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Building up the future: participative design of a rural development plan for the coastal communities of the arid regions of Baja California, Mexico

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Abstract

The difficult conditions in which the rural communities of developing countries live, as is the case of Mexico, are mainly due to social and economical situations of poverty, unemployment, low population, and distance from the urban centres and states administrations. On the other hand, these communities are linked to the deterioration of the environment and pollution due to domestic and productive activities as well as overexploitation of marine and land resources (marine turtles, whales, cactus, etc.). The situation is worse due to the lack of strategies and detailed policies that could promote the development of these remote areas, based on the active participation of the inhabitants that are directly related to the conservation aspects and the resource management. A reconnaissance of these communities was carried out in order to identify the conditions, needs, interests and social capital, as well as the natural capital and potential resources, using the Complex System Theory. The establishment of institutional linkages between the actors involved are essential for the design of a rural development plan and to the improvement of life quality to the people.

Keywords: rural development, arid-coastal regions, community participation, sustainable development, complex system theory.



1 Introduction

The precarious situation of the rural communities of Baja California (Figure 1) in Mexico, has been affected mainly by the national economic situation, due to structural adjustment regulations that have been implemented in the country in order to give an answer to this, and due to the decreasing of fishing resources from which the economy of these communities depended on, partially or totally.

The present study represents an interdisciplinary and multi-sector effort, developed by researchers, inhabitants of the rural regions and representatives of the municipal and state governments. The problems that are affecting these communities are several: natural, socio-cultural and human capital deterioration, lack of infrastructure and public services (such as water and electricity), transportation (these communities are very far from the urban centres), and also there is very few participation of the inhabitants to implement and propose projects together that could be oriented to its development.

To provide basic services, access to culture and education, to strength the productive activities and specially to diversify these activities constitutes essential elements for a strategic development design. To reach this goal is a challenge in the national and worldwide context, as well as in the economic and political platform. However, the governments, the society and the institutions as a whole, must be involved in order to reach a good rural development plan even when the economic resources and the state contraction, otherwise, the social and environmental consequences will be worse every day due mainly to poverty, as well as the velocity of natural resources deterioration and the environment are the great challenges to work with, this requires rapid and efficient actions to improve the rural communities FAO [1]. The coastal character of Baja California State constitutes without any doubt a palliative for the limitations that are imposed in the arid context of its geography. There are several activities that could be very important to develop as factors for economic growth: aquaculture, resource development of the marine biology richness, culture of native plants (endemics of the region), handcraft development, Low impact tourism, among so many others, however, it is necessary to carry out a systematic evaluation of these alternatives in order to identify the previous works done in the area and to carry out others that could recognize the natural, human and social capitals, as well as the available technologies and the market opportunities. By the other hand, it is also necessary to identify the lack of infrastructure that the communities have to develop new productive activities. This is the case for instance of a proposal of electricity supply by means of the use of renewable energy resources such as wind and sun, because, this service supply could be also a trigger for economic development, but at the same time could be also used for other purposes such as water desalination and education by distance, to improve the quality of life of these people.

The present project proposed three development stages to study and to analyse the communities problems, these are:

Diagnosis and characterization of the communities;

Building up consensus in the development of an strategy;



Mechanisms for the implementation of actions to develop community productive projects.

