Bottle of Mezcal from the Titzio project (Christian Prat)

Participative actions for economic benefits of agave forestry (Mexico)

Recuperación de tierras degradadas por agaveforestería a través de acciones participativas para beneficios económicos (Spanish)

DESCRIPTION

Land reclamation with local agave (to produce Mezcal) associated with trees, shrubs and grasses planted through participative actions for economic benefit.

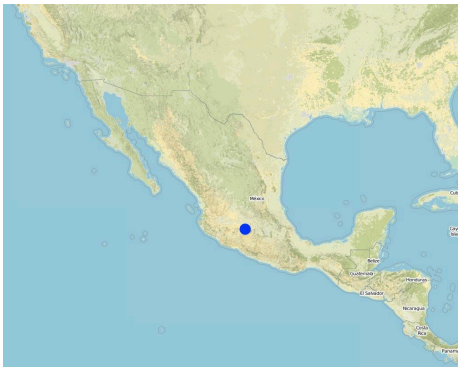
Aims / objectives: Rehabilitation of degraded land is achieved by using native agave (Agave inaequidens) and trees, shrubs and grasses which creates, over the medium-term (7-10 year), a sustainable production of an alcoholic drink (mezcal) and/or pharmaceutical products and/or fodder for cattle and/or wood. Further objectives are water conservation, biodiversity, generation of permanent employment (plant reproduction, planting, alcoholic drink/ pharmaceutical production), carbon sequestration, generation of higher family incomes and a reduction in the amount of livestock and number of animals and uncontrolled grazing (the main cause of soil erosion). These positive impacts of the approach contribute to preventing the rural population from emigrating to the cities or abroad.

Methods: Coordination, cooperation and systematic participatory process among stakeholders are the basis of the approach. Promoting participatory processes occurs through workshops, interviews with community leaders, field visits conducted with owners of the land to recognize the problems and identify areas of opportunity, training courses, exchange of experiences with other people who are developing similar projects at different stages. Technical advice and the links with scientists, technicians and public officials in charge of project beneficiaries is given under a two-way process of mutual learning and seeking to strengthen self-management capabilities that inspires innovation at the different stages. The key to success of a participatory approach lies in liberating and developing community leadership and self-organization processes.

Stages of implementation: The project is part of a regional planning context and a basin scale approach of intervention. The watershed of the site project is included in a special programme of the Ministry of Environment and Natural Resources of Mexico which gives the opportunity of developing and financing a medium- to long-term project. The participatory process is delivered from planning, organizing, programming and implementing to financing, training, monitoring and disseminating the results. The strategic perspective of the project includes capacity-building of land owners for greenhouse and nursery management, the technical assessment for the improvement of the agave forestry system, guidance with quality production of mezcal and marketing support to diversify products and sell them in order to make the project financially self-sustaining and profitable. All these stages range from short- to medium- and long-term.

Role of stakeholders: The government finances the project through grant resources, promotes the participation of beneficiaries and monitors it, seeking the management of resources and intersectoral participation. Scientists and academics share their knowledge, techniques and methodologies for implementation, improvement, evaluation and monitoring of each stage, and they support capacity-building of the community. The owners of the land and the

LOCATION



Location: Morelia, Mexico/Michoacán state, Mexico

Geo-reference of selected sites

- -101.19, 19.7

Initiation date: 2009

Year of termination: 2012

Type of Approach

- ☐ traditional/ indigenous
- ☐ recent local initiative/ innovative
- ☐ project/ programme based
- ☑ Traditional, innovative and project based

community implement and develop each of the activities from building and maintaining the greenhouse and nursery, planting agaves, trees and shrubs, to the use and production of mezcal and other commercial products.

