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# Tourism Transformations in Protected Area Gateway Communities

Edited by Susan L. Slocum,  
Peter Wiltshier and John Basil Read IV



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## 6 Contribution of Tourism to Sustainable Development: Samalayuca Dunes (Mexico)

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### Abstract

In achieving the UN Sustainable Development Goals (SDGs), especially in protected natural areas (PNAs), it is necessary to promote the conservation of an area's natural and cultural heritage. The objective here is to potentiate a low-impact tourism model with the participation of the local community in the Samalayuca Dunes, Mexico, to achieve the SDGs. To this purpose, a participatory low-impact tourism strategy was built with stakeholders in gateway communities, based on three pillars: natural/cultural heritage; economic development; and social wellbeing. The strategy integrated six stages: a perception study on the development model; situational diagnosis of the Public Use Zone; study of natural and cultural resources for tourism use; tourism carrying capacity; sustainability criteria; and design of interpretive ecotourism trails. As a result, a sustainable tourism protocol, recommendations for a management and public use programme, an interpretation and environmental education programme, and a code of conduct for visitors were transferred to the community.

**Keywords:** tourism, sustainability, local participation, protected natural areas (PNAs), Samalayuca Dunes

### 6.1 Introduction

Tourism is a socioeconomic activity that generates wealth and employment, so it can play an important role in reaching the United Nations Sustainable Development Goals (SDGs) (García, 2019). Therefore, taking advantage of the benefits tourism provides must be key to achieving these goals and putting into practice the development agenda projected towards 2030 (United Nations World Tourism Organization, n.d.). Especially in protected natural areas (PNAs), it is necessary to promote the conservation of natural and cultural heritage, and at the same time favour the endogenous development of host communities.

The results of the participatory study of tourism development with sustainability criteria in the Samalayuca Public Use Zone, located south of Ciudad Juárez, Mexico, are presented; the study context includes the PNA Samalayuca Dunes and their area of influence, integrating 11 gateway localities of tourist interest of mainly local and regional scope. This project is important, because in this area a spontaneous, exogenous and non-participatory model of tourism development has been formed, which highlights the incompatibility of this model with the SDGs due to the obvious symptoms of unsustainability noticed by the local community and specialists from different academic, research

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and management institutions. This contradiction between the current model and the desired future of sustainable development constitutes the scientific problem assumed as the object of study.

Two scientific questions were formulated: How can tourism contribute to sustainability in Samalayuca, and what can be done to achieve it? and What should the role of gateway communities be in achieving this purpose? The research aim was that of potentiating a low-impact tourism model with the participation of the local community in the Samalayuca Dunes as a way to achieve the SDGs. As a possible answer, the following assumption was formulated: tourism could contribute to sustainability in Samalayuca, and gateway communities could play an important role in achieving this purpose, turning this destination into a more integrated, planned and participatory tourist space, with tangible benefits for the host communities and increased visitor satisfaction.

The main outcome of this research is the contribution of community stakeholders to the understanding of current tourism development, specifically within the realm of gateway communities, and the search for transformations towards sustainability. Regarding this, the specific outcomes are: situation assessment and identification of the attractions that characterize the vocational and tourist potential; perceived analysis of the possible contribution of tourism to the fulfilment of the SDGs and the current impacts that limit them; actions for the prevention and control of the negative impacts of tourism and the conformation of the desired low-impact tourism development model to achieve the SDGs; and projection of a participatory tourism development strategy to achieve the SDGs based on three pillars: natural and cultural heritage; economic community development; and social wellbeing. These outcomes are of value for local development as they offer an alternative option to traditional tourism development, which lack a community base and reflect a high background of negative impacts.

## 6.2 Literature Review

### 6.2.1 Implications of sustainable tourism theory

The process of formation and maturation of the sustainable development concept is complex and has been highly debated since its appearance in the late 1980s, due to different disciplinary interpretations (Calvente, 2007; Lohmann and Panosso, 2008; Orozco and Núñez, 2013; Vollero *et al.*, 2019). For this reason, its evolution has been associated with diverse approaches, including ideological, social construct, paradigm, and theoretical models, among others. The modern meaning of this term defends, although not without controversy, the integration of three dimensions related to development, which include the economic, social and environmental scope. During the last decades, numerous scientific studies have contributed to a better understanding and operationalization of the concept of tourism sustainability (Cabrini, 2014), clarifying the need to 'emphasize sustainable tourism as a strong paradigm and vision for an alternative development' (Perona and Molina, 2016, p. 527).

This research uses the definition of sustainable development contained in the Mexican legislation, accepted as an evaluable process through criteria and indicators of an environmental, economic and social nature, which tends to improve quality of life and productivity, based on the preservation of ecological balance, environmental protection and the use of natural resources (Ley General del Equilibrio Ecológico y la Protección al Ambiente, 2019). According to the General Tourism Law, sustainable tourism allows optimal use of natural resources suitable for tourism, helping to conserve them by respecting the sociocultural authenticity of the host communities, preserving the cultural, traditional and architectural values, and ensuring economic activities that improve living conditions by offering benefits, such as employment income, and other social services (Ley General de Turismo, 2019). Its implementation will allow benefits to the community along with the minimization of negative impacts, thus promoting community

social development. Sustainable development recognizes that tourism should not negatively affect the quality of life of the community, but rather maximize benefits for cultural heritage and support the adoption of behaviour codes (Global Sustainable Tourism Council, 2012).

To understand the concept of sustainable tourism as a paradigm of development, different models and theoretical approaches have been presented, which can be postulated to improve comprehension of the contribution of tourism for achieving the SDGs. Among the selected models for the present study are: the '3P' model of sustainability: people, planet, profit; the triple bottom line model: economy, society and environment; and the circle of sustainability model: economics, ecology, politics and culture (Slaper and Hall, 2011; Thatcher, 2014; University of Wisconsin, n.d.). The conceptual and methodological triangulation of these models is useful for clearly visualizing this study's objective since they are based on a holistic conceptualization of development

and provide the basis for the incorporation of an integrative approach and the preventive management of impacts.

