University of Nottingham
Institute for Policy and Engagemer

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Policy Brief

Deserts as a source of sustainable development in Mexico

Desert plants: an alternative to improve the quality of life and to restore native ecosystems in arid and semi-arid zones.

Executive Summary

More than 50% of Mexican territory is covered by deserts or semi-deserts, which are home to more than 40% of the national population[1]. Despite this, the potential of these regions to stimulate sustainable development has been little explored.

In this document we highlight the potential of revitalizing deserts, and the importance of involving communities in these regions to find new alternatives to help them improve their quality of life and prepare them to face the impacts of climate change.

Considering the results of our research, we propose solutions to stimulate the revitalization of deserts and their use as a source of sustainable development.

We propose public policy recommendations that support the care of deserts for future generations and as an alternative to trigger local development.

These recommendations support the regeneration of the social fabric and contribute to the goals established in the United Nations 2030 Agenda for Sustainable Development.

Recommendations

1. Generate a national program for the integrated and sustainable management of desert and semi-desert plants that stimulates social development and the restoration of native ecosystems.

2. Generate norms, legislation, and a constitutional mandate to: -
   a) regulate the management of the natural resources of the desert and semi-desert.
   b) require that stakeholders wishing to use desert resources regenerate and maintain ecosystems, and stimulate social development, including the most vulnerable.
   c) preserve and maintain traditional knowledge and benefit the owners of that knowledge.

3. Support research and innovations that stimulate the preservation of resources and discover the potential of desert plants.

4. Stimulate the processing, generation and consumption of nutritious products derived from desert plants.

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Introduction

The vision of Proyecto Mezquite is to revitalize desert and semi-desert ecosystems to improve the quality of life of the most vulnerable indigenous and rural communities, by using mezquite and other desert plants in an ethical and sustainable way. By supporting these communities, we help everyone to live well and with dignity, and our planet and biodiversity are protected for future generations.

About 54% of Mexican territory is covered by deserts or semi-deserts[1]. These areas are particularly susceptible to climate change, negatively affecting food security.

In these areas, native plants have been traditionally used by communities. For example, mezquite (*Neltuma* spp) is a legume from which flour and nutritious derivatives can be obtained[2,3]. It has medicinal properties and its wood can be used to produce furniture and handicrafts[2].

The sustainable use of desert flora is a source of opportunity to reduce poverty and hunger, and to improve quality of life. However, it is essential to restore the ecosystems of deserts and semi-deserts[2].

In Mexico, the potential of desert resources to reduce poverty and stimulate sustainable development in a coordinated manner has not been fully explored, and there are no management programs and legislation that regulate the use, management, and revitalization of some of these resources. In contrast, in Kenya, for example, where mezquite is an introduced and highly invasive species, the government has generated a long-term action plan (2022-2030) for its management, control and use. Kenya's plan addresses mezquite's impacts on its ecosystems, communities, and economy and it details plans to use mezquite to stimulate development[4].

Context

At Proyecto Mezquite we have investigated the nutritional properties of mezquite pod flours from Mexico, Kenya and Tanzania[3]; identified the distribution of mezquite species in Mexico[5]; investigated the use of mezquite charcoal to generate water filters[6]; generated a technology transfer for mezquite pod use and food production[7]; and designed a boardgame to stimulate the use and care of mezquite[8].

Through workshops and transdisciplinary and inclusive strategic consultations, where representatives of indigenous and rural communities of the deserts and semi-deserts have contributed, we have identified bottlenecks and areas of opportunity to stimulate sustainable development and revitalize those fragile ecosystems.

Methodology

Through various projects, mezquite pods from species from Mexico, Kenya and Tanzania were collected and their nutritional properties were studied[3]. In Mexico, the territorial distribution of the different species of mezquite was studied through the collection of specimens in the field and through the analysis of electronic records of collections present in national herbariums[5].

Water filters were built and tested to treat stagnant and rustically stored rainwater using mezquite charcoal and filter materials existing in the semi-desert[6]. A transfer of technology was generated to teach communities how to process mezquite pods and generate derived products[7]. A boardgame was created to increase knowledge about mezquite and stimulate its consumption and care[8].

