



## Participative actions for economic benefits of agave forestry

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

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

**Aim / 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 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.

**Above left:** A 7-year-old plantation of *Agave cupreata* ("Magüey papalote"). Titzio project, Michoacán de Ocampo state (Photo: Christian Prat)

**Above right:** 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. (Photo: Eduardo Ríos)



**Location:** Michoacán state, Morelia, Mexico

**Approach area:** 0.1-1 km<sup>2</sup>

**Type of approach:** traditional, innovative, and project based

**Focus:** mainly on other activities than SLM

**WOCAT database reference:** QA MEX002 on [cdewocat.unibe.ch/wocatQT](http://cdewocat.unibe.ch/wocatQT)

**DESIRE site information:** <http://www.desire-his.eu/en/cointzio-mexico>

**Related technology:** Land reclamation by agave forestry with native species, QT MEX002 on [cdewocat.unibe.ch/wocatQA](http://cdewocat.unibe.ch/wocatQA)

**DESIRE site information:** [www.desire-his.eu/en/cointzio-mexico](http://www.desire-his.eu/en/cointzio-mexico)

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## Problem, objectives and constraints

### Problems:





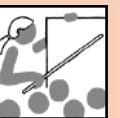
Social and economic problems: Agriculture and livestock in the region are primarily for subsistence. The level of poverty and marginalization of the people of the project site is medium to high with low education levels. People need to migrate to the cities or outside the country to supplement the family 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.

### Aims / Objectives:

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.

Constraints addressed		
	Constraints	Treatments
Financial	Potential constraints in the final stages of the project when receiving revenue from the sale of <i>mezcal</i> and other products	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
Social / cultural / religious	The social arrangement of the "ejido" requires all people to agree on moving forward with different activities. The level of education and migration.	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.
Institutional	The risk that the six-year change in administration does not follow the care programme in the area.	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.
Technical	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.	Development of technological packages for an agave forestry system as a basis for the production of <i>mezcal</i> , considering soil erosion levels and system arrangements. Promote only ecologically diversified, non-intensive systems. Design environmental and ecological monitoring stage.
Legal / land use and / water 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 <i>mezcal</i> production must be used.	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.

## Participation and decision making

Stakeholders / target groups					Approach costs in % met by:	
					- government	80
SLM specialists / agricultural advisors	land users, individual, groups	planners	politicians / decision makers	teachers / school children / students	- local government (district, county, municipality, village, etc.)	10
					- local community / land user(s)	10
					<b>Total</b>	<b>100</b>
					Total budget	2,000-10,000 US\$ (estimated budget by ha, without alcoholic drink production)

**Decisions on choice of the Technology:** It is the result of proposals, visits and discussions between all the stakeholders, so it is a joint decision.

**Decisions on method of implementing the Technology:** It is the result of proposals, visits and discussions between all the stakeholders, so it is a joint decision.

**Approach designed by:** Federal environmental authority, national and international scientists and land owners

Land user involvement		
Phase	Involvement	Activities
Initiation/motivation	Self-mobilisation	Balance alternatives and take decision to test the agave forestry
Planning	Interactive	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	Self-mobilisation	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	Self-mobilisation	In each field: monitoring plant growth, status of the protection against cattle grazing, indications of soil erosion.
Research	Interactive	Monitoring by some land users of some parameters defined by scientists.

**Differences between participation of men and women:** Yes, moderate

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.

**Involvement of disadvantaged groups:** Yes, high

There has been no discrimination inside the communities up to now



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 (Photo: C. Prat)

## Technical support

**Training / awareness raising:** Training was provided for the land users, field staff/agricultural advisors. Training was on-the-job and during public meetings. 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:**

Name: Plant (native agave, trees, shrubs, grasses) production advises.

Key elements:

1. Plant selection
2. Management of plants under greenhouse

The extension system is well suited to ensure continuation of activities

**Research:** Yes, a considerable amount. Topics covered include economics / marketing, ecology, technology. Mostly on-station research. 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).

## External material support / subsidies

**Contribution per area (state/private sector):** No

**Labour:** Voluntary, paid in cash.



## Input:

- Equipment (machinery, tools, etc.): shovel, hammer, pickaxe; partly financed
- Agricultural (seeds, fertilizers, etc.): plastic bags for plants, soil, compost; partly financed
- Construction material (stone, wood, etc.): wood, metal tube, stones, plastic for greenhouse; fully financed
- Transport: transportation of people and materials, partly financed

**Credit:** Credit was not available

**Support to local institutions:** Yes, good support with finance, training, equipment, transport

## Monitoring and evaluation

Monitored aspects	Methods and indicators
bio-physical	Biodiversity, water quality, water usage, degradation and soil rehabilitation indicators. Participatory collection of data by landowners, public officials and technicians.
technical	Indicators of improvement of technical capabilities of the nursery operators, capacity building for the production of <i>mezcal</i> and other products and comparative indicators of different arrangements of agrosystems based on other biophysical and economic indicators.
socio-cultural	Migration, poverty, education indicators by surveys and statistical models.
economic / production	Indicators of profitability, revenue from each stage per person, economic valuation of soil improvement
area treated	Regular observations by project staff, government and land users.