The assumed theoretical-conceptual implications permit the explanation (Fig. 6.1) that tourist value enhancement of the environmental attributes of the PNAs as attractions that characterize the tourist vocation can be favoured by incorporating the SDGs (input). Based on this premise, an analysis of planning scenarios was necessary, which started with the diagnosis of the problems of the current tourism model as a basis for the projection of the desired state and the corresponding strategy to achieve it (output), which is based on the three pillars of sustainability; this theoretical positioning implies the organization of community-based tourism, which incorporates local community participation as a methodological approach.

Among the instruments to promote sustainable tourism, the 2030 Agenda and the Strategic Framework for Sustainable Tourism in PNAs were selected. The United Nations

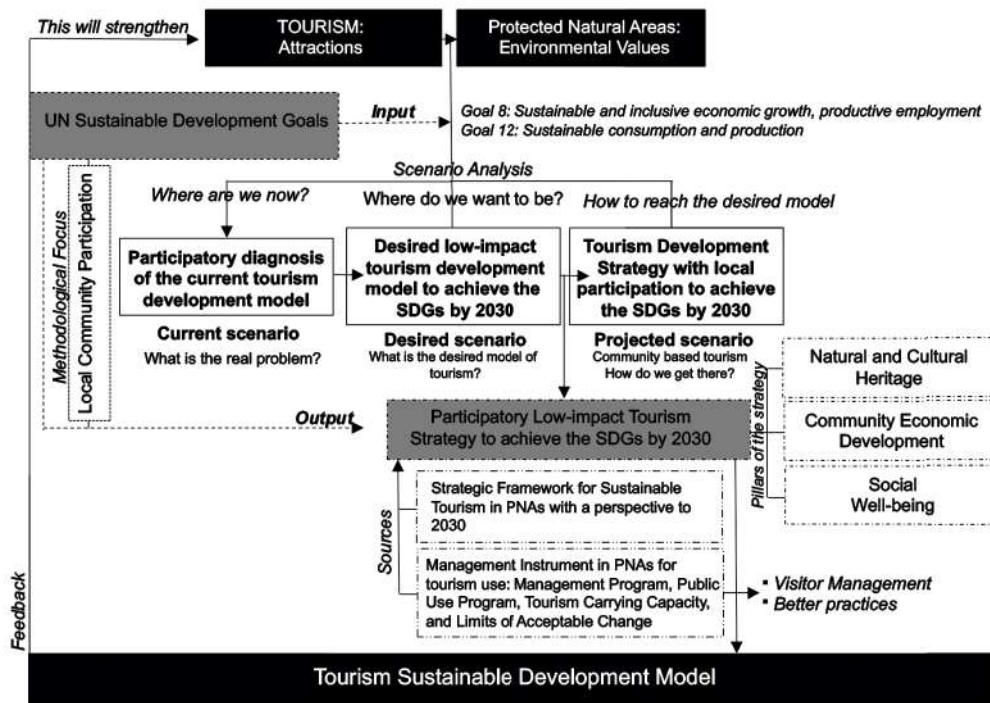


Fig. 6.1. Theoretical model (figure courtesy of the authors).

Agenda 2030 (2015) includes 17 SDGs with specific aims to be reached in the next 15 years, and goes further than its precursor, the Millennium Development Goals (MDGs), adopted in 2000, which should have been accomplished by 2015. Although both were intended to address the fundamental causes of poverty and the universal need for equality and human development for all (United Nations, 2015), the United Nations World Tourism Organization (2020) is in charge of promoting responsible, sustainable and accessible tourism and has in its sights the fulfilment of the 2030 Agenda and the SDGs with universal scope.

Of interest to this study is Goal 8, which proposes the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all, and Goal 12, aimed at guaranteeing sustainable consumption and production. A tourism sector that adopts such priorities could play a significant role in accelerating global transformation towards sustainability. In particular, Target 12.b indicates that developing and applying instruments that make it possible to closely monitor the effects of development, with a view to achieving sustainable tourism that creates jobs and promotes local culture and products, is advisable.

To achieve the SDGs in PNAs, it is necessary to introduce the concept of low impact environmental tourism. The definition of the National Commission for Protected Natural Areas in Mexico (CONANP, 2013) was used, which defines it as an environmentally responsible tourism modality, consisting of travelling or visiting relatively undisturbed natural spaces and cultural manifestations of the present and the past, for enjoyment, appreciation and study, through a process that promotes conservation, has low environmental and cultural impact and induces an active and socioeconomically beneficial involvement of local populations.

The Strategic Framework for Sustainable Tourism in PNAs (CONANP, 2018) allows the identification of the necessary components for the use of tourism and the minimum conditions of sustainability, generating a baseline of strategic information that facilitates decision-making. It recommends, among the instruments for the

management and ordering of tourist use, the Management Program (p. 30); the Public Use Program (p. 31); the Study of Tourism Carrying Capacity (p. 31); and the Study of the Limit of Acceptable Change (p. 31). It also proposes mechanisms for the prevention and control of impacts, such as regulations for visitor management and the development of tourism initiatives based on 'better practices', for the benefit of local inhabitants inside, and in the influence areas, of the PNAs.

### 6.2.2 Role of communities in PNAs for achieving the SDGs

The integration of communities into tourism development is a basic requirement for participatory sustainability management (Clausen and Gyimóthy, 2016; Bridgewater and Rotherham, 2019). This approach is particularly necessary when the interests of the parties involved are opposed in the space–time dimension; primarily in cases where the expectations of tourists and the community are not convergent (Wang *et al.*, 2014; Crosby, 2015; Tseng *et al.*, 2019). It is advisable to favour the convergence of interests and expectations among the interested parties (Silva *et al.*, 2017), so that positive memorable experiences are promoted (Crosby, 2015). The participation of all the actors involved at the local level, specifically within the neighbouring gateway communities, constitutes an appropriate framework to potentiate the required synergies (Grybovyč, 2012), including individuals, groups, public and private institutions, programmes, services and businesses (Rodríguez, 2015; Guccio *et al.*, 2017).