Through workshops and strategic consultations, problems and challenges in the desert were analysed and solutions proposed.

'If we could take care of and use our desert resources to have decent jobs that met our needs, we would not risk our lives migrating to the United States where we suffer greatly.'

Comment from a participant to one of the workshops.

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Key results:

Nutritional studies of mezquite flour show that its quality is comparable to that of wheat flour[3]. Twelve species of mezquite were found distributed in Mexican territory, with a greater number of species in areas of high marginalization. Reforestation is required to reduce vulnerability and prevent the extinction of some mezquite species[5].

Water filters developed with mezquite charcoal clean rainwater so that it is safe to consume[6].

There are barriers that prevent the use and care of desert resources. Here we propose solutions to stimulate the revitalization and use of desert resources to stimulate sustainable desert development in an ethical and inclusive way.

Increasing and stimulating knowledge

Many desert plants have been used since pre-Columbian times. Some, such as mezquite, are still considered sacred species by indigenous communities. Despite its sociocultural and economic importance for the survival of Mexican ancestors and desert communities many people are unaware of its uses and its importance to combat climate change, to maintain biodiversity, and to stimulate local development.

We propose to generate awareness programs about the importance of desert plants, of historical and traditional knowledge, and of economic, sociocultural and health benefits. These programs, intended for the public, and rural and indigenous communities, will promote the care and consumption of desert plants and their derivatives.

We propose to support research and innovations that stimulate the preservation of desert resources and discover their potential as a source of sustainable development in Mexico.

Stimulating sustainable communities

Fundamental problems in the Mexican countryside include the lack of opportunities for training and technologies and community organization. There is also lack of awareness of existing available governmental support and opportunities.

We propose to generate and establish training programs in the use, reforestation and care of desert resources, accompanied by technology and information sessions on existing opportunities and available government support.

Reforestation must be carried out with native species well adapted to the region, at the correct times according to the development of each species, and with convenient water inputs to achieve the successful establishment of these plants.

These programmes should be accompanied by family-level discussions on the importance of gender equality and the role of women in the family nucleus and community development.

Solving water scarcity problems and improving transport routes

Communities in the desert suffer from prolonged and severe droughts, consume contaminated water or use a high percentage of their time to obtain water. The problem is exacerbated by the lack of, or poor condition of, roads and bridges.

We propose to involve communities in the construction of rainwater storage reservoirs, and in improving sanitation. Communities must be educated and made aware of how to reuse water employed in domestic activities of daily living. We suggest exploring and implementing new technologies that collect water using solar energy[9].

By involving communities in the improvement and generation of local roads and bridges, and by improving access to communication, including radio, telephone and internet, life in the deserts can be made easier.

Legislation

Close working with communities is needed to strengthen resource governance and legal enforcement.

We propose to develop or update policies and legislation that regulate the management and use of mezquite, and to facilitate access to these policies by communities so that they can understand and comply with these regulations.

We propose to develop legal frameworks that are socially inclusive and implement certification systems for desert plants and their derivatives. Likewise, generate legislation that reduces deforestation of the desert and semi-desert and that promote their reforestation.

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Implications for public policy

To stimulate sustainable development and improve the quality of life in the desert, it is necessary to revitalize ecosystems and support communities to take advantage of, and care for these resources in an ethical, sustainable and responsible way.

For this reason, we call on governments to: -

1. Generate a national program for the integrated and sustainable management of desert and semi-desert plants that stimulates social development and the restoration of native ecosystems.
2. Generate norms, legislation, and a constitutional mandate to: -
    a) regulate the management of the natural resources of the desert and semi-desert.
    b) require that stakeholders wishing to use desert resources regenerate and maintain ecosystems, and stimulate social development, including the most vulnerable.
    c) preserve and maintain traditional knowledge and benefit the owners of that knowledge.
3. Support research and innovations that stimulate the preservation of resources and discover the potential of desert plants.
4. Stimulate the processing, generation and consumption of nutritious products derived from desert plants.

Climate change affects food security and desert communities are the most affected. It is urgent to preserve, explore, and sustainably use desert plants to stimulate local economies, and to safeguard these areas and resources for future generations.

PROYECTO MEZQUITE

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References and useful resources

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Websites and social media

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