A 7-year-old plantation of Agave cupreata ('Maguey papalote"). Titzio project, Michoacán de Ocampo state (Christian Prat)

A 1-year-old Agave inaequidens plantation on eroded soil (Acrisol) and volcanic tuff (so-called 'tepetate') in El Calabozo – Potrerillos sub-catchment of Cointzio basin, Michoacán de Ocampo state. (Eduardo Rios (eduardo.rios@semarnat.gob.mx))

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims / objectives of the approach

The Approach focused mainly on other activities than SLM (registered alcohol production, cattle fodder, medicine uses, biodiversity conservation, wood)

Rehabilitation of degraded land is done using native agave (Agave inaequidens), trees, shrubs and grasses which creates, over the medium-term (7-10 years) sustainable production of an alcoholic drink (mezcal) and/or pharmaceutical products and/or fodder for cattle and/or wood.

The SLM Approach addressed the following problems: Social and economic problems: Agriculture and livestock in the region are primarily for subsistence. The level of poverty and marginalization of the people of the project site is medium to high with low education levels. People need to migrate to the cities or outside the country to supplement the family budget. Prices of farmer productions are too low and do not allow economic survival. Therefore, only 10 to 20% of the total incomes are derived from agricultural products! This explains why the children of farmers do not want to become farmers and lands are less and less cultivated. In correlation, as the livestock price is good and animals can be raised with little input of time. Thus the number of animals is increasing and as they are grazing everywhere, they have a strong soil erosion impact.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Legal framework (land tenure, land and water use rights)**: The existing land ownership, land use rights / water rights greatly helped the approach implementation

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Social/ cultural/ religious norms and values**: The social arrangement of the "ejido" requires all people to agree on moving forward with different activities. The level of education and migration. Treatment through the SLM Approach: Systematic and constant promotion of the participatory process through community assembly meetings, workshops, community exchange travel, experiences and training. Promote complementarity and targeting of resources from other sectors.
- **Availability/ access to financial resources and services**: Potential constraints in the final stages of the project when receiving revenue from the sale of mezcal and other products. Treatment through the SLM Approach: Strengthening capacities of organization and administration, promoting transparency and accountability in the community. Development and consolidation of the formation of cooperatives as an alternative to social enterprise.
- **Institutional setting**: The risk that the six-year change in administration does not follow the care programme in the area. Treatment through the SLM Approach: Strengthening self-management capabilities of the group of beneficiaries of the project. Involving other government levels and sectors funding training and monitoring of subsequent stages.
- **Legal framework (land tenure, land and water use rights)**: Federal, state and municipal regulations for preventing clearance of woods, biodiversity uses, forest exploitation, water concessions and water quality must be applied. Mexican official standards of mezcal production must be used Treatment through the SLM Approach: Conduct a thorough review with a focus on prospective different stages of a project and the legal implications and regulations that must be met at these stages. Inform land owners about their rights, obligations and mechanisms of fulfilment.
- **Knowledge about SLM, access to technical support**: Lack of validation and technology transfer of agave forestry. Lack of information on the requirements of these species of agave. Potential risk to move from non-intensive system to an intensive one due to economic and market factors. Treatment through the SLM Approach: Development of technological packages for an agave forestry system as a basis for the production of mezcal, considering soil erosion levels and system arrangements. Promote only ecologically diversified, non-intensive systems. Design environmental and ecological monitoring stage.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities		Traditionally, women have been more responsible for the house and the area close to it. They are less involved in the field activities of the agave forestry project, but are involved in production and commercialization. On the other hand, women are worried about the possible impacts of alcoholic drink on communities, because alcoholism is a social concern. There has been no discrimination inside the communities up to now
SLM specialists/ agricultural advisers		
teachers/ school children/ students		
private sector		
local government		
national government (planners, decision-makers)		
international organization		
administration and authorities; women		

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation					✓	Balance alternatives and take decision to test the agave forestry
planning				✓		Planning, organizing and programming the project, defining responsibilities, time and initial investment. Identification of agave seeds and a proper place to install the greenhouse and nursery.
implementation					✓	Building and maintenance of greenhouse and nursery, selecting the sites for the plantation and planting. Training of land users by other land users to produce mescal according to quality rules for a recognized product.
monitoring/ evaluation					✓	In each field: monitoring plant growth, status of the protection against cattle grazing, indications of soil erosion.
Research				✓		Monitoring by some land users of some parameters defined by scientists.