According to Skewes *et al.* (2012), it has become common to construct a critique of tourism according to the modernization pattern that it implies when it generates conflicts for the environment and minority societies. Current efforts to modify these stereotyped patterns mark the point where trends, such as community-based tourism, emerge, recognizing that tourism is supported by three key concepts, namely: community, conviviality and everyday life (Henríquez *et al.*, 2010). Such statements make tourism a more humane

phenomenon, without necessarily losing its essence.

Searching for alternatives to traditional models, locally-based tourism (LBT) arises as a strategy to promote development and environmental conservation for the sake of sustainable tourism; implies an organisational model of the activity focused on local control over the planning, management, and benefits of tourism ... associated with this local control, different notions of community being implicit and becoming part of the LBT.

(Ruiz-Ballesteros, 2015, p. 19)

It is recommended that various concepts 'such as community-based tourism, community ecotourism, and rural community tourism could be framed within the broader concept of LBT' (Ruiz-Ballesteros, 2015, p. 20), an approach used in this study. It takes the local community as the primary agent, which is why the 'main particularity of the LBT is its contribution to local development' (Ruiz-Ballesteros, 2015, pp. 40–41).

LBT is a sustainable option for economic and social development, together with a balanced distribution of benefits at the local level (Hamilton and Alexander, 2013; Perona and Molina, 2016). This approach is understood as 'a sustainable alternative to mass tourism, which has commercialized territories, displaced human populations and has transformed their spaces and living conditions' (Palomino *et al.*, 2016, p. 6). According to Palomino *et al.*, 2016, p. 8), LBT 'proposes a different use of the territory and its resources, both by those who provide the service and by users, as it involves valuation practices in situ, the recognition of cultural heritage of the communities and their interaction with them'.

Therefore, it is necessary to promote active and integrated community participation in planning and decision-making processes from the local level (Guccio *et al.*, 2017; Pulido and Pulido, 2017). Regarding tourism planning and management, Monterrubio (2009) introduces an important consideration by noting the relationship between tourism and the community dimension through community participation. The community tradition refers to the degree of participation exercised by the community when carrying out planning (Grybovych, 2012); this tradition suggests

that the benefits provided by tourism favour the community. Of course, these communities will also be responsible for tourism planning and monitoring the projects, programmes or plans (Monterrubio, 2009).

In this way, the community that inhabits the destination should always be the most interested in obtaining knowledge about tourism in its coexistent space and should also enter the decision-making process, assuming the benefits and damages that may arise (Waligo *et al.*, 2015; Lin *et al.*, 2017). If the majority of the community does not agree with the tourist activity, the development of the sector will be conflictive and dysfunctional at some point in time (Valls, 2004), which is why the perceptions of the community, regarding tourism development, are of great value for the sustainable management of the destination.

### 6.3 Methodological Framework

This research is of an applied, explanatory-interpretive and transversal type, structured in two stages: diagnostic and projective. Qualitative, socially-interdisciplinary and deductive approaches were used, since the research spanned from the general theory of tourism sustainability to its implementation in the practical solution of a problem. Mixed information sources were used to obtain categorical and numerical data.

The orientation of the methodology was grounded on the principles of participatory strategic planning (Osácar, 2005). The strategic diagnostic phase was based on the study of perceptions of the current and desired tourism model, introducing the SDGs to the analysis of the vocation and tourism potentiality. In the strategic projection phase, the study of tourism potential (inventory and evaluation of attractions) was carried out, as well as the functional zoning. Based on previous results, discussion actions for the prevention and control of the negative impacts of tourism, and the projection of a participatory tourism development strategy to achieve the SDGs, were proposed.

The tourist attraction inventory was conducted via fieldwork by the research team with members of the gateway community. The



information on each attraction was completed in situ and photos were taken, which were later evaluated by other local participants in this study (n=16). The perception of the tourist attractions was evaluated using three variables: tourist attraction (indirect observation and previous experience); attraction capacity (Likert scale); and affective-motivational relation (percentage).

The analysis units corresponded to stable groups of people living in Samalayuca with a sense of belonging to this area and to geographic units corresponding to the research polygon. Non-probability convenience sampling was applied, in which the sample was made up of locals who participated in focus groups (n=8). Analytical-synthetic, hermeneutic-interpretive modelling, and geospatial theoretical methods were used, as well as empirical methods, such as participant observation, document analysis and group studies through discussion. The data collection tools included observation guides, focus group script, checklists and inventory tables. The types of non-comparative measurement scales used included: graphical data measurement, Likert, semantic differential and data analysis matrices. The study of the realities of

the participants was based on their testimonies, anecdotes, comments, opinions and examples.

Research development was based on the stages that make up the research method (Fig. 6.2), acknowledging scientific observation as a starting point to arrive at new scientific knowledge. The stages and research tasks were: documentary research; characterization of the research context; diagnostic study; development of solution proposals; and preparation of conclusions and recommendations. The development of strategies for the adoption of the research included the dissemination of the conclusions among the community stakeholders, the use of the results by decision-makers, and the commitment to feed back the conclusions of the research to the community and inform them of the policies and the best practices to implement.