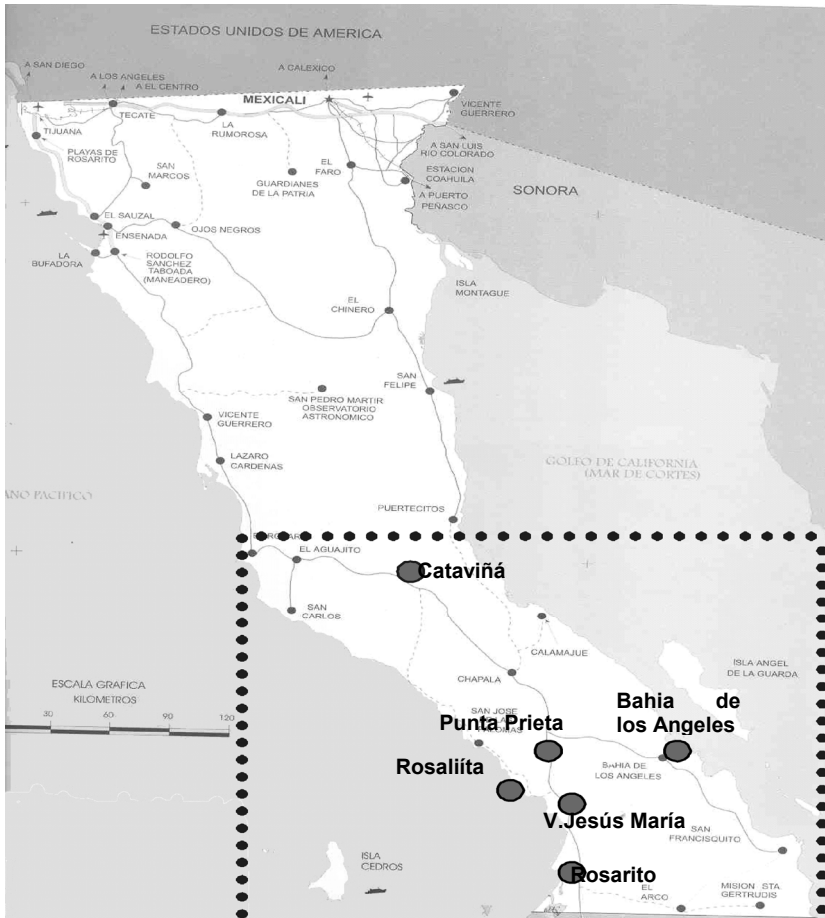


Figure 1: Study area.

The study proposes an integrative and participative vision of the actors involved in the development process. By one hand, there are the communities and the poor people that live in these areas. The people that haven't had the access to the elemental rights of action in the decision-making system, and by the other hand, the state institutions that are doing big efforts for the development of these, based upon different models but all of them based mainly in the improvement of the economic conditions. However, the history has shown that the problems and their solution is much more complex and requires an effort that includes the collective participation of the different actors in the design, planning and implementation of the development strategies that also includes the resolution of specific problems for each locality.



Poverty is not only the lack of incomes or human development; poverty is also the incapacity to be heard by the others, the lack of empowerment and representation. This conceptualization is linked with the complexity of the strategies that will have to be considered for the reduction of poverty, because there are other factors—social, cultural, among some others—that are unique of each region and/or community and these must be included in the development of these strategies.

2 Methodologies

The Complex Systems Theory was a tool to be applied in the whole stages of this study; however, there are certain specific methodologies that were applied depending on the different disciplines and depending on the different purposes. To use the Complex Systems Theory also allowed us to have another kind of vision about the different problems, these are spatially and temporally interdependent, whereas disciplinary research isolates problems from one another.

For the reconnaissance of the two communities under study, the Participatory rural appraisal (PRA) was also used, this is described by the World Bank [2], Scrimshaw and Gleason [3] and Chambers [4].

All the surveys and interviews with the inhabitants as well as with the key actors of the government agencies followed the Miles and Huberman [5] methodology, which includes the sampling, based on the own characteristics of each one of the communities. Key informants were identified. The analysis and data processing used the qualitative statistics proposed by Miles and Huberman [5] and that one established by Taylor and Bogdan [6]. One of the objectives is to identify the number of village people and to characterize these villages, in order to include all the facts concerning, for example: the marginalized groups, the minorities, the ancient people, the disadvantaged groups (disabled), professionals, people that do not live in the villages the whole year, visitors and/or tourists, main activities of each group people, dynamic of the population (migration), among so many others. We analysed each one of the components of quality: housing, services, energy supply, education, income, etc. All the surveys and interviews with the inhabitants as well as with the key actors of the government agencies followed the Miles and Huberman [5] methodology, which includes the sampling, based on the own characteristics of each one of the communities. Key informants will be first identified. The analysis and data processing used the qualitative statistics proposed by Miles and Huberman [5] and that one established by Taylor and Bogdan [6]. Finally, the strategy of rural development will be elaborate by the academics, the government agencies actors and the inhabitants of all the communities.



3 Results

3.1 Regional characterization of the rural settlements

3.1.1 Geographic location

The studied areas are located in a very arid region, to the south of Baja California State, at the Ensenada Municipio. It is limited to the North by San Agustín in the parallel 30°, to the south, by El Berrendo, at parallel 28°, to the East by Sea of Cortez and to the West by the Pacific Ocean.

Three aspects based the criterion that was used to delimit the studied areas: hydrologic basin divisions, territorial economic fluxes and the urbanization degrees of these localities (State Urban Development Programme (1996-2001).

