(Raúl Galeas)

Protección de fuentes de agua en la comunidad de Llimpes (Ecuador)

Comunidad Llimpes, Parroquia La Matriz, Cantón Quero, Provincia de Tungurahua

DESCRIPTION

LOCATION

Location: Cantón Tisaleo, Comunidad de Santa Lucía Arriba Cantón Quero y Pelileo. Comunidad Puñachizag, Tungurahua, Ecuador

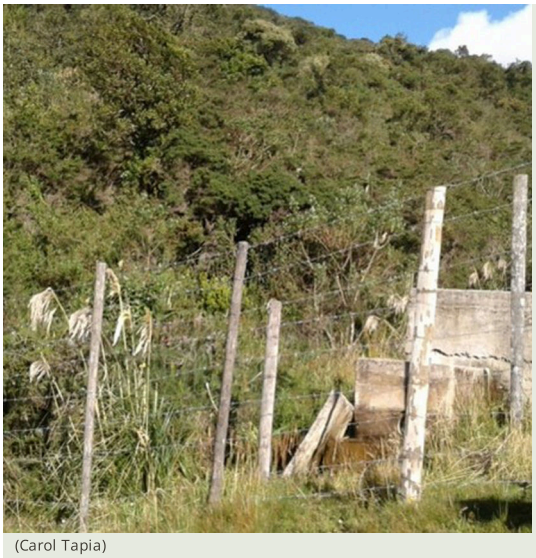
No. of Technology sites analysed: 2-10 sites

Geo-reference of selected sites
- -78.68099, -1.34498
- -78.56936, -1.37741

Spread of the Technology: evenly spread over an area (approx. 0.1-1 km2)

Date of implementation: less than 10 years ago (recently)

Type of introduction
- [x] through land users' innovation
- [ ] as part of a traditional system (> 50 years)
- [ ] during experiments/ research
- [x] through projects/ external interventions



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CLASSIFICATION OF THE TECHNOLOGY

Main purpose

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

Land use

Forest/ woodlands - Tree plantation, afforestation: Monoculture exotic variety
Products and services: Timber, Nature conservation/ protection

Mixed (crops/ grazing/ trees), incl. agroforestry - Agro-pastoralism

Water supply

- [ ] rainfed
- [x] mixed rainfed-irrigated
- [ ] full irrigation

Number of growing seasons per year: 2
Land use before implementation of the Technology: n.a.
Livestock density: n.a.

Purpose related to land degradation

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

Degradation addressed

physical soil deterioration - Pc: compaction, Pu: loss of bio-productive function due to other activities

biological degradation - Bc: reduction of vegetation cover, Bq: quantity/ biomass decline, Bl: loss of soil life

water degradation - Ha: aridification, Hs: change in quantity of surface water, Hg: change in groundwater/aquifer level, Hp: decline of surface water quality, Hq: decline of groundwater quality, Hw: reduction of the buffering capacity of wetland areas

SLM group

- area closure (stop use, support restoration)
- improved ground/ vegetation cover
- surface water management (spring, river, lakes, sea)

