



Case studies on adoption of Sustainable Consumption and Production (SCP) practices adjacent to Kakamega forest in Western Kenya

SCP practices in seed collection, storage and seed bed preparation:

Over 316 community members of the MSMEs have adopted Sustainable Consumption and Production (SCP) practices in seed collection and storage, and seed bed preparation for improved cultivation of medicinal plants and other crops.



Previous seedbed of one of the community household.



Improved seedbed constructed using the toolkit provided by the project



A modified seedbed of one of the community members made using banana stems and with fencing for protection from livestock damage.

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Sustainable consumption and production (SCP) through use of measurements in cultivation practices

The use of standard measurement approach in cultivation that has been promoted by the project has been adopted by over 111 community members of the 10 MSMEs. The community members have adopted the cultivation of plants in straight lines and specified spacing. This has resulted in maximization of land use by enabling the plot to accommodate more plants as opposed to random cultivation and broadcasting of seeds. In addition, it has enabled intercropping and easier weeding, watering, mulching, harvesting and other farm management activities.

Table 1 shows benefits of the use of measurements and straight row planting in cultivation of *Ocimum kilimandscharicum* on a 100 square metres area of land of one of the farmers. Measurements and planting in rows led to 15% increase in the number of plants in, and yield and income from the land.

Table 1: Comparison of number of *O. kilimandscharicum* plants, yield and produce value on a 100 square metres area of land with measurements and straight rows, and without (random).

Cultivation practice	No. of plants	Yield (Kg)	Value (Ksh)
Random	380	127	1,270
Measured	436	145	1,450



Straight row planting and use of measurement practices in cultivation was promoted by the Action and adopted by a number of community members of the MSMEs. Measurements and planting in rows led to 15% increase in the number of plants in, and yield and value of produce from the land.

Sustainable consumption and production through intercropping

A total of 316 community members of the 10 MSMEs have adopted intercropping of *Ocimum kilimandscharicum* plants with cowpea, bean, onion and other plants to maximize on efficiency in land use, yield and income. Table 2 shows benefits of the intercropping in cultivation of *Ocimum kilimandscharicum* and cowpea plant on a 100 square metres area of land of one of the farmers. This resulted in increase in the number of plants by 4.3 times (332%) in the area of land and value of the produce by 2.1 times (114%).

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Table 2: Comparison of number of plants, yield and produce value on a 100 square metres area of land with and without intercropping of *Ocimum kilimandscharicum* and cowpea plants.

Crop	Number of plants	Yield (Kg)	Value (Ksh)
<i>O. kilimandscharicum</i>	436	127.0	1,270
Cowpeas	1,450	14.5	1,450
Total	1,896	141.5	2,720



Community members have adopted intercropping of *Ocimum kilimandscharicum* plants with cowpea, bean, onion and other plants to maximize on efficiency in land use, yield and value of produce. Intercropping of *Ocimum kilimandscharicum* plants with onions resulted in 4.3 times (332%) increase in the number of plants grown in a given the area of land and 2.1 times (114%) in the value of the produce.

Table 3 shows benefits of intercropping *Ocimum kilimandscharicum* with onion plants on a 100 square metres area of land of one of the farmers. This resulted in increase in the number of plants in the land (96.3%) and produce value (110%);

Table 3: Comparison of number of plants, yield and produce value on a 100 square metres area of land with and without intercropping *Ocimum kilimandscharicum* and onion plants.

Crop	Number of plants	Yield (Kg)	Value (Ksh)
<i>O. kilimandscharicum</i>	436	127	1,270
Onions	420	28	1,400
Total	850	407	2,670

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Over 316 Community members have adopted intercropping of *Ocimum kilimandscharicum* plants with cowpea, bean, onion and other plants to maximize on efficiency in land use, yield and value of produce.

Sustainable consumption and production through mulching

A total of 33 community members of the 10 MSMEs have adopted the practice of mulching in their farms. They use waste materials including waste banana and maize stems and leaves, and grass. They have appreciated the fact that mulch contributes to conservation of moisture in the soil and for keeping roots cool and weed free. In addition, it enhances the activity of soil organisms such as earthworms and it increases the content of organic matter in the soil and prevented soil erosion.



Community members have adopted the practice of mulching in their farms using waste materials including waste banana and maize stems and leaves, and grass.