3.1.2 Population

The population of the Municipio of Ensenada, in 2000 [8] was 370,730 inhabitants. Based upon the information consulted, the population has grown in general 3.64% but the southern regions show a negative behaviour -0.9%, this includes Santa Rosalita with a -2.0, and with the exception of Bahía de los Ángeles that has a 2.8% growth.

3.1.3 Planning and development

Rural planning must be framed in two levels of analysis: regional and local. The first level belongs to the vision of the totality of communities that share a territory and maintain different type of economic, social, environmental and management relations. It also means a long term and preventive vision, which intention is, to give orientation to a series of actions during time to achieve different development goals of the set of establishments. Meanwhile, local planning is associated with a tactical and short term vision, that approaches urgent community needs.

Planning for the southern region of Ensenada was developed in two levels of analyses, that later allowed us to generate differentiated strategies. The regional stage approached the demographic, social and economic aspects of the population, the behavior of the system of cities, ground, aerial and sea communication lines, urban equipment and electrical infrastructure, water and drainage, land uses, land possession, public units of municipal management and policies that affect the territory. Natural resources, historical and cultural patrimony were also analyzed to examine their real potential and limitations for productive advantage and to assure their conservation. The following points are results obtained up to this stage:

1. The system of cities is integrated by two medium importance localities that belong to Guerrero Negro on the south and to San Quintín on the north, where Cataviña and Los Ángeles Bay plays a hierarchic role on the level of concentration of rural services.
2. The localities of the south of Ensenada, are considered to have a relative index of socioeconomic marginalization according to SEDESOL.
3. The South zone has experienced negative growth rates, where expeled people belongs to the young sector.



4. Primary sector: fishing and agriculture has diminished their participation in the regional economy, meanwhile, the third sector has increased to locate itself in almost a 50%.
5. Regional infrastructure for the development of productive activities and settlements has been kept behind on matters such as roads, tele communications, suburban transport, water, electrical energy, health and education.
6. The South zone is located in a Protected Natural Area, where the use of natural resources is regulated, and so their inhabitants find restrictions for their productive advantage
7. Some of the potential activities presented on the South zone in the coast localities of Los Angeles Bay are: opportunities for the tourist development oriented to sport fishing, navigation and beach tourism. Los Angeles Bay, on the other hand, presents greater possibilities of diversification towards aquatic activities, attractive scenic of the landscape presented on the terrestrial surroundings and islands, in addition to the ecological interest of its flora and fauna and its historical and cultural manifestations. Fishing is another resource with high aptitude.
8. Other productive activities such as forest, agricultural and cattle show low aptitude, although for some settlers they represent complementary resources for their maintenance.

Diagnosis of the local level, considered quantitative as much as qualitative aspects seen through the analysis of the urban equipment, infrastructure, environment and housing. All of which reflect specific problems of the localities related to the population's standard of life qualitative terms. They also speak about quality of services given such as water; energy and drainage as well as housing, land possession, health, education, recreation, culture and sports. Within the framework of regional strategies the purpose is to affect those projects that could be a key to promote the development of the South zone in the long term and which have to do first of all, with fortifying the system of cities. One part should deal with the infrastructure introduction of energy and water so; it would be possible to supply new services. There should be considered the design of electrical energy by alternative sources as wind and sun (hybrid systems). This will allow later discouraging and replacing energy production by burning fossil fuels. Concerning to potable water, the introduction of desalination plants and residual water treatment should be promoted, in order to make a sustainable use of the water. The community requires to reinforce and to improve the quality of the road network and air landing fields, the harbour and telecommunications infrastructure to extend the services of education and health mainly.

Other aspects that must be approached in this level are oriented studies for the evaluation of compatibility, economic and social feasibility that offers the marine resource to impel the development by fishing and/or tourism activities that would increase economic dynamics of the establishments. It is also required to reinforce the infrastructure and programs oriented to support municipal management through delegations, because of the given conditions of distance among populations and costs charged to the people for any proceeding. In order to close,



there should be considered the necessity to integrate and to coordinate the efforts of ecological planning and urban development to assure the pursuit and evaluation of different actions through several kinds of instruments and programs offered by different government levels. Within the framework of local strategies short term goals that contribute to the partial improvement of the population standards of life are considered. This case handles the ecological planning, human settlement planning, and their productive areas. About infrastructure, the increase of the actual energy and drinking water networks is presented. As for drainage the consideration would be the design of the entire network. As far as land and housing, there are several actions suggested to lower overcrowding and poor quality construction, there are actions oriented to improve housing, promote water and energy saving and conservation and some others are oriented to legalize land possession. Relocation of housing in zones of risk should be examined as a complementary action.

