



CEDRIG  
Operational

## Horti-sempre: Increasing the income of smallholders through horticulture in the Nacala Corridor

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CEDRIG is a tool developed and offered by



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Agency for Development  
and Cooperation SDC

## Overview

### General Information

|                     |   |
|---------------------|---|
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| <b>Overall goal</b> | Horti-sempre, Phase 2 overall objective is to increase the annual net income of 25,000 smallholders by 30% against baseline by supporting the growth of the horticultural sector in Northern Mozambique in view of its proven importance as income creator. |
| <b>Country</b>      | Mozambique  |
| <b>Budget</b>       | 6,500,000 CHF   |
| <b>Duration</b>     | 01/2017 - 12/2020   |

### Summary

|                    |   |
|--------------------|---|
| <b>Description</b> | <p>The overall objective of the Horti-Sempre Phase 2 Project is to increase smallholder's annual net income by 30% against baseline by supporting the growth of the horticultural sector in Northern Mozambique in view of its proven importance as income creator. To fulfil its mission and reach the overall objective, Swisscontact proposes for Horti-sempre Phase 2 a logic of intervention based on three main Outcomes that unfold around three main project components namely (1) inputs and practices, (2) irrigation and (3) sector competitiveness. OUTCOME No 1: Productivity of horticultural smallholders in the Nacala Corridor in Northern Mozambique increased. OUTCOME No 2: Horticultural smallholders in the Nacala Corridor in Northern Mozambique increased their area under irrigation. OUTCOME No 3: Market responsiveness and competitiveness of the horti-cultural sector in Northern Mozambique is increased. The three components will be complemented with two transversal topics: Women's Economic Empowerment (WEE) throughout the different interventions and through special women targeted interventions and access to existing funding options. Based on experience from Phase 1, Swisscontact estimates that Horti-Sempre Phase 2 has the potential to reach 10'000 semi-commercial and 15'000 subsistence male and female smallholders in Northern Mozambique increasing their income by up to 30%.</p> |
|--------------------|---|

### Sectors of Intervention

Agriculture  
Rural development

Food security  
Water management

## Documents

MER\_Climate Change Profile (pdf, 1.2 MB)

FANRPAN\_Fact Sheet Moz (pdf, 219.89 KB)

WORLD BANK\_Climate Change Profile Moz (pdf, 2.61 MB)

Presentation\_Climate Data\_Moz (pdf, 1.01 MB)

## Images



Training on affordable irrigation solution (hip-pump)

Training on affordable irrigation solution (hip-pump)



Affordable irrigation solution (hip-pump)

Affordable irrigation solution (hip-pump)



Construction of underground dam

Construction of underground dam



Underground dam (capacity to capture 10,000m3 water)

Underground dam (capacity to capture 10,000m3 water)



Improved lettuce variety Veneranda from Brazil under protected cultivation (mini-tunnel) with drip-irrigation system

Improved lettuce variety Veneranda from Brazil under protected cultivation (mini-tunnel) with drip-irrigation system



Improved onion vareity IPA 11 from Brazil adapted to tropical climate wtih longer shelf-life

Improved onion vareity IPA 11 from Brazil adapted to tropical climate wtih longer shelf-life



Training on good agricultural practices (tomato staking)

Training on good agricultural practices (tomato staking)

## ○ Risk perspective

### Hazards arising from environmental degradation

Hazard name **Degradation (land, soil, ecosystems, biodiversity)**

Consequence **Key consequences are lower yields due to degraded soil and higher need of farmers to use inputs (fertilizers); land conflicts possible**

|                           |          |            |              |
|---------------------------|----------|------------|--------------|
| <b>&gt; Selected Risk</b> | Severity | Likelihood | Significance |
|                           | Harmful  | Likely     | Medium risk  |

Vulnerabilities Natural vulnerabilities due to overexploitation, soil compactation and erosion

Potential Measure **Good Agricultural Practices (GAPs): e.g. no tillage, soil coverage, inter-cropping**  
 Score (optional) 9.00  
 Comments Affordable and easy to apply but depends on farmers' willingness to adopt.  
**> Selected Measure**

Potential Measure **Bio-fertilization with adoption of crops fixing nitrogen in the soil (e.g. beans)**  
 Score (optional) 7.00  
 Comments Low investment, but change in farmers' traditional production pattern needed.  
**> Selected Measure**

Potential Measure **Improving irrigation with calenders to avoid over-irrigation of soils (salinization)**  
 Score (optional) 8.00  
 Comments Highly depending on farmers' willingness to change habits (training needed).  
**> Selected Measure**

Potential Measure **Mediation in land conflicts; supporting farmers in acquiring formal land rights**  
 Score (optional) 5.00  
 Comments High policy investment needed, not part of project strategy.