Sustainable consumption and production through use of secateurs

A total of 316 community members of the 10 MSMEs adopted the use of secateurs that was promoted by the project for harvesting of *Ocimum kilimandscharicum* plants. More than 50 community members of the MSMEs who harvested *Ocimum kilimandscharicum* plants on their plots used secateurs for cutting stems of *Ocimum kilimandscharicum* medicinal plants during harvest instead of the previous use of machetes.

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Machetes damage the stem, leading to loss in plant regeneration of more than 70%. More than 90% of plants regenerate when secateurs are used.



Community members have been trained to use secateurs (*left*) instead of a machete (*right*) for cutting the stems of the medicinal plants during harvesting.



In one of the community member's farm, 96% of the stems of plants that were harvested using the secateurs sprouted successfully (*left*). Only 25 % of the plants that were harvested using a machete had sprouted, while more than 70% dried (*right*).

Sustainable consumption and production through waste recycling

A total of 38 community members from 4 MSMEs implemented SCP practices promoted by the project involving recycling of waste from processed medicinal plant material at their facility at Isecheno village. They continued to use the waste material as organic manure. During the period, over 2750 kg of waste material was used by community members as organic manure.

The community members also adopted the integration of harvested banana waste for crop residue management. This included the use of waste banana stems for construction of seedbeds instead of the more expensive and environmentally destructive use of timber and bricks, mulching using cut pieces and banana leaves for covering and mulching seedbeds.

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The project has trained and mobilized the Muliru Enterprise and community members to enhance their activities in recycling of waste from processed medicinal plant material from their facility at Isecheno village through usage as manure (*Left and bottom*).



Use of waste banana stems for construction of seedbeds instead of the more expensive and environmentally destructive use of timber and bricks.

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Sustainable consumption and production through water harvesting

A total of 38 community members of 4 out of the 10 MSMEs have adopted water harvesting practice by investing in installation of water gutters on roofs of their houses and acquisition of water tanks. This has resulted in reduction in time for collecting water from the river, particularly for women and children. School children usually carry water in one 10 liter jerry can per trip, which takes 30 minutes to more than 1 hour. Daily average consumption of water in a household is approximately 100 liters which would translate to more than 10 trips per day for a child.



A total of 38 community members of 4 out of the 10 MSMEs have adopted water harvesting practice by investing in installation of water gutters on roofs of their houses and acquisition of water tanks

Sustainable consumption of natural resources and preservation of the environment

The project undertakes activities to promote sustainable consumption of natural resources and preservation of the environment among the MSMEs and community members as a means to ensuring sustainable livelihoods. Since the beginning of the project, over 4,000 beneficiary community members of the MSMEs and other local community members have been sensitized and mobilised to undertake conservation activities adjacent to Kakamega forest including: environmental monitoring; community-based propagation of pollinator plant species; on-farm tree planting; and sensitization of other community members. The community members of the 10 MSMEs have enhanced their participation and engaged school children in the on-going forest conservation activities around Kakamega forest.

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Sustainable consumption and production of energy

The Muliru Enterprise, one of the 10 community enterprises, was facilitated to improve and optimize on sustainable energy consumption and production at their processing facility towards promotion of improved SCP practices. The enterprise uses a hydro-distillation processing equipment that requires heat energy to heat the *Ocimum kilimandscharicum* plant material immersed in water for extraction of essential oils, where liquefied petroleum gas (LPG) is used for heating. The MSME installed a solar water heating system which is now being used to preheat the water for the hydro-distillation process. This has led to 50% reduction in the use of LPG and reduction in costs of production by 31.5%.



A solar water heating system (*left*) for pre-heating water for use in processing plant material into essential oil using a hydro-distillation equipment (*bottom*) at the processing facility of the Muliru Enterprise at Isecheno, adjacent to Kakamega forest.



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The project trains and mobilizes community members of MSMEs to sensitize school children and adult community members in biodiversity conservation, and sustainable consumption and production (SCP) knowledge and practices. Members of MSMEs are able to pull large crowds for sensitization sessions that include audio visual shows and lectures.



Health and safety practices in production and processing

One of the MSMEs has been facilitated further in the area health and safety in their facility for processing medicinal plants. They have also adopted the use of health and safety sticker signs including: Hazard Warning Safety Signs; Prohibition Safety Signs; Mandatory Safety Signs; and Safe Condition Safety Signs. A range of 27 different types of health and safety sticker signs have been produced and placed at appropriate positions in their processing facility at Isecheno village adjacent in Kakamega County.

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