual platforms” and “contour platforms” has proven the contrary. Vanilla is a shade-preferring crop, and it is highly valuable with potential to generate good income. The platform terraces help conserve soil.

Vanilla grows particularly well where the soil organic matter content is high. Organic matter required to enrich the soil can be collected directly from the homegardens (leaves and residues) and is also derived from organic kitchen waste. These organic residues are recycled into compost, and then used for the cultivation of vanilla. Additionally, mulching is practiced to control topsoil erosion. Each vanilla plant – a tropical climbing vine – grows up a previously planted two-meter-high *Gliricidia sepium* tree. *Gliricidia* serves on the one hand as a “living support stick” and provider of shade and, as a leguminous tree (family: Fabaceae), it has the potential to fix nitrogen in the soil.

Platforms (small terraces) are constructed and used for vanilla cultivation. The individual platforms are constructed around the planting hole and are one meter wide and two meters in length. The distance between two platforms is the same (minimum 2 meters) as the space between the vanilla plants. The lower edge of the platform has a shoulder bund or “lip”, stabilized with coconut husks, tree logs, and stones.



Location:

Doluwa, Central, Sri Lanka

Land use:

Agroforestry

Types of degradation addressed:

Soil erosion by water

Main purpose(s) of the technology:

- improve production
- reduce, prevent, restore land degradation
- protect a watershed/ downstream areas – in combination with other Technologies
- create beneficial economic impact

References

Compiler of Gender Questionnaire:

Rotawewa Bandara, Gunasena Nimal

Date: February 2022

Key informant(s):

Iroshani Senawirathna and Ekanayeka, both Government officers

Visit in WOCAT database:

qcat.wocat.net/en/summary/5757

qcat.wocat.net/en/summary/5177

Women-friendliness of SLM Technology

Women need men’s assistance in land preparation when the land slope becomes steep (slopes range from 5% to 45% in the village). Men plant *gliricidia* (*Gliricidia sepium*) as a shade and support tree. The women can easily attend to planting vanilla, tree training, fertilizing, pollination and harvesting.



Discussion group to test the gender questionnaire; Photo: Rotawewa Bandara



Stone terrace for vanilla cultivation; Photo: Bandara Rotawewa

Main establishment and maintenance activities			
Activity	Labour by family	Reasons	Labour
Construction of contour or individual platform	Both		Hired: none Exchange*: none
Reinforcement of the shoulder bunds with coconut husk/ tree logs/ etc	Both		Hired: none Exchange*: none
Preparing of compost and mixing it into the top soil	Mostly women	Cultural customs and taboos	Hired: none Exchange*: none
Vanilla plant training and pollination	Mostly women	Cultural customs and taboos	Hired: none Exchange*: none
Harvesting and marketing	Mostly women	Cultural customs and taboos	Hired: none Exchange*: none

* Labour exchange within community

Cultural customs and taboos

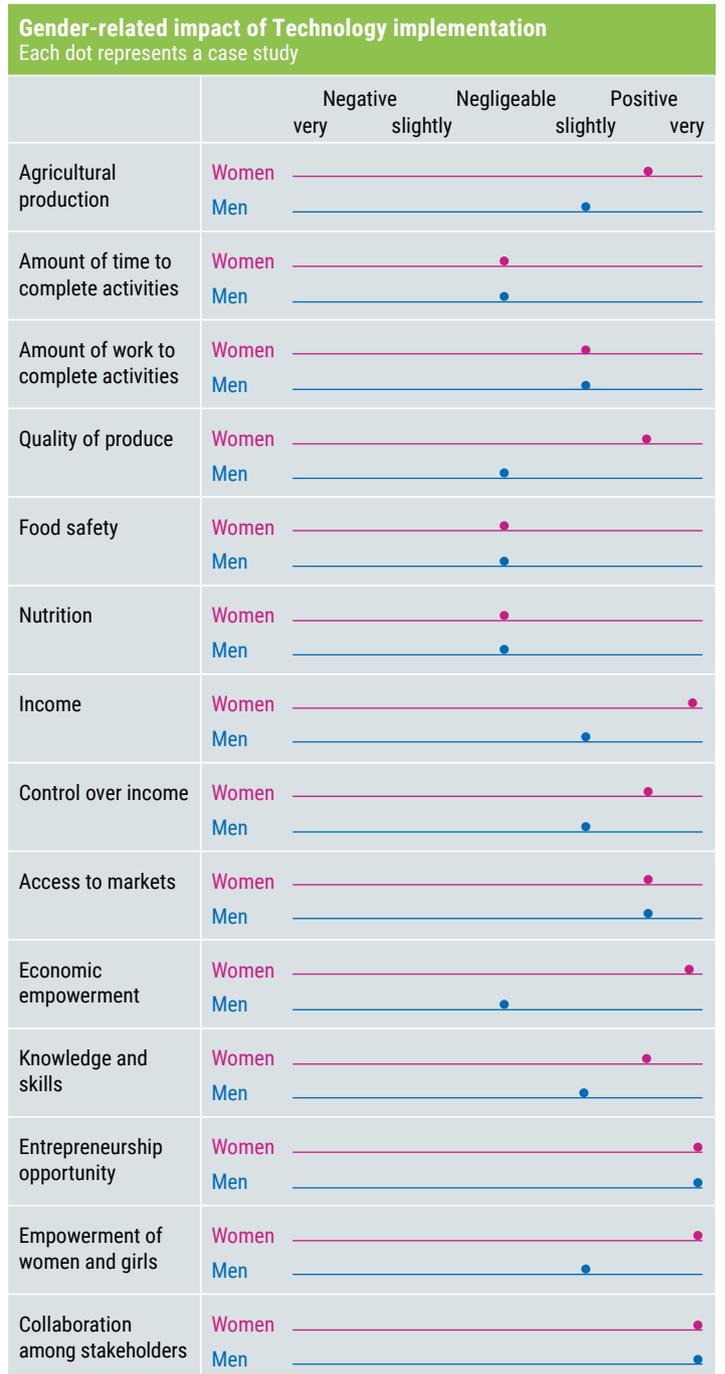
The society expects women to do a considerable amount of household work, take care of children and husbands; it's a common myth that a women are restricted to household tasks. Patriarchy and marriage support this marginalization as an accepted norm.

Land tenure

Sri Lanka constitution is non discriminatory on land ownership. Though the constitution implies equal rights, there are some inequalities with regards to ownership of land and property under 'personal laws' operating in the country.

Recommendations to improve gender-responsiveness of the Technology?

Implementing this technology is time-consuming; off-season months are suitable to introduce the technology when women and men can spend more time for establishment activities. Men's participation in weeding and plant training will ease women's workload.





WATER AND IRRIGATION

Gender and Sustainable Land Management (SLM)

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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.

