

# (Cambodia)

# DESCRIPTION

рΗ (TSTD, 2012)



Location:

, Cambodia

No. of Technology sites analysed: 10-100

Geo-reference of selected sites
• 103.79317, 12.54991

**Spread of the Technology:** evenly spread over

In a permanently protected area?:

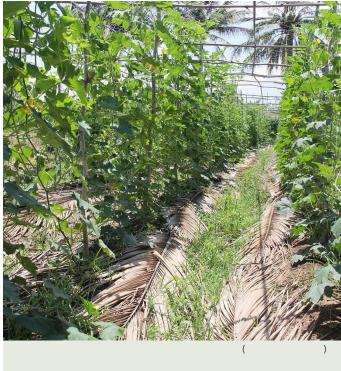
Date of implementation: 2013

# Type of introduction

- through land users' innovation
- as part of a traditional system (> 50 years)

during experiments/ research
through projects/ external interventions





# CLASSIFICATION OF THE TECHNOLOGY

#### Main purpose

- improve production
  - reduce, prevent, restore land degradation
- conserve ecosystem
- protect a watershed/ downstream areas in combination with other Technologies
- preserve/ improve biodiversity
- reduce risk of disasters
- adapt to climate change/ extremes and its impacts
  - mitigate climate change and its impacts
- create beneficial economic impact
  - create beneficial social impact

#### Land use



#### Cropland

Annual cropping: vegetables - melon, pumpkin, squash or gourd

Number of growing seasons per year: 3

# Water supply

- rainfed
- mixed rainfed-irrigated
- full irrigation

#### Purpose related to land degradation

- prevent land degradation
- reduce land degradation
- restore/ rehabilitate severely degraded land
- adapt to land degradation
- not applicable

# Degradation addressed



soil erosion by water - Wt: loss of topsoil/ surface erosion



**chemical soil deterioration** - Cn: fertility decline and reduced organic matter content (not caused by erosion)



biological degradation - BI: loss of soil life



water degradation - Ha: aridification

# SLM group

- improved ground/ vegetation cover
- ground water management

# SLM measures

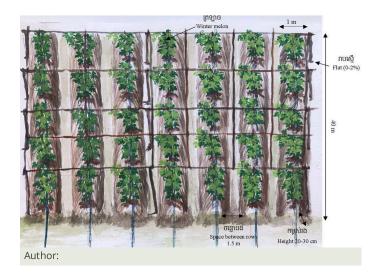


agronomic measures - A2: Organic matter/ soil fertility

# TECHNICAL DRAWING

Technical specifications

( - %)



3/7

Most important factors affecting the costs

# ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

# Calculation of inputs and costs

• Costs are calculated: per Technology area (size and area unit:

; conversion factor to one hectare: **1 ha** =

- Currency used for cost calculation:
- Exchange rate (to USD): 1 USD = 4000.0
- Average wage cost of hired labour per day:

#### Establishment activities

(Timing/ frequency: 1. ) 2. (Timing/ frequency: 3. (Timing/ frequency: . (Timing/ frequency: 4. ) 5. (Timing/ frequency: (Timing/ frequency: 6. (Timing/ frequency: 7.