Flow chart

Workshop with women from eight rural communities of the Calabozo - Potrerillos watershed. They are defining their problems and proposing solutions. EU-DESIRE project and small catchments SEMARNAT project, San Rafael Coapa community, Morelia municipality, April 2010

Author: Christian Prat

Decision-making on the selection of SLM Technology

Decisions were taken by

- ☐ land users alone (self-initiative)
- ☐ mainly land users, supported by SLM specialists
- ☐ all relevant actors, as part of a participatory approach
- ☐ mainly SLM specialists, following consultation with land users
- ☐ SLM specialists alone
- ☐ politicians/ leaders
- ☑ all of them

Decisions were made based on

- ☐ evaluation of well-documented SLM knowledge (evidence-based decision-making)
- ☐ research findings
- ☐ personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☑ Capacity building/ training
- ☑ Advisory service
- ☑ Institution strengthening (organizational development)
- ☑ Monitoring and evaluation
- ☑ Research

Capacity building/ training

Training was provided to the following stakeholders
- [x] land users
- [x] field staff/ advisers

Form of training
- [x] on-the-job
- [ ] farmer-to-farmer
- [ ] demonstration areas
- [x] public meetings
- [ ] courses

Subjects covered

Training focused on explaining which plants to select for seeds, how to create and maintain plants in greenhouses, how to transplant them and how to organise their planting in the field depending on the aim (scattered for production or in rows to create a green barrier formed from trees, shrubs, grasses and agaves)

Advisory service

Advisory service was provided
- [x] on land users' fields
- [ ] at permanent centres

Name of method used for advisory service: Plant (native agave, trees, shrubs, grasses) production advises; Key elements: Plant selection, Management of plants under greenhouse

Advisory service is very adequate to ensure the continuation of land conservation activities

Institution strengthening

Institutions have been strengthened / established
- [ ] no
- [ ] yes, a little
- [ ] yes, moderately
- [x] yes, greatly

at the following level
- [x] local
- [ ] regional
- [ ] national

Describe institution, roles and responsibilities, members, etc.

Type of support
- [x] financial
- [x] capacity building/ training
- [x] equipment
- [x] transport

Further details

Monitoring and evaluation

bio-physical aspects were regular monitored by project staff, government, land users through observations; indicators: Biodiversity, water quality, water usage, degradation and soil rehabilitation indicators. bio-physical aspects were regular monitored by project staff, government through measurements; indicators: Participatory collection of data by landowners, public officials and technicians. technical aspects were regular monitored by project staff, government, land users through observations; indicators: Indicators of improvement of technical capabilities of the nursery operators, capacity building for the production of mezcal and other products and comparative indicators of different arrangements of agrosystems based on other biophysical and economic indicators. socio-cultural aspects were regular monitored by project staff, government through measurements; indicators: Migration, poverty, education indicators by surveys and statistical models economic / production aspects were regular monitored by project staff, government through measurements; indicators: Indicators of profitability, revenue from each stage per person, economic valuation of soil improvement area treated aspects were regular monitored by project staff, government through measurements There were no changes in the Approach as a result of monitoring and evaluation There were no changes in the Technology as a result of monitoring and evaluation

Research

Research treated the following topics
- [ ] sociology
- [x] economics / marketing
- [x] ecology
- [x] technology

No information exists about the production conditions of this agave species, especially concerning the sugar quantity and quality produced by the plant which will be used for alcoholic drink production (e.g. whether it grows better in the shade or in full sunlight, or more appropriate for mature or young plants).

Research was carried out on station

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component
- [ ] < 2,000
- [x] 2,000-10,000
- [ ] 10,000-100,000
- [ ] 100,000-1,000,000
- [ ] > 1,000,000

Precise annual budget: n.a.