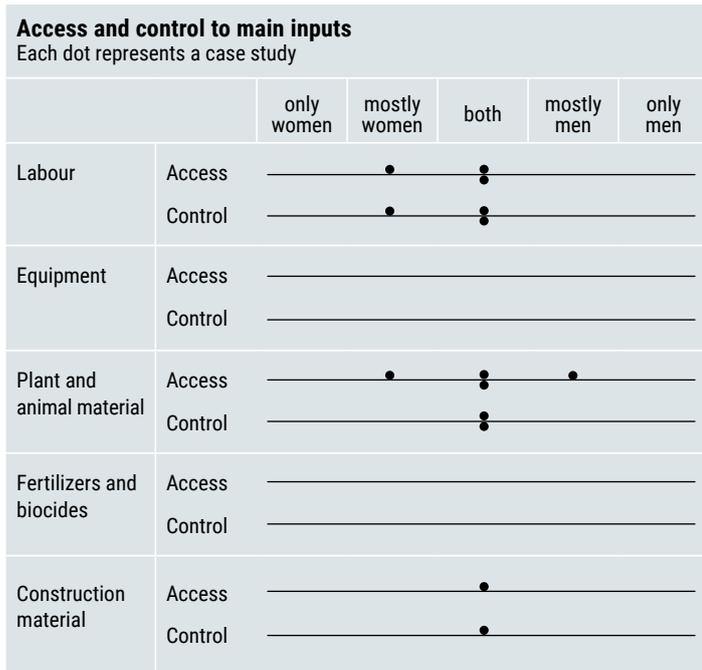
Rainwater harvesting optimises the productivity of limited water resources. It also reduces risk of production failure by minimizing the effects of drought and dry spells. Furthermore, it enhances agricultural production, improves water use efficiency, increases access to water, reduces off-site damage 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

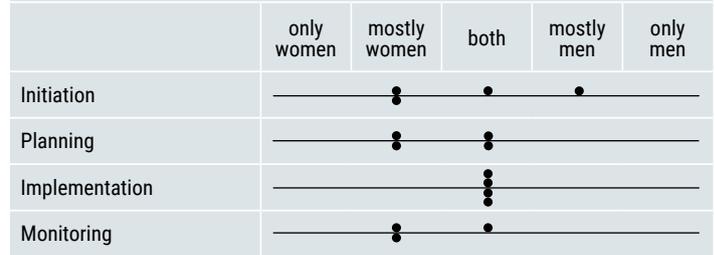


Access: Right to use resources **Control:** Power to decide on the use of resources



Involvement and participation

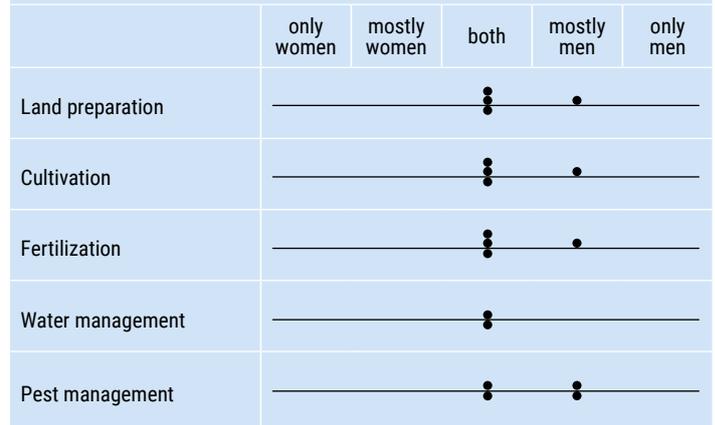
Each dot represents a case study



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 addressed:

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 Narayanan 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.

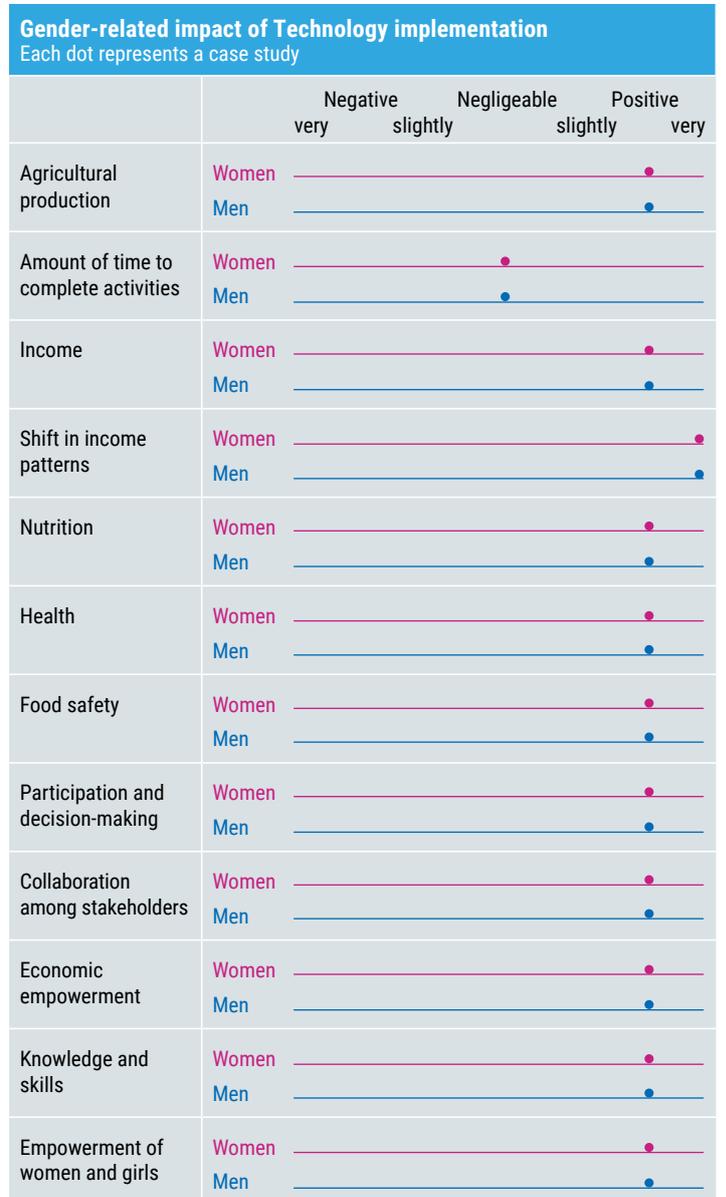
Land tenure

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.





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 addressed:

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.