SLM measures

vegetative measures - V1: Tree and shrub cover

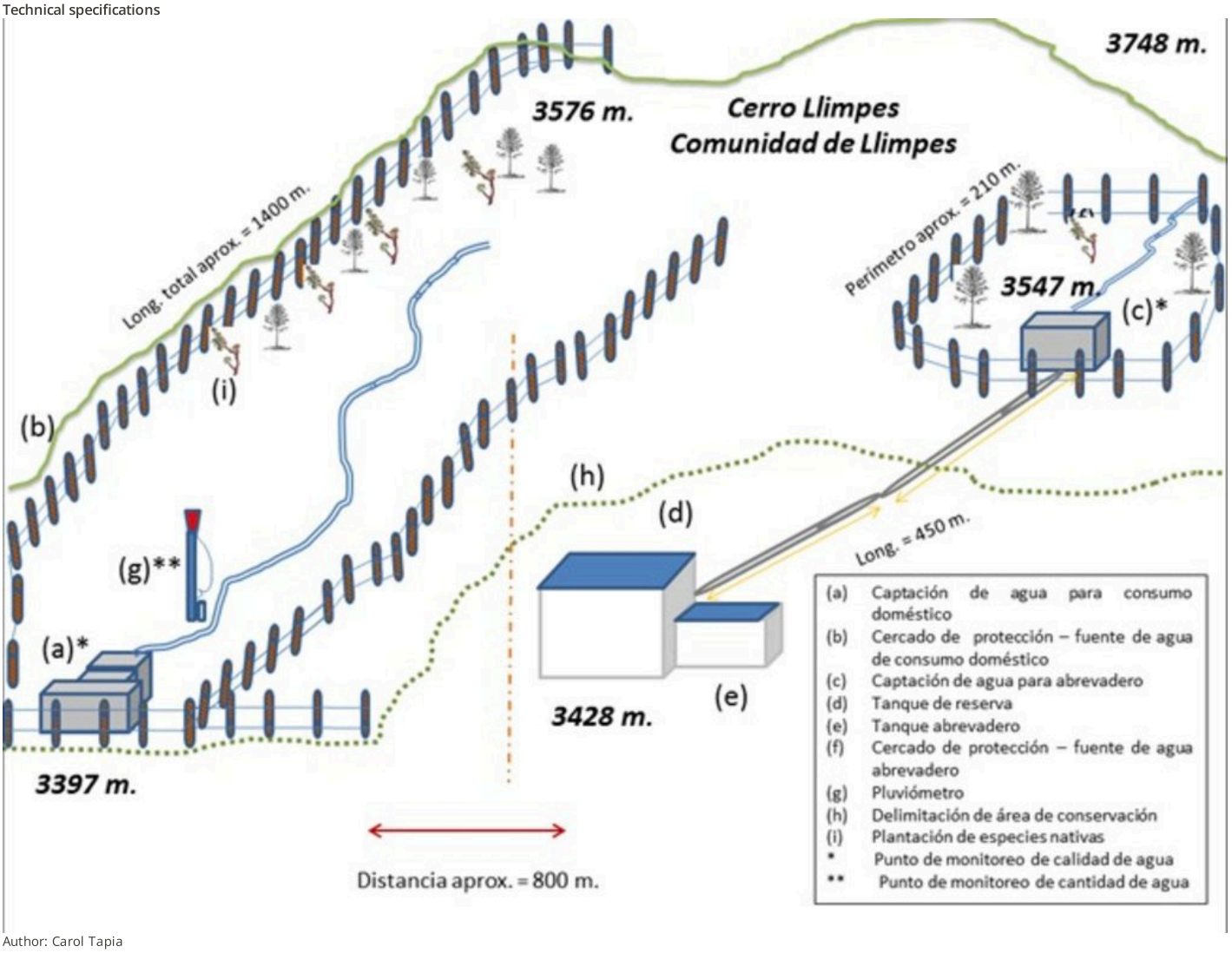
structural measures - S7: Water harvesting/ supply/ irrigation equipment

management measures - M1: Change of land use type

other measures -

TECHNICAL DRAWING

Technical specifications



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ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs
- Costs are calculated: per Technology unit
- Currency used for cost calculation: **US Dollars**
- Exchange rate (to USD): 1 USD = n.a
- Average wage cost of hired labour per day: 10-20

Most important factors affecting the costs
n.a.