Potential Measure **Soil reclamation technologies (de-salinization, etc.)**  
 Score (optional) 5.00  
 Comments Very expensive based on sophisticated technologies beyond project possibilities.

Hazard name **Pests and epidemics**

**Consequence** **Key consequences are crop losses (sometimes failure) and that farmers avoid production in warmer and wetter months of the year**

|                           |                 |                   |                     |
|---------------------------|-----------------|-------------------|---------------------|
| <b>&gt; Selected Risk</b> | <b>Severity</b> | <b>Likelihood</b> | <b>Significance</b> |
|                           | Harmful         | Likely            | Medium risk         |

**Vulnerabilities** Combined physical and financial vulnerability due to lack of availability and access to equipment and production tools; human vulnerability due to limited know-how on how to deal with pest and epidemics

Potential Measure

**Crop rotation (i.e. different horticulture crops annually or by cycle)**

Score (optional) 8.00

Comments Pests accumulate over cycles and farmers need to change to crop families not prone to the same pests to break the cycle of pests. Change in traditional production pattern needed, but with little investment required.

**> Selected Measure**

Potential Measure

**Developing manual on proper use of defensives**

Score (optional) 7.00

Comments Distribution of manual to farmers is key to promote correct use of defensives.

**> Selected Measure**

Potential Measure

**Development of knowledge on bio-defensives**

Score (optional) 8.00

Comments Aiming at recovering knowledge on traditional bio-defensives abandoned over the last generations (e.g. moringa, tobacco leaves, etc.).

**> Selected Measure**

Potential Measure

**Good Agricultural Practices (GAPs) to reduce risks of diseases (spacing, tomato staking, etc.)**

Score (optional) 6.00

Comments Affordable and easy to apply but depends on farmers' willingness to adopt.

**> Selected Measure**

Potential Measure

**Directly supporting input suppliers in increasing range and sales of chemical defensives**

Score (optional) 5.00

Comments Demand by farmers has no critical mass to justify increased supply and diversification on wholesale and retail level. Furthermore, the project does not actively address potential negative impacts of increased pesticide use.

## Potential Measure

**Introducing bio-predators to eliminate bugs, etc. (e.g. wasp)**

Score (optional) 5.00

**Comments** Requires high technology and research investments, not common in Mozambique - potentially low adoption.

## Natural hazards (hydro-meteorological and geological)

Hazard name **Heat waves**

**Consequence** **Key consequences include a shortening of the growing season, crop failure (no yield) or crop losses (lower yields) due to burning of plants**

**> Selected Risk**

Severity

Likelihood

Significance

Harmful

Very likely

High risk

**Vulnerabilities**

Hardware bottlenecks: Physical vulnerabilities due to lack of agricultural equipment (irrigation schemes, protected cultivation, e.g. greenhouses) linked to financial vulnerability as no capacity to invest in adequate equipment; Software bottlenecks: human vulnerability due to lack of knowledge on available, affordable solutions such as heat tolerant seeds.

## Potential Measure

**Introduction of heat resistant and short-cycle Open Pollinated Varieties (OPV)**

Score (optional) 10.00

**Comments** Low investment needed (only 3% of estimated total cost of production) and costs not higher than of seeds currently in use

**> Selected Measure**

## Potential Measure

**Basic Climate Smart Agriculture (CSA) practices such as soil coverage to reduce evaporation**

Score (optional) 10.00

**Comments** Easy to adopt, as no investment needed, only increase in labour; depending on farmers willingness to adopt

**> Selected Measure**

## Potential Measure

**Affordable water transportation/ distribution (e.g. manual pumps) and harvesting solutions (e.g. underground dams)**

Score (optional) 6.00

**Comments** Medium to high investment required; amortisation required for investment replacement (E.g. of pumps) - economically viable but maybe not financially.