#### 6.4 Situation Assessment

The Samalayuca Dunes are located in northern Mexico, within the Chihuahua Desert, and are considered to be the dunes with the greatest biodiversity in North America. This space is represented by a system of wandering dunes of fine

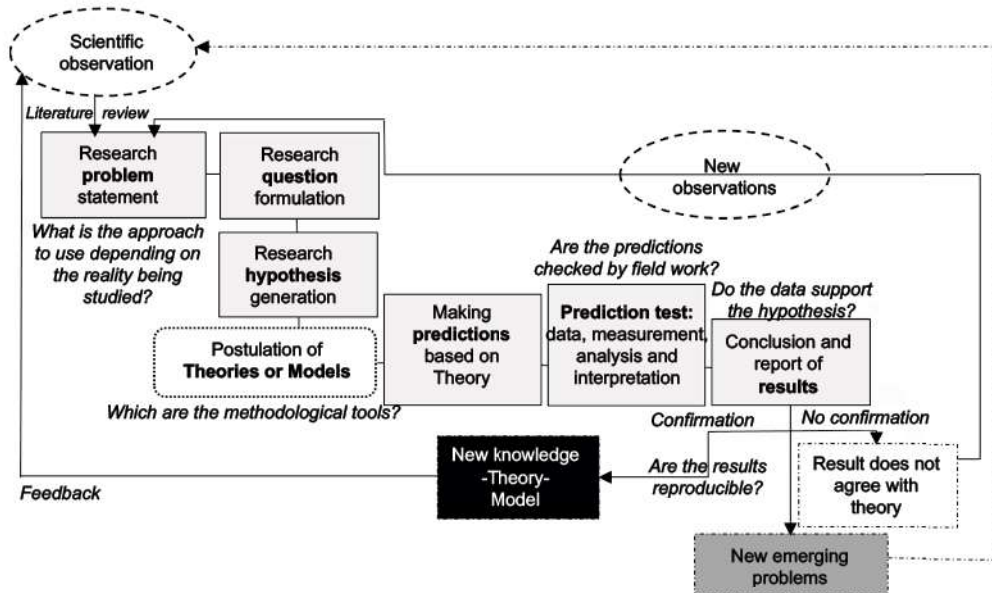


Fig. 6.2. Stages of the scientific method (figure courtesy of the authors).

sand composed of silica dioxide, recognized as the highest dunes in Mexico, so it constitutes one of the most important representations of dunes nationwide and one of the most extraordinary dune areas on the planet. This territory belongs to the hydrological region of closed basins in the north, in arid conditions, without superficial water flows but with important groundwater reserves. It is characterized by significant endemisms – the habitat contains approximately 240 species of plants and 150 species of fauna. It also contains more than 50 archaeological sites and is the location of the settlement of rural communities.

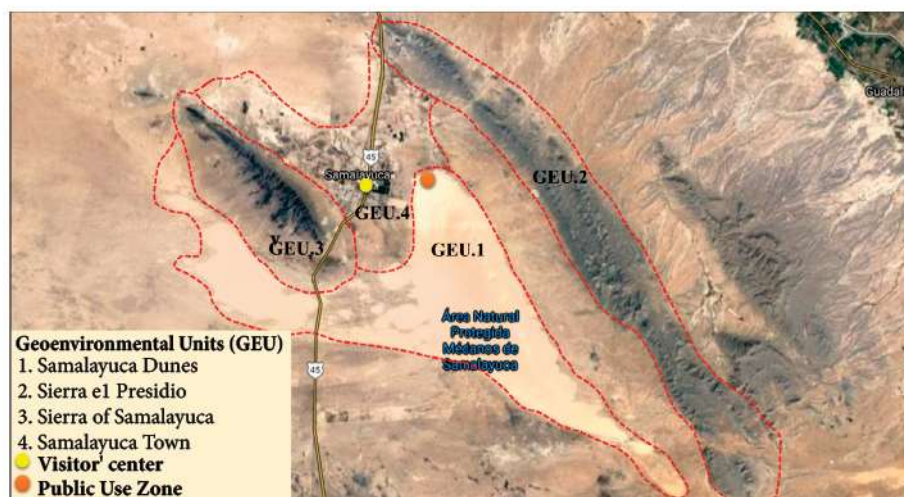
The origin of the human population is related to the establishment of cattle ranches favoured by the presence of wells or springs. The official foundation of the town dates from 1880 as a result of the Mexico–Juárez Railway. The main town, and other rural settlements, are located very close to the north–south road axis that makes up Federal Highway 45, otherwise known as the Pan–American Highway.

The main economic activities are stock-breeding, agriculture, charcoal making, mining, beekeeping and tourism, which represent the main sources of employment, although most of the local population do not work in tourism. According to the participants, these activities provide the main sources of income; in this

regard, one of the *ejidatarios*<sup>1</sup> reported ‘... I am dedicating myself to beekeeping, which I like to do not as a job but as a hobby ... which in addition to contributing to the economy provides benefits to health and the environment’. Another participant added that the people of the village are not wealthy – things have to be done according to the characteristics of the place. For example, they build cabins with materials from the area. In the vicinity of Samalayuca, industrial activity is also represented, as a cement plant and two thermoelectric plants are located there.

The geospatial structure of the environment, determined by the uneven combination of its components, and the different types and levels of anthropic assimilation, allowed the delimitation of four geoenvironmental units (Fig. 6.3).

In 2009, part of the Samalayuca Dunes was declared a PNA under the category of Protection of Flora and Fauna. Its general purpose is the conservation, protection, restoration and management of the habitat of wild flora and fauna species. Its scenic landscape is of great beauty, and it is possible to carry out recreational, educational and research activities, as well as the sustainable use of existing natural resources, and to promote the development of this space, although tourism is not explicitly stated within the Samalayuca Dunes designation policy. As



**Fig. 6.3.** Geoenvironmental units (image courtesy of the authors/ with [www.google.com/maps/@31.3240644,-106.4653535,49178m/data=!3m1!1e3](https://www.google.com/maps/@31.3240644,-106.4653535,49178m/data=!3m1!1e3)).

part of its purpose, the management programme establishes the preservation of natural environments, archaeological, historical and artistic vestiges, as well as tourist areas and others of importance for the recreation, culture and identity of the Chihuahuan Desert (Comisión Nacional de Áreas Naturales Protegidas, CONANP, 2013).