Establishment activities
1. (Timing/ frequency: None)
2. (Timing/ frequency: None)
3. (Timing/ frequency: None)
4. (Timing/ frequency: None)
5. (Timing/ frequency: None)

Establishment inputs and costs

Specify input	Unit	Quantity	Costs per Unit (US Dollars)	Total costs per input (US Dollars)	% of costs borne by land users
Labour					
	1	1.0	200.0	200.0	100.0
	1	1.0	3092.25	3092.25	100.0
	1	1.0	75.0	75.0	100.0
	1	1.0	500.0	500.0	100.0
Plant material					
	1	1.0	207.29	207.29	
Construction material					
	1	1.0	942.6	942.6	
	1	1.0	7744.81	7744.81	
	1	1.0	4585.0	4585.0	
Total costs for establishment of the Technology				**17'346.95**	

Maintenance activities
1. (Timing/ frequency: None)
2. (Timing/ frequency: None)
3. (Timing/ frequency: None)
4. (Timing/ frequency: None)

Maintenance inputs and costs

Specify input	Unit	Quantity	Costs per Unit (US Dollars)	Total costs per input (US Dollars)	% of costs borne by land users
Labour					
		144.0	15.0	2160.0	100.0
		12.0	15.0	180.0	100.0
		12.0	15.0	180.0	100.0
		30.0	2.082	62.46	100.0
Equipment					
		12.0	63.84	766.08	100.0
		10.0	12.0	120.0	100.0
Other					
		420.0	15.0	6300.0	100.0
Total costs for maintenance of the Technology				**9'768.54**	

NATURAL ENVIRONMENT

Average annual rainfall
- [ ] < 250 mm
- [ ] 251-500 mm
- [x] 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
- [x] sub-humid
- [ ] semi-arid
- [ ] arid

Specifications on climate
Average annual rainfall in mm: 615.0

Slope
- [ ] flat (0-2%)
- [ ] gentle (3-5%)
- [ ] moderate (6-10%)
- [ ] rolling (11-15%)
- [x] hilly (16-30%)
- [x] steep (31-60%)
- [ ] very steep (>60%)

Landforms
- [ ] plateau/plains
- [ ] ridges
- [x] mountain slopes
- [x] hill slopes
- [ ] footslopes
- [ ] valley floors

Altitude
- [ ] 0-100 m a.s.l.
- [ ] 101-500 m a.s.l.
- [ ] 501-1,000 m a.s.l.
- [ ] 1,001-1,500 m a.s.l.
- [ ] 1,501-2,000 m a.s.l.
- [ ] 2,001-2,500 m a.s.l.
- [ ] 2,501-3,000 m a.s.l.
- [x] 3,001-4,000 m a.s.l.
- [ ] > 4,000 m a.s.l.

Technology is applied in
- [ ] convex situations
- [x] concave situations
- [ ] not relevant

Soil depth
- [ ] very shallow (0-20 cm)
- [ ] shallow (21-50 cm)
- [ ] moderately deep (51-80 cm)
- [x] deep (81-120 cm)
- [ ] very deep (> 120 cm)

Soil texture (topsoil)
- [x] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [x] fine/ heavy (clay)

Soil texture (> 20 cm below surface)
- [x] coarse/ light (sandy)
- [ ] medium (loamy, silty)
- [x] fine/ heavy (clay)

Topsoil organic matter content
- [x] high (>3%)
- [ ] medium (1-3%)
- [ ] low (<1%)

Groundwater table
- [x] on surface
- [ ] < 5 m
- [ ] 5-50 m
- [ ] > 50 m

Availability of surface water
- [ ] excess
- [x] good
- [ ] medium
- [ ] poor/ none

Water quality (untreated)
- [ ] good drinking water
- [x] poor drinking water (treatment required)
- [ ] for agricultural use only (irrigation)
- [ ] unusable

Is salinity a problem?
- [ ] Ja
- [x] Nee

Occurrence of flooding
- [ ] Ja
- [x] Nee

Species diversity
- [ ] high
- [x] medium
- [ ] low

Habitat diversity
- [ ] high
- [x] medium
- [ ] low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation
- [ ] subsistence (self-supply)
- [x] mixed (subsistence/ commercial
- [ ] commercial/ market

Off-farm income
- [x] less than 10% of all income
- [ ] 10-50% of all income
- [ ] > 50% of all income

Relative level of wealth
- [ ] very poor
- [x] poor
- [ ] average
- [ ] rich
- [ ] very rich