**Changes as result of monitoring and evaluation:** There were no changes in the approach and the technology.

## Impacts of the Approach

**Improved sustainable land management:** Yes, a high impact - it is a new and easily-implemented technology with a high economic potential (commercialisation of products of very high value)

**Adoption by other land users / projects:** it is too early to answer this question

**Improved livelihoods / human well-being:** it is too early to judge, but it is supposed to improve it

**Improved situation of disadvantaged groups:** it is too early to judge, but it is supposed to improve it

**Poverty alleviation:** it is too early to judge, but it is supposed to alleviate it

**Training, advisory service and research:**

### Training effectiveness

Land users - excellent

SLM specialists - excellent

Agricultural advisor / trainers - excellent

### Advisory service effectiveness

Land users - excellent

Technicians / conservation specialists -

good

### Research contributing to the approach's effectiveness

A large contribution (owing to the lack of information about the species of agave as well as the native trees, shrubs and grasses to be used, research is fundamental to find the best approach)

**Land/water use rights:** Help – existing land / water use rights helped greatly in the implementation of the approach.

**Long-term impact of subsidies:** Positive long-term impact – greatly; negative long-term impact – none (The major part of subsidies will finish at medium-term of the SLM approach because, as the project is supposed to generate very large funds as a result of the sale of alcoholic drink. Part of this money will replace the subsidies.)

**Main motivation of land users to implement:** Production, increased profit(ability), improved cost-benefit-ratio, payments / subsidies, environmental awareness, morale, health, well-being and livelihood improvement

**SLM: Sustainability of activities:** Yes, the land users can sustain the activities required for the approach.

## Concluding statements

### Strengths and → how to sustain/improve

Productive project which generates economic benefits over the medium-term → as a result of the money earned, it will be possible to extend the area concerned and subsidies will not be necessary anymore

The project is done in a participative way where different kinds of stakeholders are involved: administrators, politicians, scientists and the public. → maintenance of the interaction between stakeholders from the workshops, present results to other authorities and appropriate fora.

### Weaknesses and → how 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

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

**Key reference(s):** Colunga-García Marín P., D. Zizumbo-Villareal, J.T. Martínez. 2007. Tradiciones en el aprovechamiento de los agaves mexicanos: una aportación a la protección legal y conservación de su diversidad biológica y cultural. In: En lo Ancestral hay Futuro: del Tequila, los Mezcales y otros Agaves. P Colunga-GarcíaMarín, L Eguarte, A Larqué, D Zizumbo-Villarreal (eds). CICY-CONACYT-CONABIO-SEMARNAT-INE. México D.F., pp:85-112

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DESIRE

# Desire for Greener Land

Options for Sustainable Land Management in Drylands



WOCAT

World Overview of Conservation Approaches and Technologies

# Desire for Greener Land

Options for Sustainable Land Management in Drylands

*Desire for Greener Land* compiles options for Sustainable Land Management (SLM) in drylands. It is a result of the integrated research project DESIRE (Desertification Mitigation and Remediation of Land - A Global Approach for Local Solutions). Lasting five years (2007–2012) and funded within the EU's Sixth Framework Programme, DESIRE brought together the expertise of 26 international research institutes and non-governmental organisations. The DESIRE project aimed to establish promising alternative land use and management strategies in 17 degradation and desertification sites around the world, relying on close collaboration between scientists and local stakeholder groups. The study sites provided a global laboratory in which researchers could apply, test, and identify new and innovative approaches to combatting desertification. The resulting SLM strategies are local- to regional-scale interventions designed to increase productivity, preserve natural resource bases, and improve people's livelihoods. These were documented and mapped using the internationally recognised WOCAT (World Overview of Conservation Approaches and Technologies) methodological framework, which formed an integral part of the DESIRE project.

The DESIRE approach offers an integrated multidisciplinary way of working together from the beginning to the end of a project; it enables scientists, local stakeholders and policy makers to jointly find solutions to desertification. This book describes the DESIRE approach and WOCAT methodology for a range of audiences, from local agricultural advisors to scientists and policymakers. Links are provided to manuals and online materials, enabling application of the various tools and methods in similar projects. The book also includes an analysis of the current context of degradation and SLM in the study sites, in addition to analysis of the SLM technologies and approaches trialled in the DESIRE project. Thirty SLM technologies, eight SLM approaches, and several degradation and SLM maps from all the DESIRE study sites are compiled in a concise and well-illustrated format, following the style of this volume's forerunner *where the land is greener* (WOCAT 2007). Finally, conclusions and policy points are presented on behalf of decision makers, the private sector, civil society, donors, and the research community. These are intended to support people's efforts to invest wisely in the sustainable management of land – enabling greener drylands to become a reality, not just a desire.

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SIXTH FRAMEWORK PROGRAMME

# Desire for Greener Land

## Options for Sustainable Land Management in Drylands

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WOCAT – World Overview of Conservation Approaches and Technologies





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