Within local strategies the paving of sub urban roads are considered so dusting would be lowered and destruction of flora and fauna by the indiscriminate step of vehicles would be avoided.

3.1.4 Natural resources and productive activities:

Baja California has a great potential for the development of fishing and aquatic activities over the Sea of Cortez, as well as at the Pacific Ocean (Figure 2). The State Development Plan [9] pointed out that a great and important activity in the State is the fishing one that is concentrated at the Ensenada Municipio. This activity was outstanding during the 1995-1997 period in jobs generation, around 9 000. Also, the volume catches of high economic values species increased, directed to the external market for instance with the tuna, urchin, shrimp, abalone, and lobster. The production of aquaculture also had important increases in the volume of production, from 517 tons to 1 447 for the same period, in which the oyster had 80%, mussels, 17%, clams 1.4%, tuna 1.0% y 0.6% de abalone. This activity has been strengthened through rural aquaculture programmes, whose results are oriented to the culture of fish and other marine organisms for local consumption, and promoting small-businesses in order to improve food supply and to develop of diverse activities. Aquaculture that includes new species as abalone, shrimp, tuna and different clam species has been also promoted. Santa Rosaliita and Bahía de los Angeles have been considered in these initiatives. As it has been mentioned before, it exists also the opportunity to develop the potential of the ocean in order to produce electricity and potable water production.

Among the problems that face the fishery's activities there are: fishing effort concentrated in a limited number of species, lack of planning for the catches according to the international markets perspective and the potential state resources, modernization of the fishing industry that can satisfy the national and international norms, access to bank loans and decentralization of the decision making system at federal level.



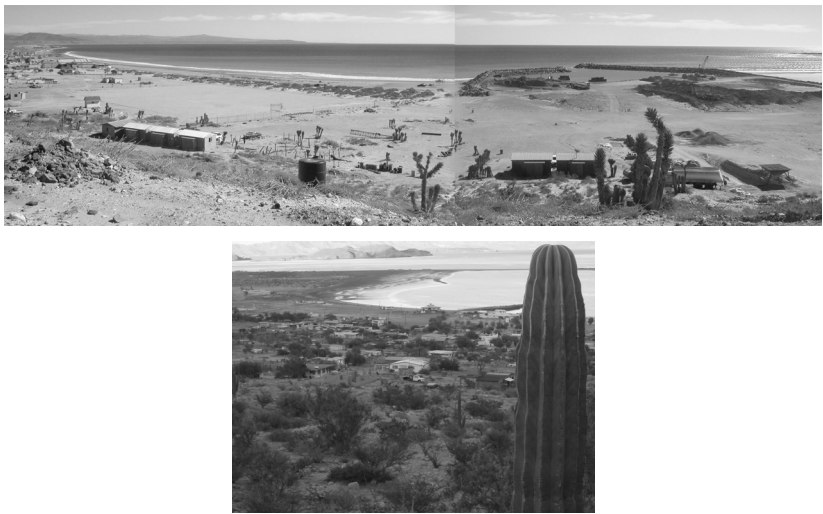


Figure 2: Community's landscapes, up Santa Rosaliita, down, Bahía de los Angeles.

3.1.5 Cultural heritage

The National Institute of Anthropology and History (INAH) has a record of 15 archaeological sites (Figure 3), located in the Municipal of Ensenada and classified according to its archaeological manifestation. Seven of these sites have rock-cravings, four have pictography, one shows archaeological circles, four “concheros” (anthropogenic shell deposits) and one site with rock carvings and pictography. The Heritage shows deterioration and this is due to natural agents but is also due to vandalism and look susceptible to be destroyed.



Figure 3: Cultural heritage.



If we have to resume the values of the flora, fauna, landscape, cultural heritage, and tourism potentiality, we considered the next possibilities:

- Santa Rosalita shows opportunities in terms of tourism development, related to aquatic activities, fisheries, navigation, and beach recreation.
- Bahía de los Angeles shows possibilities due to the activities diversity in relation to other communities. The attractions could be aquatics, landscape (islands and different environments). It is a very interesting area due to the endemic flora and fauna (marine and terrestrial) of the region (*e.g.* Cactus Forests), and it also counts with cultural heritage regions very near from the town.