**> Selected Measure**

|                   |   |
|-------------------|---|
| Potential Measure | <p><b>Packaging and storage solutions to reduce post-harvest loss</b></p> <p>Score (optional) 5.00</p> <p>Comments Needs engagement of several players (farmers, retailers, traders, etc.). Added value justifies investment, but behaviour change needed at all levels.</p> <p>&gt; <b>Selected Measure</b></p>                              |
| Potential Measure | <p><b>Protected cultivation (mini-tunnels, greenhouses with sombrite)</b></p> <p>Score (optional) 7.00</p> <p>Comments High investment, although ROI will justify. Need for access to investment capital. Importance of building storm-proof infrastructure (e.g. concrete footings for greenhouses).</p> <p>&gt; <b>Selected Measure</b></p> |
| Potential Measure | <p><b>Introducing heat tolerant hybrid seeds</b></p> <p>Score (optional) 5.00</p> <p>Comments Seeds are expensive and only responsive/perform well under best practices and high-input agriculture.</p>   |
| Potential Measure | <p><b>Sophisticated irrigation systems (e.g. sprinkler systems, drip irrigation, etc.)</b></p> <p>Score (optional) 5.00</p> <p>Comments Are expensive and only solve water distribution problems, but not water availability.</p>   |

## Hazard name Flash floods, floods

**Consequence** Destruction of basic infrastructure and crops in early stage of growth, destruction of trade infrastructure (e.g. bridges and roads)

| > <b>Selected Risk</b> | Severity          | Likelihood | Significance |
|------------------------|-------------------|------------|--------------|
|                        | Extremely harmful | Likely     | High risk    |

**Vulnerabilities** Physical vulnerability due to poor protective infrastructure (e.g. dams); financial vulnerability due to limited cash for re-purchasing seeds, equipment and additional labour for re-sowing and land preparation

|                   |  |
|-------------------|--|
| Potential Measure | <p><b>Construction of flood-proof underground dams</b></p> <p>Score (optional) 9.00</p> <p>Comments Relatively low investment based on community labour; little maintenance needed; long-lasting infrastructure not affected by floods compared to traditional dams.</p> <p>&gt; <b>Selected Measure</b></p> |
|-------------------|--|



|                   |   |
|-------------------|---|
| Potential Measure | <p><b>Short-cycle open pollinated varieties (OPV; e.g. 60 dias cabbage)</b></p> <p>Score (optional) 10.00</p> <p>Comments Give farmers the flexibility to recover their production cycle quickly after the loss of a cycle.</p> <p>&gt; <b>Selected Measure</b></p>   |
| Potential Measure | <p><b>Storage infrastructure</b></p> <p>Score (optional) 7.00</p> <p>Comments Minimize risks, but do not completely eliminate the risk of flooding that can take away the building. Not always viable depending on location and costs.</p>  |
| Potential Measure | <p><b>Recommending relocation to less risky areas</b></p> <p>Score (optional) 5.00</p> <p>Comments Depends on topography, normally farms only spread across low areas close to rivers due to lack of water transportation systems. Relocation implies costs and reduced access to water.</p>  |
| Potential Measure | <p><b>Early warning system</b></p> <p>Score (optional) 7.00</p> <p>Comments Depends on public institutions and investments beyond project scope.</p>  |
| Potential Measure | <p><b>Financial safety nets to recover lost investments after floods (e.g. seeds, infrastructure, etc.)</b></p> <p>Score (optional) 8.00</p> <p>Comments Savings and lending groups are already widespread as coping and risk transfer mechanisms in Northern Mozambique (called Xitique). Other funding mechanisms (e.g. loans from micro-finance institutions) focus on economic activities with a fast turnover such as small trading, and not on agricultural production.</p> |

## Hazards arising from climate change (and climate variability)

Hazard name **Shifts in season**

**Consequence** It is difficult for farmers to predict the start of the rainy season. Due to a delayed start of the rainy season, the growing cycle is postponed into the hot season when it is difficult to produce horticulture. Higher risk of pests due to humidity.

> **Selected Risk**

| Severity | Likelihood  | Significance |
|----------|-------------|--------------|
| Harmful  | Very likely | High risk    |