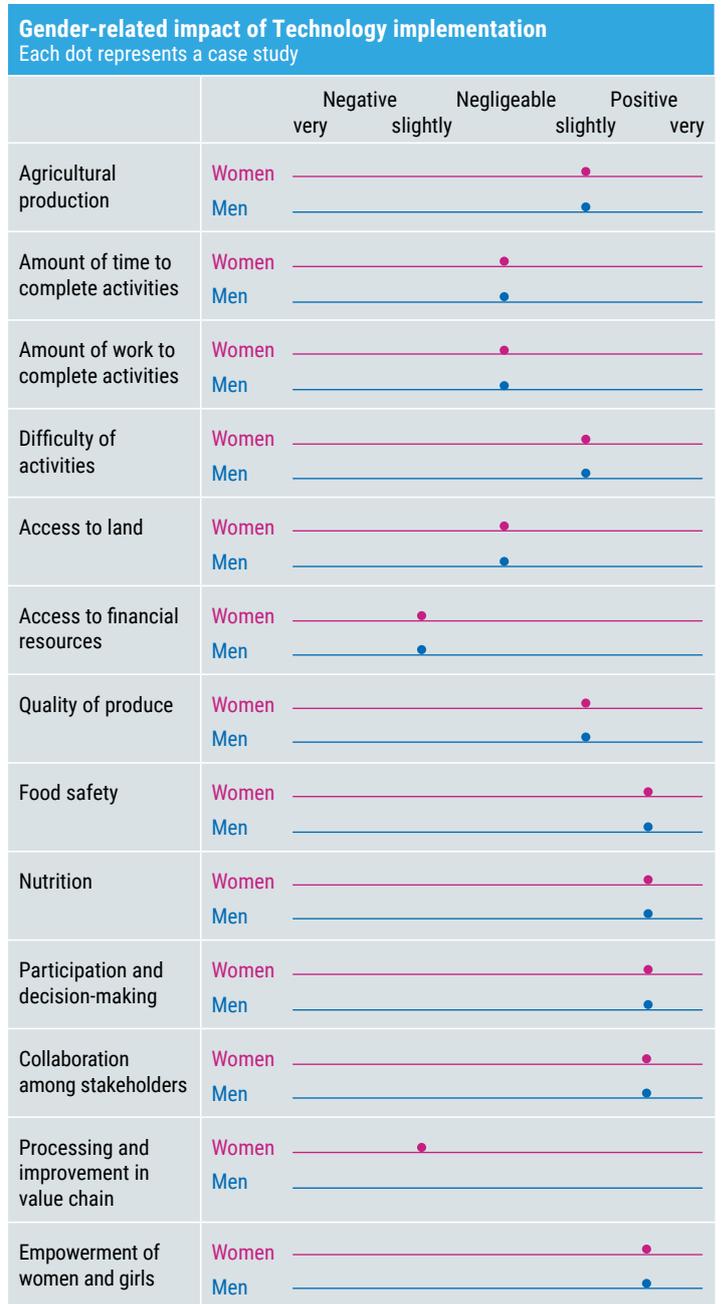
Land tenure

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





FEED AND FODDER FOR LIVESTOCK

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 2 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.

Improving animal nutrition: managing rangeland, pastures and crop-livestock systems

Pastoralism means extensive production systems of livestock using pastures – of grasses and herbs for grazing, and bush and trees for browsing. It is based on open grazing lands: these include savannahs, grasslands, prairies, steppes and shrublands. They are managed through herding – or mobility mechanism including nomadism and transhumance. Fire is often still used as a tool to curb bush and stimulate regrowth. Many pastoralists actually practice “agro-pastoralism” where livestock raising is combined with opportunistic cropping. In integrated crop-livestock systems, which incorporate more intensive production practices, the waste product of one serves as a resource for the other. So, manure is used to enhance crops, while crop residues and by-products provide supplementary feed to animals.

Pastoralism is based on continuous adaptation to highly uncertain environments, especially climate. At its best, it combines economic production in marginal land, with the benefits of carbon sequestration and environmental protection. Well-managed crop-livestock systems increase crop yields, improve soil fertility, reduce erosion, improve livestock productivity and health and reduce reliance on external inputs.

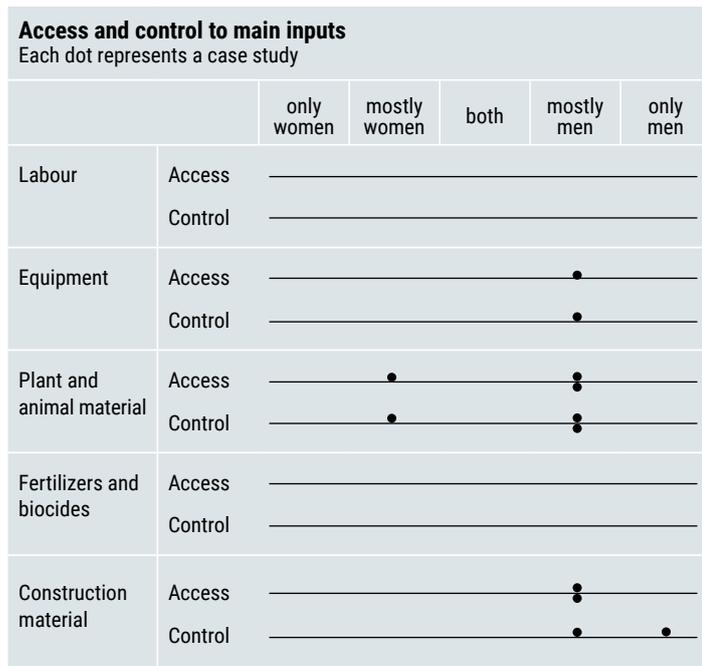
Technologies include establishment of feed banks; improvement of herd composition and health; a more strategic distribution of watering points; adaptive/ rotational grazing; land use plans and effective communal tenure and governance systems. There are also shifting night enclosures; fodder planting, hay making, and stall-feeding systems.

Pastoralism is mainly found in arid and semi-arid areas, while integrated crop-livestock systems prevail in subhumid to humid areas.

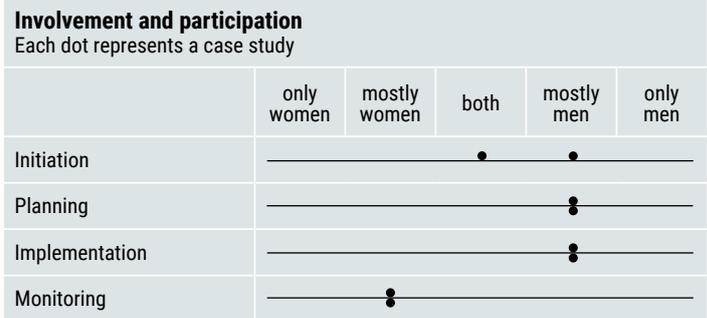
Policy recommendations

- Security of land tenure is key: it must be given priority.
- Strengthen legal awareness of rules pertaining to resource rights, urgently, within communities.
- Rules of inheritance and access to land and its resources need to be clarified – and made more equitable for women and men – to ensure optimal livestock management.
- Affordable technology for women can be facilitated by providing flexible payment solutions: thus always consider payment by instalments, or by proving technology in increments.
- Enable access to credit on low interest terms – and without collateral – as this is especially important for women, in order for them to participate in livestock enterprises.
- Support women’s savings and credit groups. This is a proven method of building their ability to invest in inputs.
- Provide assets, such as dairy cows, sheep or goats: this is a powerful way to provide valuable, and valued, start-up capital.
- Build women’s entrepreneurial skills and financial literacy: this empowers them to control, and benefit from, new technology related to livestock enterprises.