3.2 Community problems

In this section, we are going to present the results of the participative workshops that were carried out with the inhabitants of the communities. Also, this section shows the results of the surveys and personal interviews that were applied. The next problems were identified and after ratified by the people:

- Social capital deterioration (drug addiction and alcoholism)
- Lack of public services (electricity, potable water, drainage, solid waste management)
- Lack of health services
- Over-exploitation of natural resources (furtive hunting and fishing)
- Lack of educative services (kindergarten, high school, etc)
- Land ownership
- Community participation and organization
- Lack of institutions and authorities

Also, the participants of the workshops declared the lack of opportunities in general, but they are very worried about the young people that do not have access to good education services, nor cultural or sport activities, hence, they get so easily involved in drugs. Opportunities are needed in so many other ways: jobs generation, lack of investments on productive activities, accessibility to the communities (lack of transportation), lack of infrastructure, etc). However, the inhabitants can visualize other potentials for its development as it was in the past: mining, tourism, fishery activities, aquatic sports, cultural heritage, observation to beautiful landscapes, conservation areas (such as the islands), guided walking to observe endemic flora and fauna, among so others.

3.2.1 Water and energy

Mexico has a surface of almost two millions of square kilometres, with an average yearly precipitation of 777mm, which is equivalent to 1,640km³. However, its spatial distribution is irregular. In 42% of the territory, mainly in the north region, the annual average precipitations are lower than 500mm, and in some cases, as it is the case of the proximal areas to the Colorado River, these do not exceed 50mm. On the contrary, in 7% of the country, there are areas of the territory in which the annual precipitations rates are over 5000mm [10]. At present, Mexico faces serious problems related to water supply in several regions



of the country due to a bad spatial and time distribution of the resource. Desalination has been an option in several countries to produce drinking water, water designated to industrial uses and for other kind of uses. There are several industries and hotels that already count with desalination plants, for instance, the Federal Commission of Electricity (CFE) is producing (by means of the multiple effects process) drinking water from seawater with a cost of $7.00/\text{m}^3$ (0.60 US) in some regions of the country. There are several small plants from capacities of $1 \text{ m}^3/\text{day}$ to $1,000 \text{ m}^3/\text{day}$, in industries, hotels and small remote communities.

The average cost of desalination using inverse osmosis is of $0.35/\text{m}^3$ US dollars and for seawater is $1.54/\text{m}^3$ US dollars. The desalination cost of seawater decreases when the production capacity of the plant increases. The consumption of energy decreases also with the increase of production. In Mexico, the CFE has a system of desalination in Rosarito, Baja California, which has a cost of $7.00/\text{m}^3$ Mexican pesos (approximately 0.70 US dollars). The investments costs to treat brackish water vary between $380/\text{m}^3/\text{day}$ and $562/\text{m}^3/\text{day}$ and between 1,341 and $2,379/\text{m}^3/\text{day}$ to desalinate seawater. The energy factor is the most important issue to be taken in account when desalination of seawater is considered.

The use of renewable energies such as solar to desalinate seawater is an option that has been proved in low populated rural communities. Specifically, the distillations "*house type*" has proved their efficiency in the production of low volumes of drinking water, in which the cost of investment is not high and could be also built by the users.

The increasing use of desalination due to demographic and industrial growth makes necessary an increasing of energy sources. Desalination systems driven by renewable energies are still scarce and usually have limited capacities. At present, these only represent approximately 0.02% of total desalination capacity [11]. However, many reasons make the use of renewable energies suitable for seawater desalination [12]:

- a) Plant location: Many arid regions are coastal areas and renewable energy sources are available
- b) Seasonal changes: Often freshwater demand increases due to tourism, which is normally concentrated at times when the renewable energy availability is high, especially in the case of solar energy.
- c) Energy availability: Conventional energy supply is not always possible in remote areas, on the one hand because of difficulties in fossil fuel supply, and on the other hand because the grid does not exist or the available power is not enough to drive a desalination plant. In such cases, the use of renewable energies allows sustainable socio-economic development by using local resources.
- d) Self-sufficiency: Renewable energies allow energetic diversification and avoid external dependence on energy supply.
- e) Technology: The development and commercialisation of desalination systems driven by renewable energies make possible technology exportation and cooperation among countries with low development.
- f) Environmental impact: Seawater desalination processes are strongly energy consuming, therefore, the environmental effects of fossil fuels



consumed is important. Note that total worldwide capacity of desalted water is about $23 \times 10^6 \text{ m}^3/\text{d}$ [4].