#### 6.4.1 Attractions that characterize tourist potential

Through fieldwork with community members, an inventory of tourist attractions was carried out. It was found that the attractions comprise natural, rural, archaeological, cultural and artificial resources structured at 11 sites. Based on the inventory, a participant evaluation of the potential of tourist attractions was conducted according to their capacity to attract tourists and the affective-motivational object–subject relationship, identifying the most valued attractions (Table 6.1). The geological/geomorphological formations corresponding to the dunes were evaluated in the international hierarchy due to the ecological, aesthetic, cognitive and recreational values that they possess, which attract a flow of international tourists.

#### 6.4.2 Impact perception

A brief environmental history associated with anthropic activities carried out within the natural environment was reconstructed. Access to the dunes is relatively recent, and according to locals, it was related to filming in their landscape. A participant commented:

When offering scenes of interest to world-famous film directors and actors in the 1980s, the film's recording team ... opened the current access, before that, for us the dunes were only like a dream when we saw the sand hills from afar. In the absence of access, it was not easy for people to get there because the walks were too long. If someone needed to go it was only to open spaces such as drinking fountains for their livestock.

Later, the tourist boom in the dunes put an end to raising cattle, goats or sheep, and the vocation of the locals was modified. They adapted their agricultural activities (*nogalera*), although it is still possible to find livestock activity in *Ejido Ojo de la Casa*.

Such growth in tourism has not been planned, nor oriented towards sustainability. One participant pointed out that, in terms of tourist activity, the visitors must be taught to take care of the environment. The park needs to make the origin of the place known, not only to tourists, but also to the community, since residents have seen a sudden increase in tourism, and they are unaware of how to take best advantage of it. The participants recognized the importance of tourism as an economic activity for the site. The main positive impacts perceived by the participants were related to the revaluation and putting into use of the dunes, the generation of income and sources of employment, the role of CONANP in the conservation and protection of the site, and the regulation of visitor flows through the entrance fee.

The main perceived factors that bring about negative impacts are: insufficient planning; illegal activities; conflicts of interest; lack of environmental culture; and lack of control and systematic monitoring. Among the perceived environmental impacts that affect progress towards sustainability were: extraction of sand; mesquite felling; changes in land use; accumulation of tyres and other contaminants; extraction and sale of the desert rose (an intricate rose-like formation of crystal clusters); illegal extraction of native fauna and introduction of foreign species; as well as the practice of illegal mass tourism activities (uncontrolled overtourism) and inherited impacts from earlier times.

It was identified that the main negative impact felt by the locals is environmental degradation and contamination. In the opinion of a participant, 'since the tourist boom began to be generated in the dunes with people who no longer went to the Juárez Valley, the tourist activity brought activities that give a bad image and cannot be controlled, giving the appearance of a canteen, brothel, drug addiction, and dirt'. Another participant mentioned that one of the problems generated by tourist activity is pollution, specifically garbage. Another *ejidatario* mentioned, as a problem, the consumption of

**Table 6.1.** Perception of tourist attractions.

Tourist attraction	Attraction capacity	Affective-motivational relation
	Functional value: 5 Aesthetic/scenic value: 5 Environmental value: 5 Historic value: 5 (natural) Symbolic value: 5 Cognitive value: 5 Authenticity: 5 Accessibility: 5 Infrastructure and services: 4	Spectacular: 95% Very nice: 5% Nice: – Moderately pleasant: – Unpleasant: –
	Functional value: 4 Aesthetic/scenic value: 5 Environmental value: 4 Historic value: 5 Symbolic value: 5 Cognitive value: 5 Authenticity: 5 Accessibility: 4 Infrastructure and services: 3	Spectacular: 80% Very nice: 20% Nice: – Moderately pleasant: – Unpleasant: –
	Functional value: 5 Aesthetic/scenic value: 5 Environmental value: 5 Historic value: 5 Symbolic value: 5 Cognitive value: 5 Authenticity: 5 Accessibility: 4 Infrastructure and services: 3	Spectacular: 85% Very nice: 15% Nice: – Moderately pleasant: – Unpleasant: –

**Fig. 6.4.** Samalayuca Dunes (photo courtesy of the authors).**Fig. 6.5.** Exhacienda (photo courtesy of the authors).**Fig. 6.6.** Sierra of Samalayuca (photo courtesy of the authors).*Continued*

**Table 6.1.** Continued

Tourist attraction	Attraction capacity	Affective-motivational relation
	Functional value: 5 Aesthetic/scenic value: 5 Environmental value: 5 Historic value: 5 Symbolic value: 5 Cognitive value: 5 Authenticity: 5 Accessibility: 4 Infrastructure and services: 3	Spectacular: 85% Very nice: 15% Nice: – Moderately pleasant: – Unpleasant: –
	Functional value: 5 Aesthetic/scenic value: 5 Environmental value: 5 Historic value: 5 Symbolic value: 5 Cognitive value: 5 Authenticity: 5 Accessibility: 4 Infrastructure and services: 3	Spectacular: 90% Very nice: 10% Nice: – Moderately pleasant: – Unpleasant: –

**Fig. 6.7.** Petroglyph (photo courtesy of the authors).

**Fig. 6.8.** Desert rose (photo courtesy of the authors).

alcohol and the use of motorized vehicles within the area, which can cause accidents to families who visit the dunes.

Another problem of interest for the community is the environmental degradation of the dunes. A participant pointed out:

Historically we lived from the exploitation of sands that we sold, which represented extra income for us. It was before knowing the importance of keeping the resources in place. When CONANP arrived, the regulations changed so that the sand remained in the area.

This is how many times we think only of the immediate economic benefit. In the case of *El Vergel* it is better that the roses of the desert are preserved in the place, so that they are always there and people come to see them.