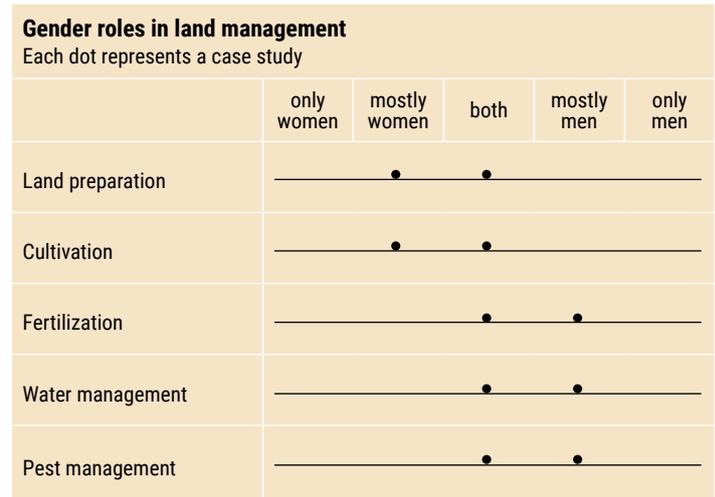
Technology-related aspects



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



Community-related aspects



Ownership and tenure rights

	Women number of case studies	Men number of case studies
Access to land	2 inherited 2 bought	2 inherited 2 bought
Quality of land	2 marginal land	2 marginal land
Tenure rights	1 open access 1 individual (titled) 2 individual (not titled) 1 shared	1 open access 1 individual (titled) 2 individual (not titled) 1 shared
Perceived land right security	1 low 0 medium 1 strong	1 low 0 medium 1 strong
Ownership of livestock	Few large and small ruminants	Many large and small ruminants

Land use rights

Type	Gender-specific number of case studies	Not gender-specific number of case studies
Statutory	0	2
Customary	2	0
Inheritance	1	1

Literature

Flintan, F. 2021. Pastoral women, tenure and governance. ILRI Research Report 92. Nairobi, Kenya: ILRI.

Najjar, D., & Baruah, B. (2021). Gender, livestock rearing, rangeland use, and climate change adaptation in Tunisia. ICARDA.

Ravichandran, T., Farnworth, C.R. Galiè, A. (2021). Empowering women in dairy cooperatives in Bihar and Telangana, India: A gender and caste analysis. Agri-Gender Journal of Gender, Agriculture and Food Security 6(1):27-42.



Throughout seasons of abundant forage, farmers make hay to feed to the goats during the dry season when pastures are scarce; Photo: Priscilla Vivian Kyosaba

Semi-intensive goat farming for pasture conservation [Uganda]

Description

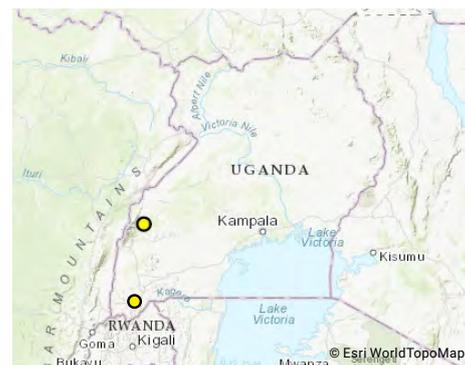
In a semi-intensive system, animals are kept under confinement in which they are stall-fed for a period of weeks to months, especially during the dry seasons, followed by a period of open grazing/ browsing during the rainy season.

This semi-intensive goat rearing practice is a compromise between extensive and intensive grazing/browsing systems. It is practiced where there is a shortage of pasture during the dry season, and high chances of spreading diseases. The goats are kept under confinement for weeks to months, especially during the dry season. Shelter for the goats is made from relatively cheap materials that are readily available to the farmers. A farmer can rear 70 goats on a 0.4 ha plot of land using this technology.

During the dry season, the animals are fed on maize bran, iodized salt, peelings from bananas, cassava, and sweet potatoes, improved grasses (Napier), and forage species planted along the boundaries of banana plantations.

The extensive system is practiced during rainy season where the farmer grows a mixture of fodder species including sesbania trees and Napier grass grown on half a hectare of land. Sesbania is a fast-growing leguminous tree. The leaves of sesbania are highly palatable and liked by goats. The protein content is about 25%. Sesbania is spaced at 100 cm x 100 cm, and Napier grass is planted in rows at a spacing of 60 cm x 60 cm.

Throughout seasons of abundant forage, farmers harvest the forage together with grasses, and make hay to feed to the goats during the dry season when pastures are scarce. The cost of harvesting the hay is comparable to the cost of paying a herdsman in open grazing systems.



Location:

Kabale District, South Western Uganda and Kabarole District, Western Uganda

Land use:

Grazing land – Intensive grazing/ fodder production

Types of degradation addressed:

Biological degradation
Physical soil deterioration

Main purpose(s) of the technology:

- improve production
- create beneficial economic impact
- prevention of diseases

References

Compiler of Gender Questionnaire:

Priscilla Vivian Kyosaba, Uganda Land Care Network

Date: January 2022

Key informant(s):

Byarugaba Kenneth, Chairman

Visit in WOCAT database:

qcat.wocat.net/en/summary/3363

Women-friendliness of SLM Technology

The technology is most easily applied by men – as they own land and animals and have a financial advantage over women. Nevertheless, women can potentially be involved in the stall-feeding process itself.



Visiting the goat-shelter after the group discussion; Photo: Priscilla Vivian Kyosaba



Goats are kept under confinement during dry season in which they are stall-fed; Photo: Priscilla Vivian Kyosaba

Main establishment and maintenance activities

Activity	Labour by family	Reason	Labour
Acquiring space for structure	Mostly men	Heavy workload, farm management decision	Hired: mostly men Exchange*: none
Construction of animal shelter or stalls	Mostly men	Heavy workload	Hired: mostly men Exchange*: none
Acquiring goats	Mostly men	Farm management decision	Hired: none Exchange*: none
Cutting pastures and feeding animals	Mostly women	Farm management decision	Hired: both Exchange*: none
Cleaning animal stalls or shelters	Mostly women	Heavy workload, farm management decision	Hired: both Exchange*: none

* Labour exchange within community

Cultural customs and taboos

Intra clan marriage is a taboo.

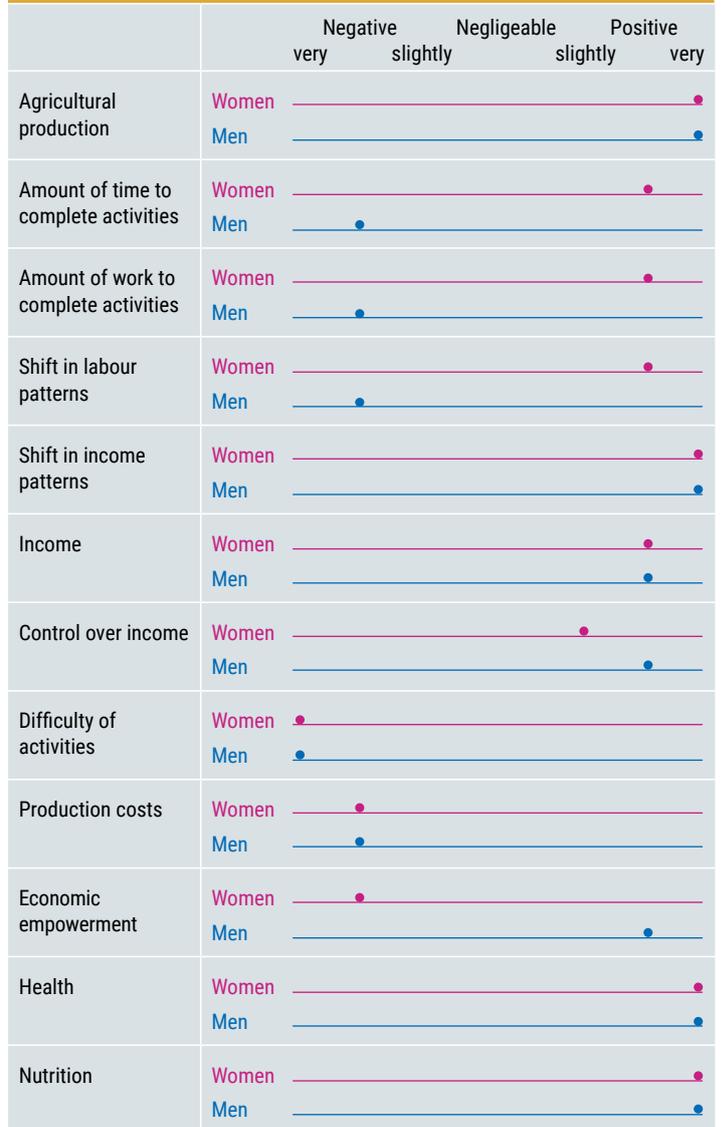
Land tenure

Women and men have the same rights to inheritance however distribution depends on the person leaving the assets i.e. land. Men are mostly considered when land is distributed in family. Statutory land use rights are not gender-specific and therefore treat men and women equally.