Level of mechanization
- [x] manual work
- [ ] animal traction
- [x] mechanized/ motorized

Sedentary or nomadic
- [x] Sedentary
- [ ] Semi-nomadic
- [ ] Nomadic

Individuals or groups
- [x] individual/ household
- [x] groups/ community
- [ ] cooperative
- [ ] employee (company, government)

Gender
- [x] women
- [x] men

Age
- [ ] children
- [ ] youth
- [x] middle-aged
- [ ] elderly

Area used per household
- [x] < 0.5 ha
- [ ] 0.5-1 ha
- [ ] 1-2 ha
- [ ] 2-5 ha
- [ ] 5-15 ha
- [ ] 15-50 ha
- [ ] 50-100 ha
- [ ] 100-500 ha
- [ ] 500-1,000 ha
- [ ] 1,000-10,000 ha
- [ ] > 10,000 ha

Scale
- [x] small-scale
- [ ] medium-scale
- [ ] large-scale

Land ownership
- [ ] state
- [ ] company
- [ ] communal/ village
- [ ] group
- [ ] individual, not titled
- [ ] individual, titled

Land use rights
- [ ] open access (unorganized)
- [ ] communal (organized)
- [ ] leased
- [ ] individual

Water use rights
- [ ] open access (unorganized)
- [x] communal (organized)
- [ ] leased
- [ ] individual

Access to services and infrastructure

health	poor	good
education	poor	good
technical assistance	poor	good
employment (e.g. off-farm)	poor	good
markets	poor	good
energy	poor	good
roads and transport	poor	good
drinking water and sanitation	poor	good
financial services	poor	good

IMPACTS

Socio-economic impacts

forest/ woodland quality	decreased	increased
drinking water availability	decreased	increased
drinking water quality	decreased	increased
water availability for livestock	decreased	increased
water quality for livestock	decreased	increased

Socio-cultural impacts

health situation	worsened	improved
land use/ water rights	worsened	improved
community institutions	weakened	strengthened
SLM/ land degradation knowledge	reduced	improved
conflict mitigation	worsened	improved

Ecological impacts

water quantity	decreased	increased
water quality	decreased	increased
soil moisture	decreased	increased
soil cover	reduced	improved
soil compaction	increased	reduced
vegetation cover	decreased	increased
plant diversity	decreased	increased
invasive alien species	increased	reduced
animal diversity	decreased	increased
beneficial species (predators, earthworms, pollinators)	decreased	increased
habitat diversity	decreased	increased
drought impacts	increased	decreased
emission of carbon and greenhouse gases	increased	decreased
micro-climate	worsened	improved

Off-site impacts

water availability (groundwater, springs)	decreased	increased
reliable and stable stream flows in dry season (incl. low flows)	reduced	increased

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	not well at all	very well	Answer: not known
seasonal rainfall increase	not well at all	very well	Season: wet/ rainy season

Climate-related extremes (disasters)

cold wave	not well at all	very well
drought	not well at all	very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology
- [ ] single cases/ experimental
- [ ] 1-10%

Of all those who have adopted the Technology, how many have done so without receiving material incentives?
- [ ] 0-10%

- [ ] 10-50%
- [x] more than 50%

- [ ] 10-50%
- [ ] 50-90%
- [x] 90-100%

Number of households and/ or area covered
425

Has the Technology been modified recently to adapt to changing conditions?
- [x] Ja
- [ ] Nee

To which changing conditions?
- [ ] climatic change/ extremes
- [ ] changing markets
- [ ] labour availability (e.g. due to migration)
- [x] .

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view
- None
- None
- None
- None

Strengths: compiler's or other key resource person's view
- None
- None
- None
- None
- None
- None

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome
- None
- None

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome
- None
- None
- None

REFERENCES

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Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/technologies/view/technologies_4044/

Linked SLM data
n.a.

Documentation was faciliated by

Institution
- n.a.

Project
- n.a.

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Links to relevant information which is available online
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