The indiscriminate looting of mesquite firewood is another important problem. This tree has been replaced with *plumerillo*, which has ornamental value, although it is a foreign element to this place and consumes a lot of water.

The lack of first aid and security services for tourists was identified, and the health of tourists is not assured if an incident occurs: 'in case a visitor is run over in the dunes, where do we take them to receive medical attention? However, we do have a permanent ambulance in Samalayuca with equipment and trained personnel'. It was mentioned that *Dunas Campestre* has a fixed-mobile unit in high seasons. It was, therefore, proposed that the Union of Recreational Centres forms a committee responsible for a medical service, in charge of the wellbeing of tourists and visitors, sustaining this project through monetary and individual contributions. It was stated that CONANP is in charge of everything related to tourism and is the arrowhead to open up to tourism, therefore CONANP is the only agency available to take responsibility.

However, it was made known that the people who visit the dunes feel safe, and it is the responsibility of the local residents to continue maintaining that feeling of security. Currently the place is quiet without criminal problems, despite the fact that in the town there is no police station and just three agents to serve the four *ejidos*. It was reiterated that the town lacks medical care and that a positive change has been seen because of charging entry to the dunes.

Among the management decisions best valued by locals, in response to the situation of territorial deterioration that has occurred up to now, we should highlight:

- The regulation of the number of people entering the PNA – a resident commented, 'It is better to have the area controlled since the fewer people entering the site, the better the existing resources can be taken care of.'
- The charge of 100 pesos (less than US\$5) as a fee to enter the area, intended for the conservation of the natural area – a participant commented, 'at the beginning we were afraid that our resources would decrease. With the change we have the same income, the area is more controlled, that is, fewer people with the same income and we have seen more control related to the garbage and bad vices.'
- Planning studies of the territory – a participant commented, 'Work is already under

way on the carrying capacity study based on the limit of acceptable change.'

#### 6.4.3 Prevention and control of negative impacts

Searching for transformations towards sustainability, the need for environmental education for residents and visitors was highlighted. A participant affirmed, 'among the things that we should focus on is tourism awareness and care for the environment, with support from the university and CONANP'. Another participant expressed the need to place more containers to deposit garbage, even though in the last year there has been a decrease in garbage, which may be due to the administrators and the emphasis placed on this issue. More signage for environmental awareness, with the use of images, was suggested as they have a greater impact because images speak for themselves.

Emphasis within the community on the importance of taking care of the environment was also commented upon. Since the growth of tourism and the environment are not in conflict, integration is sought, in order to form a group that really values the characteristics of the site. A participant mentioned, 'in my family we have managed the use of resources in a similar way, however, with the passage of time, my father and I have considered making a tourist corridor so that they can observe the desert roses on site and carry out accompanied tours, and place camping areas as a complement for the visitors who go to the dunes'.

One of the most debated topics was the conflict between extractive activities and the activities of those who wish to preserve natural values. A participant affirmed:

I consider that the exploitation of the desert rose should take place in a balanced way. There are pieces that can be used to have an economic income, while other stones can be used for souvenirs, and others kept in the place as part of a gallery-museum. In this way, there would be a balance in the area and the identity would not be lost. It is necessary to know the stone capacity that we have, since up to now, it has not been known how much there is and if it could allow extraction for greater use. Lately

very small stones have been obtained in the extraction which we use for costume jewellery. My family has a more direct connection with other commercial activities, and we have remained outside the tourist activity, perhaps this is due to a lack of knowledge and advice, however, we have interest and the possibility of integrating ourselves into tourism.

The immediate benefit is seen in the extraction and commercialization of the desert rose. The idea of an interpretive geotourism trail is evaluated, where visitors pay for an experience with this attraction in situ, which could produce economic and environmental benefits. According to the recommendations of the participants, the use of desert roses could be to expose the rocks and explain their characteristics, and at the same time they would be able to rescue mesquite and plant these typical trees of the area.

#### 6.4.4 Tourism contribution to the SDGs

Regarding Objective 8, the locals recognized that the resources they have are an important productive factor for economic growth and a source of jobs; in the same way they acknowledged, with respect to Objective 12, that the production of goods and services associated with heritage values could potentiate better local development. Such is the case in the opinion of one participant when acknowledging that 'among the activities carried out is sandboarding, which attracts many visitors and even champion athletes from Brazil ... for which reason I consider that a better use of this activity should be given for the welfare of the community'. These perceptions coincide with the reported findings in the reviewed literature (Crosby, 2015; Clausen and Gyimóthy, 2016) and with the theoretical and methodological approach established in Fig. 6.1.

The importance of the site and its international value was recognized, which participants related to the motivation it awakens among visitors from different countries. A participant stated that:

Although there is a lack of knowledge in the community to understand this importance, it is true that the actions by CONANP, among which

are the teaching of environmental courses, mainly to children who are a fundamental part of the project, have allowed us to recognize the resources of this place, as well as care for the environment.

Another participant referred to the international hierarchy of attractiveness by saying, 'I have lived most of my life here in the town, as my grandparents were among the founders, so I think the international importance that dunes have should be recognized.' Similarly, they reported the arrival of different international tourists, and one participant commented that:

As I was in charge of caring for the dunes for six years, I have seen people from various Mexican states and also foreigners ... with the exclusive interest of visiting the dunes. In the talks I had with a Spaniard, he told me that he had had great interest in coming to these dunes, even though he lived closer to the Sahara.

#### 6.4.5 Desired tourism development model for achieving the SDGs

Regarding future projections, an integrated tourism project should be formed, on a reduced scale, that is neither massive nor invasive. The idea of developing large projects, such as hotels, was not supported by the community, as it would provide jobs for outsiders, which would not represent benefits to the community. A participant said, 'we do not want megaprojects, and we are grateful for decreases in the number of visitors, which has allowed greater conservation'. Another suggested: 'A museum where nature is appreciated. My family has dedicated itself for years to the extraction of the desert rose ... Once they took me to analyse a rose, it was there where I understood the treasure it represents, I realised the effects that extraction will bring.' There is an ideal for the future of which tourism is a part, indicating 'one of the dreams for which we are working is to turn Samalayuca into a magical town'.