Recommendations to improve gender-responsiveness of the Technology?

The main constraints in applying this technology are high implementation and maintenance costs (e.g. establishment of shelter, acquiring the animals etc). As men have better access to land and financial resources, they mostly engage in the establishment activities. Gender-responsiveness can be improved in supporting access to finances for men and women equally.

Gender-related impact of Technology implementation
Each dot represents a case study





Stall Feeding of a Friesian Cow to facilitate the collection of manure for soil fertility improvement; Photo: Priscilla Vivian Kyosaba

Stall-feeding of dairy cows through “cut-and-carry” [Uganda]

Description

This technology involves zero grazing by cut-and-carry feeding. Cows are confined inside a stall, and feed and water are provided.

Due to land fragmentation and conflicts, traditional grazing systems where animals are reared on open grasslands is no longer feasible, or sustainable, since grassland is limited and stray animals destroy neighbouring crops. For dairy farmers, stall-feeding is an innovative and promising system.

In this practice, a Friesian dairy cow and her calf are confined inside a stall. The stall has four partitions. A calf room, a milking parlour, a feeding and drinking area, and a resting room. Within the feeding area is a wooden box of 0.5 m x 1.5 m into which feed is placed for the animal. A half drum that holds 80 liters of water is also located there. Both the wooden feeder and half drum are raised to a height of 0.5 m above the ground surface to prevent contamination of the feed with dung and urine. The farmer cultivates 0.4 hectares of Napier grass, which provides adequate feed for the demands of the cow (75-100 kg of fresh grass per day). The Napier grass is cut, chopped and put inside the wooden trough, while water is fetched from the stream and poured into the half drum.

Through this method, animal movement is restricted. This reduces the exposure to parasites such as ticks which cause diseases such as the deadly East Coast Fever. This practice also reduces land conflicts caused by stray animals destroying neighbours' crops. The animal does not waste energy to look for pasture and water, hence milk productivity is enhanced. Manure is also deposited within the feeding area and thus easy to collect for composting and then application to the farmers' crop and pasture fields. Animals do not need to be attended to, hence the farmer has more time to rest and carry out other activities.

Women-friendliness of SLM Technology

The technology is easily applied by men as they own land and animals and have the financial strength over women. Nevertheless, there are many women involved in such systems in Uganda.



Location:

Northern Region and Rubanda District, South Western Uganda

Land use:

Grazing land – Intensive grazing/ fodder production and Cropland

Types of degradation addressed:

Chemical and physical soil deterioration

Main purpose(s) of the technology:

- create beneficial economic impact
- create beneficial social impact

References

Compiler of Gender Questionnaire:

Rick Kamugisha, Uganda Land Care Network

Date: January 2022

Key informant(s):

David Musinga, Local Council Leader

Visit in WOCAT database:

qcac.wocat.net/en/summary/5466



Interviewing the key informant before the group discussion; Photo: Priscilla Vivian Kyosaba



The cows do not graze but are confined inside the stall, feed and water is provided for the animals; Photo: Issa Aiga

Main establishment and maintenance activities			
Activity	Labour by family	Reasons	Labour
Land excavation	Only men	Heavy workload	Hired: only men Exchange*: none
Installation of the stalls, fence, roof and floor	Only men	Heavy workload	Hired: mostly men Exchange*: none
Land preparation/ planting of pastures	Both		Hired: none Exchange*: none
Cut and carry of feed	Mostly women	Migrated men	Hired: mostly men Exchange*: none
Cleaning	Mostly women	Migrated men	Hired: none Exchange*: none
Milking	Mostly men	Heavy workload	Hired: mostly men Exchange*: yes

* Labour exchange within community

Cultural customs and taboos

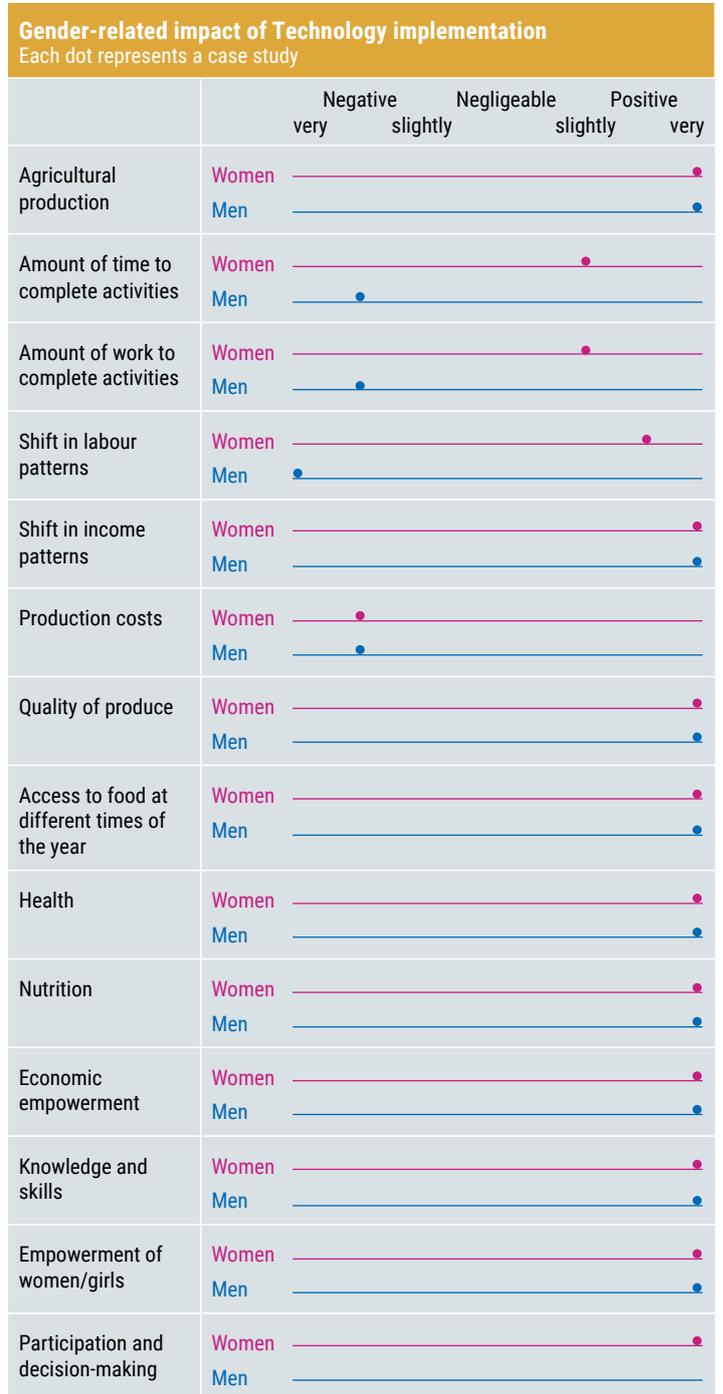
Intra clan marriage is a taboo.