Approach costs were met by the following donors: government (estimated budget by ha, without alcoholic drink production): 80.0%; local government (district, county, municipality, village etc): 10.0%; local community / land user(s): 10.0%; other

The following services or incentives have been provided to land users
- [x] Financial/ material support provided to land users
- [x] Subsidies for specific inputs
- [ ] Credit
- [ ] Other incentives or instruments

Financial/ material support provided to land users

	partly financed	fully financed
equipment: tools shovel, hammer, pickaxe	✓	
plastic bags for plants, soil, compost	✓	

construction: stone	✓
construction: stone: wood	✓
metal tube, plastic for greenhouse	✓

Labour by land users was
- voluntary
- food-for-work
- paid in cash
- rewarded with other material support

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

	No	Yes, little	Yes, moderately	Yes, greatly
Did the Approach help land users to implement and maintain SLM Technologies? it is a new and easily-implemented technology with a high economic potential (commercialisation of products of very high value)				✓

Main motivation of land users to implement SLM
- ✓ increased production
- ✓ increased profit(ability), improved cost-benefit-ratio
- reduced land degradation
- reduced risk of disasters
- reduced workload
- ✓ payments/ subsidies
- rules and regulations (fines)/ enforcement
- prestige, social pressure/ social cohesion
- affiliation to movement/ project/ group/ networks
- ✓ environmental consciousness
- customs and beliefs, morals
- enhanced SLM knowledge and skills
- aesthetic improvement
- conflict mitigation
- ✓ well-being and livelihoods improvement

Sustainability of Approach activities
Can the land users sustain what hat been implemented through the Approach (without external support)?
- no
- ✓ yes
- uncertain

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view
- The project is done in a participative way where different kinds of stakeholders are involved: administrators, politicians, scientists and the public. (How to sustain/ enhance this strength: maintenance of the interaction between stakeholders from the workshops, present results to other authorities and appropriate fora.)

Strengths: compiler's or other key resource person's view
- Productive project which generates economic benefits over the medium-term (How to sustain/ enhance this strength: as a result of the money earned, it will be possible to extend the area concerned and subsides will not be necessary anymore)

Weaknesses/ disadvantages/ risks: land user's viewhow to overcome
- Women particularly, are worried about the possibility of the increase in alcohol consumption since alcoholic drink will be produced in a semi-industrial way for the external market, it is not supposed to be consumed by the communities themselves

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's viewhow to overcome
- Selling alcoholic drink is not necessarily beneficial from a health and societal point of view maintenance of a campaign to reduce consumption and develop a responsible attitude to alcohol

REFERENCES

Compiler
Christian Prat

Editors

Reviewer
Fabian Ottiger

Date of documentation: Mei 21, 2010

Last update: Julie 10, 2017

Resource persons
Christian Prat (christian.prat@ird.fr) - SLM specialist
Alejandro Martínez Palacios (apalacios56@gmail.com) - SLM specialist
Eduardo Ríos Patrón (eduardo.rios@semarnat.gob.mx) - SLM specialist

Full description in the WOCAT database
https://qcat.wocat.net/af/wocat/approaches/view/approaches_2436/

Linked SLM data
Technologies: Land reclamation by agave forestry with native species https://qcat.wocat.net/af/wocat/technologies/view/technologies_1114/
Technologies: Land reclamation by agave forestry with native species https://qcat.wocat.net/af/wocat/technologies/view/technologies_1114/

Documentation was faciliated by

Institution
- Institut de recherche pour le développement IRD (Institut de recherche pour le développement IRD) - France
- Instituto de Investigaciones Agropecuarias y Forestales (IIAF) - Mexico
- SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES (SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES) - Mexico

Project
- DESIRE (EU-DES!RE)

Key references
- DESIRE project Mexico partner (IRD 22): http://www.desire-project.eu/ free