The desired model should be endogenous and participatory, and include diversified territorial development, which is supported by the potential of the attractions of each site, and through which specialized products and

representative activities can be offered. This idea is based on the fact that

it is necessary to take advantage of the benefits of each *ejido*; *Ojo de la Casa* with petroglyphs, *El Vergel* with desert roses, *Villa Luz* with the dunes, and Samalayuca with agricultural activities, beekeeping, among others ..., offering the visitor activities in the different places, the tourist would get more involved with the community.

The importance of active participation in the project was accepted for preserving the cultural and historical heritage of each site and those recreational activities that can be carried out, which was evidenced by the introduction that *El Vergel* is having to tourism. It is advisable to encourage and build trust among residents, so that they seek support and advice, providing them with the confidence to undertake a project, and in this way, the financial resources can be obtained. They are the owners of their resources and have the ability and talent to make the most of them; all they need is guidance and advice so they can make the best decisions.

The perceptions and comments of the participants confirm the lack of knowledge in the community regarding tourist activity, although it is true that they comprehended its importance, as well as the actions carried out by CONANP in favour of sustainable tourism. A notable sense of belonging of the community stakeholders with respect to the PNA, and the commitment to contribute to its care, was corroborated, an aspect that stands out as one of the first feelings which emerged among the participants. It was possible to observe, mainly among the women, a feeling of love and positive attitude towards the care and preservation of the area and the will to integrate the community into tourism.

### 6.5 Tourism Development Strategy for Achieving the SDGs

Taking, as a premise, that the current scenario is characterized by unsustainable conditions, with the features of oversized mass tourism, movement towards a tourism sustainability scenario based on the SDGs was proposed. Based on the reviewed literature and the statements

presented in Fig. 6.1, the establishment of a model of tourism development committed to six attributes was decided: attractiveness; security; inclusiveness; reliability; competitiveness; and community wellbeing. A participatory sustainable tourism strategy was built with community stakeholders based on three pillars: natural and cultural heritage including protection and conservation, reduction of environmental impacts, and environmental education and interpretation; economic community development with locally-based attractive products, decent employment and local economic benefit; and social wellbeing incorporating respect for local identity, self-management and local security, and inclusion and community participation (Fig. 6.9).

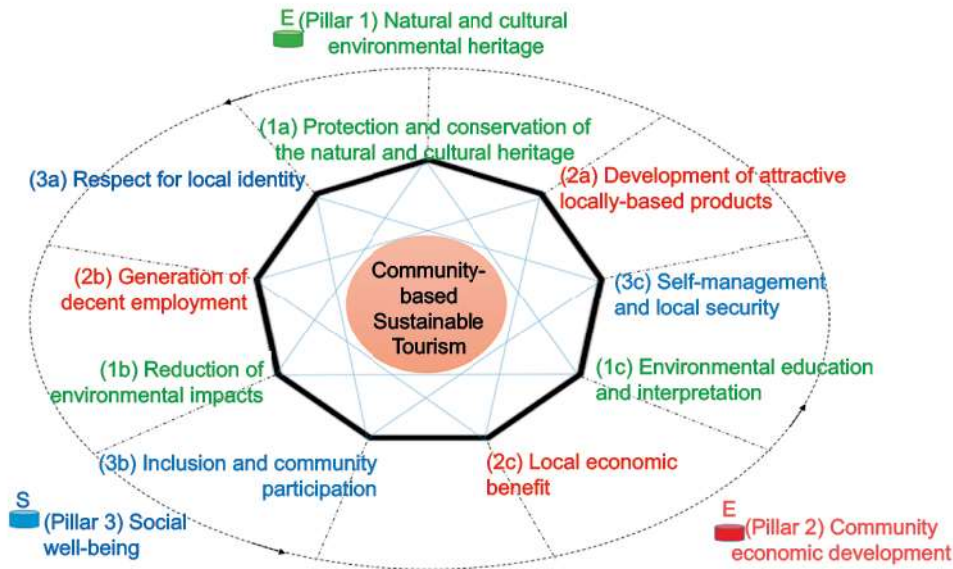
Based on the construction of the model, 35 strategic actions were identified to promote minimum conditions of sustainability. These strategic actions were integrated in three stages as a part of a protocol to achieve sustainability (Table 6.2). The time horizons will allow the transition from priority to more long-term actions, according to the type of problem and the feasibility of execution.

A tourist zoning scheme was built for the Public Use Zone with sustainability criteria (Table 6.3), since this space requires the highest levels of protection and management. Different areas of tourist use were identified with the participation of locals, projecting the predominance of uses in the extensive category and restricting the intensive use of these areas. The zoning took into consideration the three theoretical frameworks of sustainability presented in this research – the economic, social and environment aspects – and the theoretical model presented in Fig. 6.1.

### 6.6 Conclusion

Our conclusion is to emphasize the need to sensitize the different community stakeholders to the understanding and implementation of the concept of sustainable tourism as a paradigm and development model for achieving the SDGs, recognizing the value of the instruments implemented in a participatory manner for sustainable tourism management,





**Fig. 6.9.** Sustainable tourism development model (figure courtesy of the authors).

and the minimization of the impacts generated by tourism. It was found that the contribution of tourism to sustainability in Samalayuca is feasible if the role of local gateway communities continues to be strengthened as part of the planning and management activities of the territory, with integrated criteria of economic growth, protection of the natural/cultural heritage and social wellbeing. Such an approach requires a conceptual and operational rethinking of current tourism to enhance compliance with the SDGs by 2030, a horizon towards which a multifunctional, more integrated, planned and participatory space is projected with the purpose of promoting a more attractive, experiential and safe offer, which in turn promotes high levels of visitor satisfaction.