Land tenure

National laws give equal access and use of land to both women and men in the courts of law although at community level customary rights are considered. Customary inherited land usually favors men. Women only inherit land of their deceased husbands. Most water sources are public entities which are equally accessed by both men and women.

Recommendations to improve gender-responsiveness of the Technology?

The technology is mostly implemented by men because they own most of the land and have easier access to finances. The gender-responsiveness could be improved by women's participation in decision-making and access to land and financial resources (e.g. low interest loans with no collateral needed).





NATURAL AND SEMI-NATURAL FORESTS

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.



Trees: providing hotspots of biodiversity and carbon capture for people and nature

Forests have multiple functions and uses: they are vital for humanity and nature – but also have an important productive function. They are havens for conservation of biodiversity in a wide variety of ecological conditions. Forests provide goods including wood (fuel and building materials/commercial logging), fruits, fodder for livestock, and non-timber forest products (honey, medicines, mushrooms, bark, etc.) and vital services including desertification control in drylands, biodiversity conservation, improving water quality, and protecting freshwater resources while feeding rivers and groundwater tables.

The key environmental benefits derived from forests can be summed up as conservation of biodiversity, protection against water and wind erosion, and improved water management and quality. Simultaneously, direct socio-economic benefits include improved livelihoods and well-being through income diversification. Forests are fundamental to climate change mitigation and adaptation.

In drylands, sustainable forest management practices include reduced deforestation; fire management; restoration through natural and assisted regeneration; “enrichment planting”; selective planting and felling; participatory and community-based management; and schemes to pay for ecosystem services.

Dry forests cover a spectrum from deciduous forest in moist savannahs to dry deciduous woodlands and dry savannahs. Such landscapes are very variable, with cropland, grazing land and woodlands existing side by side. Rainforests cover tropical and mountain areas. In many countries, rainforests are now restricted to inaccessible mountain areas and to coastal and river zones.

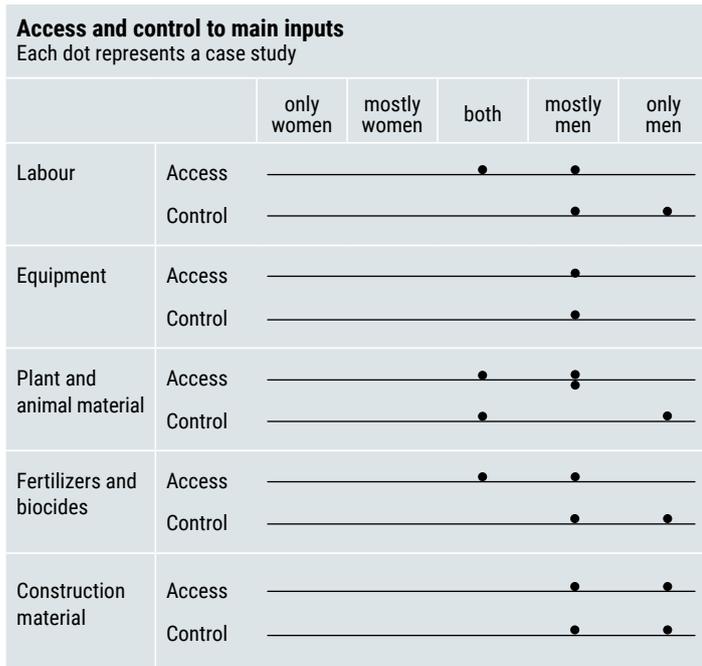
Methods and data

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 3 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.

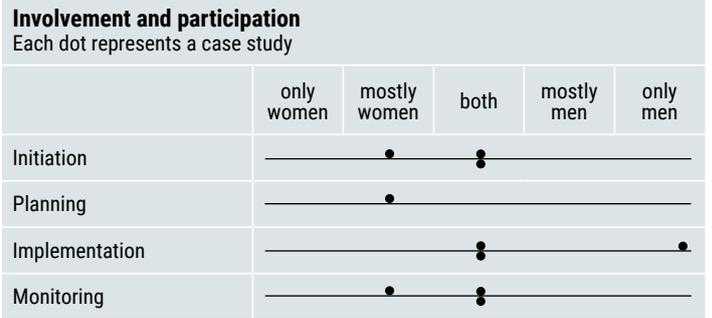
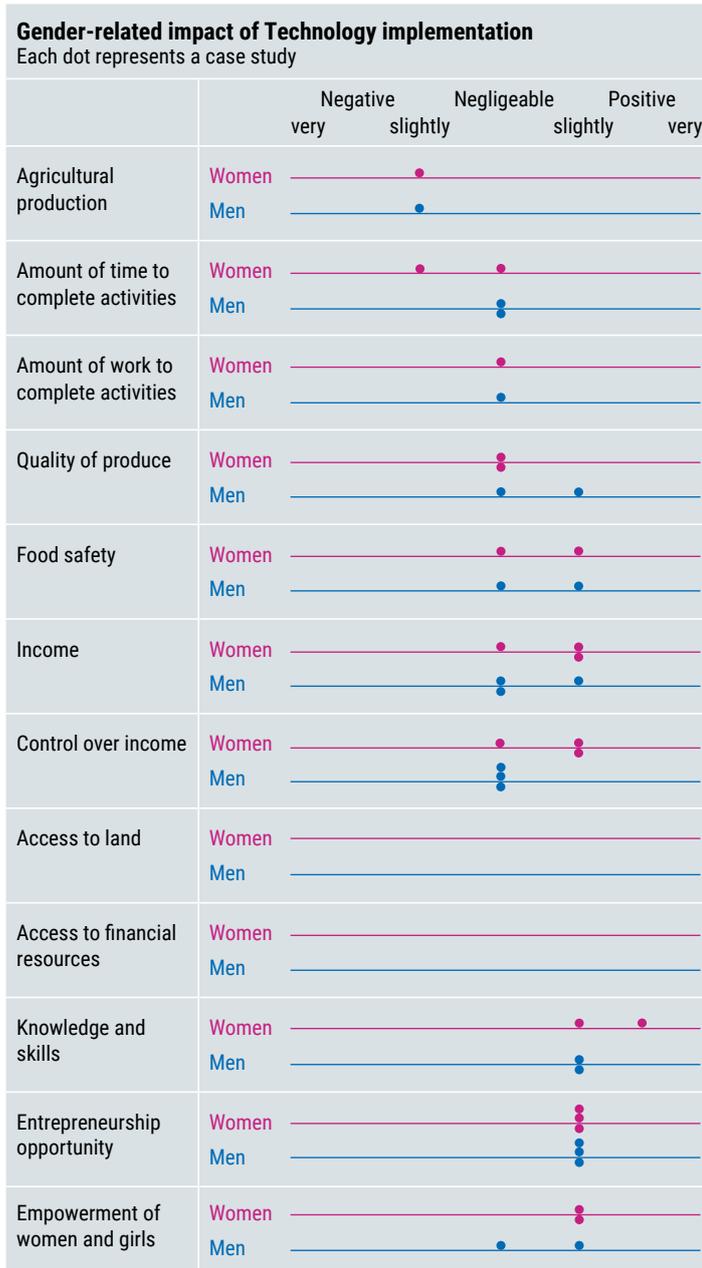
Policy recommendations