**Vulnerabilities** Combined physical and financial vulnerability due to lack of availability and access to equipment and production tools; human vulnerability due to limited know-how on coping strategies to deal with erratic rainfall patterns

|                   |  |
|-------------------|--|
| Potential Measure | <p><b>More rustic, short cycle and tropicalized varieties to produce in hot season</b></p> <p>Score (optional) 10.00</p> <p>Comments Low investment needed (only 3% of estimated total cost of production) and costs not higher than of seeds currently in use.</p> <p>&gt; <b>Selected Measure</b></p>                              |
| Potential Measure | <p><b>Affordable irrigation solutions (manual pumps, santeno, underground dams, etc.)</b></p> <p>Score (optional) 6.00</p> <p>Comments Medium to high investment required; amortisation required for investment replacement (E.g. of pumps) - economically viable but maybe not financially.</p> <p>&gt; <b>Selected Measure</b></p> |
| Potential Measure | <p><b>Diversification with shorter-cycle crops or varieties (e.g. cabbage, lettuce, etc.)</b></p> <p>Score (optional) 8.00</p> <p>Comments High impact with switching to other crops but need to convince farmers about new pattern of production (behaviour change).</p> <p>&gt; <b>Selected Measure</b></p>                        |
| Potential Measure | <p><b>Protected cultivation (tunnels and mini-tunnels)</b></p> <p>Score (optional) 7.00</p> <p>Comments High investment, although ROI will justify. Need for access to investment capital.</p> <p>&gt; <b>Selected Measure</b></p>   |
| Potential Measure | <p><b>Hydroponic production</b></p> <p>Score (optional) 7.00</p> <p>Comments Medium/high investment and need of intensive training on hydroponic production (limited outreach).</p> <p>&gt; <b>Selected Measure</b></p>  |
| Potential Measure | <p><b>Good agricultural practices (GAPs): e.g. high beds, mulching, spacing, tomato staking, disease control</b></p> <p>Score (optional) 8.00</p> <p>Comments Affordable and easy to apply but depends on farmers willingness to adopt.</p> <p>&gt; <b>Selected Measure</b></p>  |

Potential Measure

**Production calendars for scaling of production**

Score (optional) 8.00

Comments Effective, but depends on farmers behaviour change.

[> Selected Measure](#)

Potential Measure

**Large-scale irrigation schemes / infrastructure that provides holistic irrigation solutions (water harvesting, capture, transportation and distribution)**

Score (optional) 6.00

Comments Expensive investment out of scope of the project.

## Adapt your project

[Impact Logic \(pdf, 651.13 KB\)](#)

[Logframe\\_HS\\_Phase2 \(pdf, 201.84 KB\)](#)

[CEDRIG\\_Score \(xlsx, 12.69 KB\)](#)

## Impact perspective

### Impact on the environment

#### Component of the project

#### Underground dams

**Potential negative impact** Small-scale rainwater retention to increase soil humidity might potentially change the ecosystem; limited additional pollution due to the plastic used to build the dam

**Significance** Low. Underground dams are small-scale infrastructure with catchment areas of only approximately 0.8ha and neglectable amount of plastic used in construction.

#### Component of the project

#### Inputs (fertilizer & pesticides)

**Potential negative impact** Use of fertilizer and pesticides by horticulture smallholders is common, and sometimes not correctly applied with negative impact on the soil (over-fertilizing)

**Significance** Medium. Amount of fertilizers and pesticides used is very limited due to low capacity of investment, thus limited impact on soil.

#### > Selected impact

#### Potential Measure

#### Dissemination of information on correct use of fertilizers and pesticides (amount and frequency)

Score (optional) 8.00

**Comments** The project follows a market-approach that does not control and/or increase directly the quantity of fertilizers and pesticides used by smallholders. However, information on correct use of fertilizer and pesticides is disseminated during crop days to protect soil and eventually smallholders' production.

#### > Selected Measure

#### Component of the project

#### Introduction of tropicalized varieties from Brazil

**Potential negative impact** Introducing new horticultural crop varieties has the potential to seriously affect the biological balance in the country by introducing exotic diseases and harming local biodiversity.

**Significance** High. Through accidentally importing vegetables and/or seeds that carry exotic pests or diseases, the agro-biodiversity can be seriously affected with strong impacts on the agricultural and forestry sector.

#### > Selected impact

## Potential Measure

**Phytosanitary testing and certification of all new varieties before import with public agricultural research institute (IIAM)**

Score (optional) 8.00

**Comments** To avoid any potential impact on the environment by importing exotic pests and diseases, each new variety undergoes a rigorous phytosanitary testing process at IIAM research station before an import permit is issued.

**> Selected Measure**

## Impact on climate change

## Component of the project

## Increasing volumes and de-seasonalization of horticulture production

## Potential negative impact

Possibly increasing emissions of Greenhouse Gases (GHG) due to increased local horticultural production and related transport volumes.

## Significance

Low. Current international and interregional imports might decrease due to a higher availability of locally produced vegetables, which offsets the increased local traffic in the Nacala Corridor.