The favourable contribution of local participants to the diagnosis and strategic projection of sustainable tourism development was corroborated by the locals. It was based on their knowledge and wishes related to the protection of their natural and cultural spaces, as well as the will to place themselves 'in' tourism as a way to obtain economic and social

benefits. The community views coincided with the main findings reported in the reviewed literature, especially in relation to the steps local inhabitants should follow for more sustainable tourism.

The limitations of the study were the small sample size, the lack of updated databases and poor scientific production on the subject at the local level. In the next stages of research, it will be necessary to promote the design of an interpretive trail, a tourist code of responsible behaviour, education and environmental interpretation manuals, as well as to favour the application of tourism marketing and commercialization with sustainability criteria. The incorporation of standards of sustainable tourism to the operation and management of tourism, the use of financing opportunities and development of sustainable projects has been recognised by the community stakeholders as decisive for future sustainable development. For the previously recommended reasons, new research questions, a literature review and predictions should be elaborated, as indicated in Fig. 6.2.

**Table 6.2.** Sustainable tourism protocol.

Actions for sustainable tourism development		
(A) First stage	(B) Second stage	(C) Third stage
Inventory of attraction sites	Adaptation to climate change	Regulations for tourism service providers
Pressure and intensity of use according to carrying capacity (overtourism)	Information for all stakeholders	Stakeholder participation
Care of natural and cultural heritage sites	Fair and equitable employment and training opportunities for women, youths and minorities	Protection of local access to genetic resources within the PNA
Protection of local cultures and traditional knowledge	Tourist awareness of all stakeholders	Support for local entrepreneurs and fair trade
Protection of wildlife	Training for tourism service providers	Integration of economic information on tourist activities
Security for all stakeholders	Study and monitoring of local community opinion	Use of local products and services based on their ecological, social and cultural conditions
Water and energy consumption	Provision of information and interpretation tools to the visitor	Holiday operations for visitors' orientation
Waste management	Low impact transportation	Monitoring of environmental costs throughout the tourism product chain
Controlled visitor management	Inventory and knowledge about risks	Articulation of tourism service providers in value chains
Visitors' code of responsible behaviour	Visitor satisfaction	Investment in tourism promotion and dissemination
Environmental monitoring and inspection	Access for all stakeholders	Investment in infrastructure and equipment with approaches to bioarchitecture and environmental technologies
Local community satisfaction	Crisis and emergency preparedness and response	

**Table 6.3.** Tourist zoning scheme.

Functional zone	Infrastructure and equipment	Tourist recreational/support and related services	Tourist activities
<b>Administrative zone</b>	Offices, bathrooms, multipurpose room, scientific research and monitoring centre	Drinking water supply, electricity supply, mobile network, internet access, toilets	–
<b>Common use zone</b>	Entrances and exits, parking, esplanade (plaza), ramps and walkways with handrails, viewpoints and observation tower, information module, artificial shadows, food processing, restaurant, guardhouse, first aid, dry toilets, garbage deposits, signage, environmental education classroom	Supply of drinking water, electricity supply, food and beverages, lockers, information (brochures, guides, interpretive signs, preventive, restrictive and informative signs, others), mobile network, internet access, toilets, equipment rental/sale, security, ground transportation, adventure/nature operator, sledding sales	Observation of geological forms and relief (desert roses, dunes, etc.), observation of flora and fauna, observation of the landscape, observation of the sky (astronomical), souvenirs and crafts purchase
<b>Camping zone</b>	Tourism signage	Drinking water supply, electricity supply, accommodation (camping), toilets, mobile network, internet access, security	Camping, social activities, participatory games
<b>Family use zone</b>	Ramps and walkways with handrail	Mobile network, internet access, security	Sandboarding, observation of geological forms and relief (desert roses, dunes, etc.), observation of flora and fauna, observation of the landscape, observation of the sky (astronomical), yoga and meditation, filming and photography, concerts and events, screenings of movies
<b>Children's play zone</b>	Tourism signage	Safety, assistance and guidance, specialized guides	Children's sandboarding, educational games, observation of geological forms and relief (desert roses, dunes, etc.), observation of flora and fauna, observation of the landscape, observation of the sky (astronomical)

*Continued*

**Table 6.3.** Continued

Functional zone	Infrastructure and equipment	Tourist recreational/support and related services	Tourist activities
<b>Extreme activities zone</b>	Tracks, stands, signage and tourism signage	Mobile network, internet access, security, assistance, specialized guides, equipment	Sandboarding, motocross, cycling, running, observation of geological forms and relief (desert roses, dunes, etc.), observation of flora and fauna, observation of the landscape, observation of the sky (astronomical)
<b>Environmental interpretation zone</b>	Interpretation centre, interpretive trail with stations and interpretive stops, ramps and walkways with handrails, tourism signage, QR codes to inform about flora, fauna, etc.	Mobile network, internet access, interpretive guides, security, environmental education and interpretation services, biosecurity of nature destinations (viruses)	Interpretive hiking, observation of geological and relief forms (desert roses, dunes, etc.), observation of flora and fauna, observation of the landscape, observation of the sky (astronomical), environmental education workshops, guided tours

### Note

<sup>1</sup> *Ejido*: land possession system in Mexico consisting of granting land to a group of people for their exploitation. *Ejidatario*: agrarian subject member of the *ejidal* nucleus. Source: Chamber of Deputies of the H. Congress of the Union, *Agrarian Law*. Title Three, Chapter I, Section One and Section Two. Last Reform DOF 25-06-2018. Available at: [http://www.diputados.gob.mx/LeyesBiblio/pdf/13\\_250618pdf](http://www.diputados.gob.mx/LeyesBiblio/pdf/13_250618pdf) (accessed 4 February 2022).

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