- Facilitate bottom-up approaches, including men and women equally, in the forestry sector, to strive for equity in technology planning and design.
- Strengthen community awareness about forest land and resource rights as well as the role of women in SLM.
- Raise awareness of the gender-specific rights and management responsibilities of land, forest (and even individual trees), as well as gender-related challenges.
- Create enabling environments: in particular improve input supply to empower women economically and strengthen the perception of their role as farmers in the community.
- In situations such as removal of invasive alien species and land restoration through sponsored schemes, improve uptake through equal wages for equal work.
- Improve recognition of local innovation in community forest management.
- Enable women’s participation in income generation from (non-timber) forest resources, while respecting their religious norms (e.g. women-only working groups/hours).
- Address structural barriers, customary laws, beliefs and cultural norms related to trees and forests: build awareness of those relating to gender.

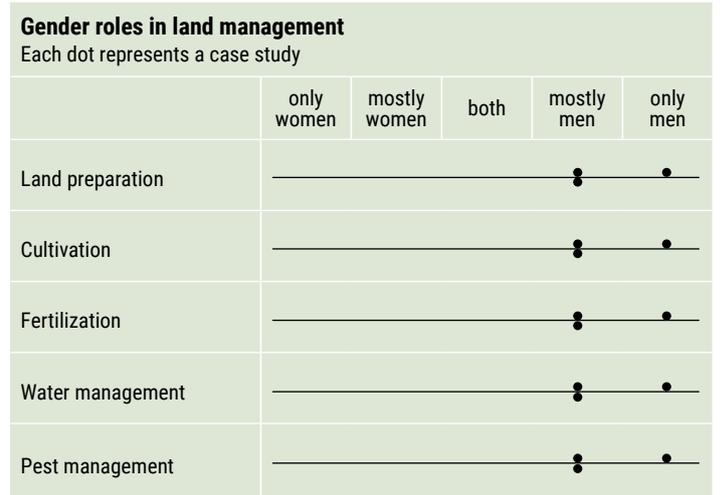
Technology-related aspects



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



Community-related aspects



Ownership and tenure rights

	Women number of case studies	Men number of case studies
Access to land	3 inherited 1 bought	3 inherited 1 bought
Quality of lan	2 marginal land 3 fertile land	2 marginal land 3 fertile land
Tenure rights	1 individual (titled) 2 individual (not titled)	1 individual (titled) 2 individual (not titled)
Perceived land right security	2 low 0 medium 1 strong	2 low 0 medium 1 strong
Ownership of livestock	Large ruminants	Small and large ruminants

Land use rights

Type	Gender-specific number of case studies	Not gender-specific number of case studies
Statutory	0	2
Customary	0	2
Inheritance	2	1

Literature

Jhaveri, Nayna. 2021. Gender, tenure security, and landscape governance. PIM Flagship Brief November 2021. Washington, DC: International Food Policy Research Institute (IFPRI).

Dick Frederiksen, S.; Elias, M., Zaremba, H.; Aynekulu, E. (2021). Developing gender-equitable ecological restoration initiatives: A synthesis of guidance to improve restoration practice. Rome (Italy): The Alliance of Bioversity International and CIAT. 58 p.



The Abril family opening a stingless bee nest for honey collection; Photo: Natalia Roa

Traditional native beekeeping [Colombia]

Description

Beekeeping with the native stingless bee (*Melipona favosa*) produces honey and protects bees and plants found in forest and savannah ecosystems. The traditional practice of capturing wild nests permits the extraction of honey from the same nest for up to 30 years.

Native bee honey production in the floodable savannahs of the eastern Colombian Llanos (the Orinoco River Basin), relies on stingless bees of the species *Melipona favosa*. These bees nest inside tree trunks. The nests are retrieved either by rescuing them from rotten trees on the ground, or by cutting the branch with the nest, and then keeping the nest in place on the branch which is removed and taken home. In the case of the retrieved nests, the beekeepers study the outside of the nest and listen to the bees inside. With this information, they cut out a window. Once opened, they verify the location of the honey and pollen pots and the broods. They will then check every day for the presence of the sentinel bee and bee activity. Furthermore, they only extract honey at the end of the dry season when bees have enough food reserves. For the extraction, they will reopen the previously cut window, and take the honey and pollen pots, making sure enough is left behind so that bees can have access to food as well. The mean honey production from each nest is around the 750 -1000 ml.

The main benefits of native bee keeping is that it is sustainable, promotes conservation of native ecosystems, and constitutes a unique sustainable and profitable direct use of local biodiversity in the floodable savannahs of the eastern Llanos in Colombia. It is sustainable because honey can be extracted without damaging the bees.



Location:

Vereda Los Chochos, Trinidad, Colombia

Land use:

Forest / Woodlands
Extensive grazing lands

Types of degradation addressed:

Physical soil deterioration
Biological degradation
Soil erosion by water and wind

Main purpose(s) of the technology:

- improve production
- conserve ecosystem
- preserve/ improve biodiversity
- create beneficial economic impact

Women-friendliness of SLM Technology

Traditional native beekeeping as practiced in Los Chochos requires considerable effort and strength to carry the heavy trunks to the home and then to manipulate them. These tasks are mostly performed by men. Women participate in the observation of the hive behaviour and other less physically arduous tasks.

References

Compiler of Gender Questionnaire:

María Paula Barrera, ABC Colombia

Date: January 2022

Key informant(s):

Damaris and Hector Abril, land users

Visit in WOCAT database:

qcat.wocat.net/en/summary/5965



Meeting with community Los Chochos to discuss gender-related issues and collect gender-disaggregated data; Photo: Beatriz Ramirez



Héctor Abril, holding the opened window and seeing the pots inside the nest; Photo: Natalia Roa

Main establishment and maintenance activities			
Activity	Labour by family	Reason	Labour
Hive extraction and transfer	Mostly men	Heavy workload	Hired: none Exchange*: none
Opening of a window in the nest	Mostly men	Heavy workload	Hired: none Exchange*: none
Checking the bee nests	Mostly women	Because women usually are at home	Hired: none Exchange*: none
Honey collection	Both		Hired: none Exchange*: none