Establishment inputs and costs (per

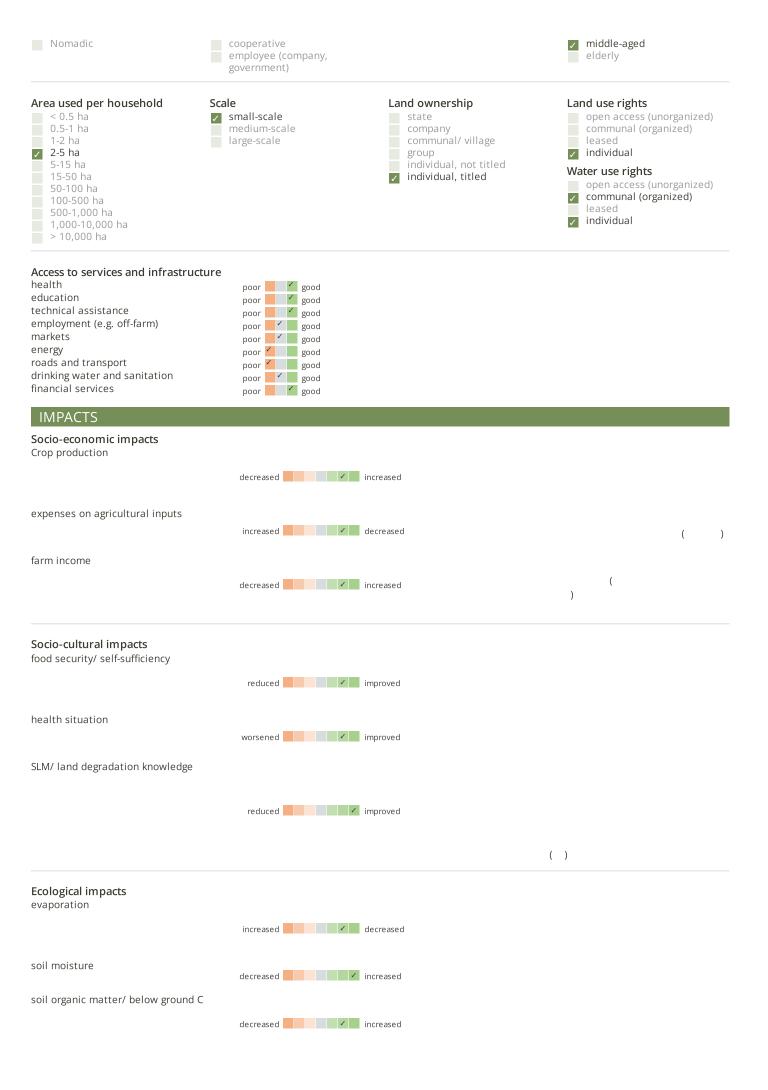
| Specify input  | Unit     | Quantity | Costs per Unit | Total costs<br>per input<br>( ) | % of costs<br>borne by land<br>users |
|--|----------|----------|----------------|---------------------------------|--------------------------------------|
| Labour   |          | •        | •              |                                 | •                                    |
|  |          | 1.0      | 25000.0        | 25000.0                         | 100.0                                |
|  |          | 5.0      | 30000.0        | 150000.0                        | 100.0                                |
|  |          | 2.0      | 25000.0        | 50000.0                         | 100.0                                |
|  |          | 2.5      | 27500.0        | 68750.0                         | 100.0                                |
| quipment   |          |          |                |                                 |                                      |
|  |          | 2.0      | 7000.0         | 14000.0                         | 100.0                                |
|  |          | 5.0      | 2500.0         | 12500.0                         | 100.0                                |
|  |          | 1.0      | 12000.0        | 12000.0                         | 100.0                                |
|  |          | 1.0      | 12000.0        | 12000.0                         | 100.0                                |
|  |          | 2.0      | 25000.0        | 50000.0                         | 100.0                                |
|  |          | 3.0      | 15000.0        | 45000.0                         | 100.0                                |
| ertilizers and biocides                                | <u>.</u> |          |                |                                 |                                      |
|  |          | 2.0      | 2500.0         | 5000.0                          | 100.0                                |
| (DAP)  |          | 2.0      | 25000.0        | 50000.0                         | 100.0                                |
|  |          | 50.0     | 2400.0         | 120000.0                        | 100.0                                |
|  |          | 50.0     | 1800.0         | 90000.0                         | 100.0                                |
|  |          | 1.0      | 25000.0        | 25000.0                         | 100.0                                |
| Construction material                                  | <u>.</u> |          |                |                                 |                                      |
|  |          | 5.0      | 47000.0        | 235000.0                        | 100.0                                |
|  |          | 2.5      | 90000.0        | 225000.0                        | 100.0                                |
|  |          | 1.0      | 20000.0        | 20000.0                         | 100.0                                |
| Other  |          |          |                |                                 | -                                    |
|  |          | 2.0      | 25000.0        | 50000.0                         | 100.0                                |
| Total costs for establishment of the Technology        |          |          |                | 1'259'250.0                     |                                      |
| Total costs for establishment of the Technology in USD |          |          |                |                                 |                                      |

Maintenance activities

1. (Timing/ frequency:

Wocat SLM Technologies

| <ul><li>2. ( ) (Timing/ frequency:</li><li>3. (Timing/ frequency: )</li></ul>   |   |   | )  |                           |  |                             |  |
|---|---|---|--|---------------------------|--|-----------------------------|--|
|   | ming/ frequency:<br>(Timing/ frequenc   | cy:                                     | )  |                           |  |                             |  |
| Maintenance inputs and costs (p<br>Specify input  | per )   | Unit                                    | Quantity   | Costs per Unit            | per input  | % of costs<br>borne by land |  |
| Labour  |   |   |  |                           | ( )  | users                       |  |
|   |   |   | 1.0  | 25000.0                   | 25000.0  | 100.0                       |  |
| Farriage and  |   |   | 1.0  | 20000.0                   | 20000.0  | 100.0                       |  |
| Equipment   |   | 1.                                      | 8.0  | 4700.0                    | 37600.0  | 100.0                       |  |
|   |   |   | 7.0  | 4700.0                    | 32900.0  | 100.0                       |  |
| <b>Total costs for maintenance of the</b> Total costs for maintenance of the T  |   |   |  |                           | 115'500.0<br>28.88   |                             |  |
|   |   |   |  |                           | 20.00  |                             |  |
| NATURAL ENVIRONMEN  Average annual rainfall  < 250 mm  251-500 mm  501-750 mm  751-1,000 mm  1,001-1,500 mm  1,501-2,000 mm  2,001-3,000 mm  3,001-4,000 mm  > 4,000 mm | Agro-climatic zone humid sub-humid semi-arid arid                                       | Í                                       | ne of the meteor   | on:                       |  |                             |  |
| Filope  ✓ flat (0-2%) gentle (3-5%) moderate (6-10%) rolling (11-15%) hilly (16-30%) steep (31-60%) very steep (>60%)   | Landforms  plateau/plains ridges mountain slopes hill slopes footslopes valley floors   | 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | nde<br>-100 m a.s.l.<br>01-500 m a.s.l.<br>01-1,000 m a.s.l.<br>,001-1,500 m a.s.<br>,501-2,000 m a.s.<br>,501-3,000 m a.s.<br>,001-4,000 m a.s. | .l.<br>.l.<br>.l.         | Technology is applied in  convex situations concave situations  not relevant |                             |  |
| very shallow (0-20 cm) shallow (21-50 cm) moderately deep (51-80 cm) deep (81-120 cm) very deep (> 120 cm)  | Soil texture (topsoil)  coarse/ light (sandy) medium (loamy, silty) fine/ heavy (clay)  | surfa<br>Co<br>V m                      | Soil texture (> 20 cm below surface)  coarse/ light (sandy)  medium (loamy, silty)  fine/ heavy (clay)   |                           | Topsoil organic matter conter  ✓ high (>3%)  medium (1-3%)  low (<1%)        |                             |  |
| Groundwater table on surface ✓ < 5 m 5-50 m > 50 m  | Availability of surface was excess good medium poor/ none                               | g<br>p<br>(t<br>v fo                    | r quality (untre<br>ood drinking wat<br>oor drinking wate<br>reatment require<br>or agricultural us<br>rrigation)                                | er<br>er<br>ed)<br>e only | Is salinity a problem?  Ja Nee  Occurrence of flooding                       |                             |  |
| Species diversity  high medium low  | Habitat diversity  high medium low  | unusable<br>Water quality refers to:    |  | o:                        | √ Nee  |                             |  |
| CHARACTERISTICS OF LA   | AND USERS APPLYING  | THE TECH                                | NOLOGY _   |                           |  |                             |  |
| Market orientation  subsistence (self-supply) mixed (subsistence/ commercial) commercial/ market  | Off-farm income  less than 10% of all income  10-50% of all income  > 50% of all income | come vo                                 | ive level of wea<br>ery poor<br>oor<br>verage<br>ch<br>ery rich  | lth                       | Level of mechanization  manual work animal traction mechanized/ motorized    |                             |  |
| Sedentary or nomadic Sedentary Semi-nomadic   | Individuals or groups individual/ household groups/ community                           |   | ler<br>romen<br>nen  |                           | Age children youth   |                             |  |



#### Off-site impacts

# COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns very negative very positive Long-term returns very negative very positive

Benefits compared with maintenance costs

Short-term returns very negative very positive Long-term returns very negative very positive

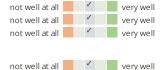
# **CLIMATE CHANGE**

# Gradual climate change

annual temperature increase seasonal temperature increase annual rainfall increase

Climate-related extremes (disasters)

local rainstorm flash flood



not well at all very well

(

Season: summer

# ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

single cases/ experimental 1-10%

**11-50%** > 50%

Number of households and/ or area covered

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

)

0-10% 11-50% 51-90% 91-100%

Has the Technology been modified recently to adapt to changing conditions?

la ✓ Nee

### To which changing conditions?

climatic change/ extremes

changing markets

labour availability (e.g. due to migration)

# CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

Strengths: compiler's or other key resource person's view

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome

#### REFERENCES

Compiler Sok Pheak **Editors** Sophea Tim Navin Chea

Reviewer Nicole Harari SO Than Stephanie Jaquet Ursula Gaemperli Alexandra Gavilano

Last update: Maart 1, 2019

Date of documentation: Aug. 23, 2017

Resource persons

- land user

Full description in the WOCAT database

https://qcat.wocat.net/af/wocat/technologies/view/technologies\_3152/

Linked SLM data

n.a.

#### Documentation was faciliated by

Institution

- Royal University of Agriculture (RUA) Cambodia Project
- Scaling-up SLM practices by smallholder farmers (IFAD)

# Key references

• Lalljee, B., 2013. Mulching as a mitigation agricultural technology against land degradation in the wake of climate change. International Soil and Water Conservation Research, 1(3), pp. 68-74.:

# Links to relevant information which is available online

• Agricultural Technique Manual of Tonle Sap Poverty Reduction and Smallholder Development Project: http://www.tssdcambodia.org/

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