* Labour exchange within community

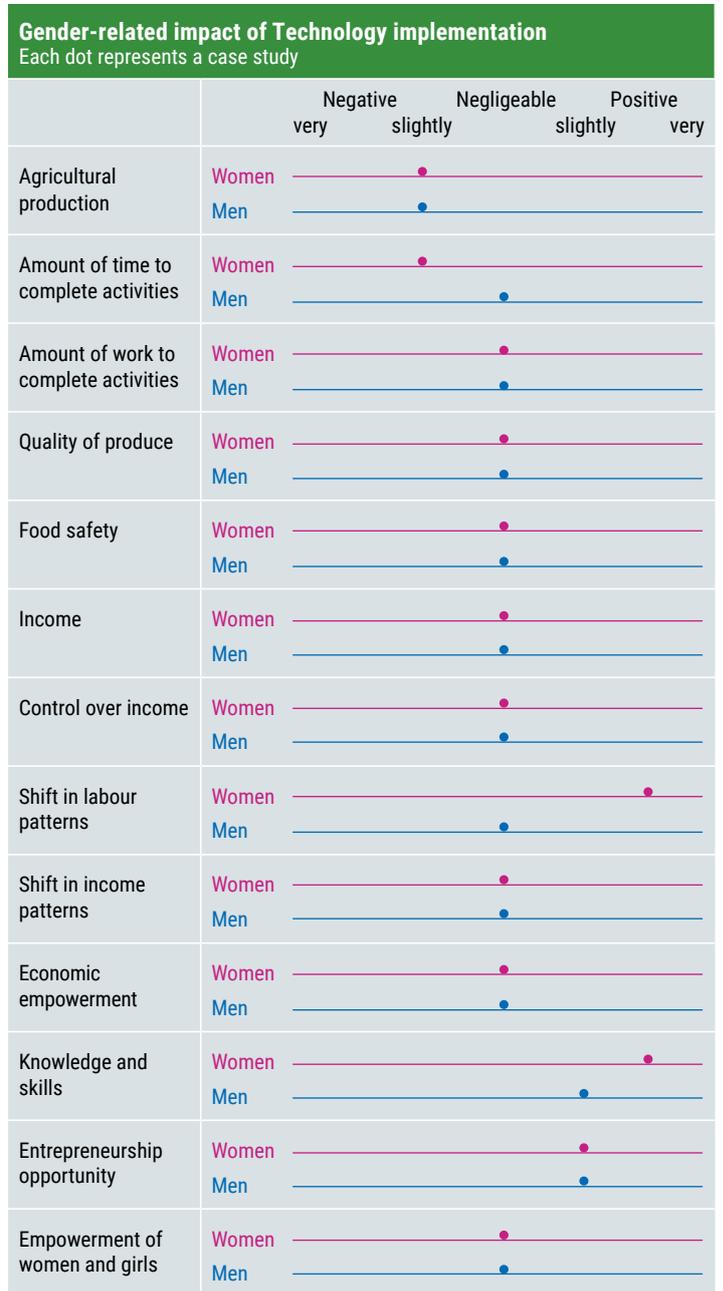
Cultural customs and taboos
—

Land tenure

Men and women inherit equally. Statutory and customary land use rights are not gender-specific. The land use rights are based on national laws, some of them prohibit land titles because of land adjudication to a petroleum company. However, the lands can be inherited or bought.

Recommendations to improve gender-responsiveness of the Technology?

Most of the differences are related to physical strength between women and men, but they are not perceived as a hindering factor because the rational hives makes easier access to all the process. The community perceives the different roles (because of physical strength) as a normal, even natural gender condition. Nevertheless, improved participation of women in applying the technology and an understanding about their tenure rights are key to improve gender equality in land management.





Assisted Natural Regeneration in Medhakachapia National Park (MKNP); Photo: Fazlay Arafat

Assisted Natural Regeneration [Bangladesh]

Description

Assisted natural regeneration (ANR) is a simple, low-cost forest restoration method that can effectively convert deforested lands to more productive forests.

Medhakachapia National Park (MKNP) is nationally known for protecting the most extensive stands of mature critically endangered Garjan (*Dipterocarpus turbinatus*) trees in Bangladesh. Other native trees present in the MKNP include Telsur (*Hopea odorata*), Boilam (*Anisoptera scaphula*), Gamar (*Gmelina arborea*) and Chapalish (*Artocarpus chaplasha*). Originally, the entire park area was densely covered with Garjan forest, but now there are only about 9000 mature Garjan trees – as many parts have been encroached upon with agriculture. In order to restore forest health, the Bangladesh Forest Department introduced an “Assisted Natural Regeneration” (ANR) practice.

ANR aims to accelerate, rather than replace, natural succession processes by removing or reducing barriers to natural forest regeneration, such as competition with weedy species and recurring disturbances (fuelwood collection, grazing, fire and wood harvesting etc.). Compared to conventional reforestation methods, which involve planting tree seedlings, ANR offers the significant advantage of avoiding costs associated with propagating, raising, and planting seedlings. ANR is most effectively utilized at the landscape level in restoring forest protective functions, such as soil protection, and is most suitable for restoring areas where some level of natural succession is already in progress. ANR offers distinct advantages over other forest restoration methods but also has some limitations. ANR is much cheaper to implement and can be applied over larger areas than other restoration approaches, but may be less effective in enhancing floristic diversity during the initial stages. Some of ANR’s disadvantages can be overcome by enrichment planting with desirable species.

Women-friendliness of SLM Technology

Assisted natural regeneration can be implemented easily by both women and men. No special technical knowledge or tools are required. The various activities, including nursery management, site preparation, planting trees, fertilizer application, weeding and other silvicultural interventions can be conducted by men or women. Community patrolling groups of men and women can equally care for the plantation site while ensuring protection from grazing, fire, and illicit felling.



Location:

Medakachapia National Park, Cox's Bazar, Bangladesh

Land use:

Forest/ woodlands

Types of degradation addressed:

Soil erosion by water
Biological degradation

Main purpose(s) of the technology:

- reduce, prevent, restore land degradation
- conserve ecosystem
- create beneficial social impact

References

Compiler of Gender Questionnaire:

Fazlay Arafat, Bangladesh Forest Department; Tania Akter, University of Chittagong

Date: January 2022

Key informant(s):

Mohammad Muktul Hossen, village chief

Visit in WOCAT database:

qcat.wocat.net/en/summary/4372



Meeting with the community living in the periphery of the forest to discuss gender-related issues; Photo: Fazlay Arafat



Uncovering seedlings from grass to accelerate natural succession processes; Photo: Fazlay Arafat

Main establishment and maintenance activities			
Activity	Labour by family	Reasons	Labour
Clearing the area, tying up seedlings with sticks	Both	Farm management decision	Hired: both Exchange*: yes
Fertilization	Both	Farm management decision	Hired: both Exchange*: yes
Weeding	Both	Farm management decision	Hired: both Exchange*: yes
Climber cutting, thinning, pruning	Both	Farm management decision	Hired: both Exchange*: yes

* Labour exchange within community

Cultural customs and taboos

Most of the cultural customs and taboos in the community are guided according to Islamic norms. Women are not encouraged to go out of their homes unless extreme necessities. Girls usually get married at the age of 16-22. Women are discouraged not to go out of home without a proper Islamic dress code.

Land tenure

Men and women do not inherit equally. They follow the Islamic law of inheritance to distribute the land. According to Islamic jurisprudence, a son gets a share which equals the share of two daughters. The community does not have any legal rights on the land as they are staying as encroacher in forest land. Landless male-headed families and female-headed families encroached on the forest land for their living. However, they are not allowed now to increase their landholdings through further encroachment, but they are enjoying their customary land use rights within their already encroached land.

Recommendations to improve gender-responsiveness of the Technology?

For equal share of men and women to apply this technology, women must have access to public life and paid work (wages) without challenging cultural and religious traditions. Currently, men have higher wages as women for the same work. Furthermore, bottom-up approaches for design and planning of the technology are key. Labour division and timing of tasks have to be addressed in such an approach.