- g) Economics: Fresh water requirements make necessary the transport of fresh water by different means (ship, buses, etc), which implicates high costs and improper hygienic conditions.
- h) Operation and maintenance: The operation and maintenance of renewable energy systems are normally easier than conventional energy ones; therefore, they are suitable for remote areas.
- i) Promising commercial perspectives: The cost reduction of renewable energy systems has been significant during the last decades.

Many energy supply schemes have been implemented in Mexico, including the use of renewable energies but the failure of these has been due to the acceptance of these technologies in the different regions and that these programmes were not seen as an essential part of a strategy for rural development. Some issues we think can have an impact on scheme success and at this point we recommend being included in a successful electrification rural programme:

- The decision-making process and management
- The way in which energy service needs are assessed
- Ability to pay and tariff levels
- Competition and reliability
- Relationship with equipment suppliers which also include the training for maintenance
- Appropriate financing options
- Respect for the different local cultures applied to the use of energy
- Acceptance of the new technologies in their cultural values

With regard to coupling seawater desalination technologies to renewable energy systems, several important facts must be considered, such as the potential of the resources based on the end uses that the communities declared, specific characteristics of the system location and also, economic considerations. As the studied communities are located in remote areas, the technology selection must be done according to the criteria given by [3] that includes: simplicity, easy handling, availability, maturity of the technology, guarantee of fresh water production, suitability of the system to the characteristics of the location, possibility of future increase of the system capacity, efficiency, among some others.

The technology recommended for these rural areas is a hybrid (solar-wind) system to drive a desalination unit is a promising alternative because of the complementary characteristics of both energy sources and because the coastal areas included in the study region, have suitable wind and solar resources. Some of these technologies have been developed and are under use [13, 14, 15, 16].

4 Discussions

The rural communities have tried, along the time, to incorporate to the development by means of the different activities that the environment and the



natural resources had offered, as is the case of the fisheries and tourism. However, the way in which the whole community should be involved and participate, offers very few possibilities for the majority, because so few has the opportunities to get it. The situation is still worse when these communities do not have the basic services to open other possibilities for development. The water is not potable and also the service and the drainage are not continuous, this is also the case of the electricity. Situation is complicated when the basic services are not supplied, for instance, the electricity (good quality, regular supply during the whole day and low cost, at least the same as urban areas); water is not potable and there is not a tube system; gasoline is scarce (there is not a gas station), there is not drainage, neither health public centres, garbage recollection and public lighting. According to what security corresponds, there are only two policemen. There is not urban transportation neither in the urban area nor to other places, do people use their own cars.

There are two main productive activities in the communities: fishing and tourism (the last is most developed at Bahía de los Ángeles) to satisfy their basic needs but for both of these, the electricity, water, gasoline and transportation are needed, as well for the development of the region.

One of the biggest problems is the lack of social organization and participation in both communities. The consensus of common strategies that could be implemented in order to set what kind of development and actions must be considered and implemented.

Finally, the lack of institutional administration processes, make things worse for these communities because the requirements to participate in the fishing or tourism related activities are restricted and make not possible that participation could be established in a democratic way, leaving the most weak and poor people out of these opportunities. The most privileged groups exploit the natural resources and hire the rest of the community inhabitants, giving low salaries, temporal jobs, without social and health rights, because the empowered groups have the ways to move out and be transported to the urban centres where they can get the permissions, to put in order the legal procedures with the government agencies and to be in order in the tax system.

Building up the future must be considered as a common goal to reach by all the inhabitants in these communities. People must be a participant in their own development and build up the capacities to do it. The inhabitants require empowering the social organization nets to solve their differences or at least work with these in order to solve them for the good of all. Development of these communities must go hand by hand not only in finding and making opportunities but also with the political compromise of the decision-makers

5 References

- [1] FAO. The quality of growth. Oxford University Press.262pp. 2000.
- [2] World Bank. The quality of growth. Oxford University Press.262pp. 2000.



- [3] Scrimshaw, N.S. and G. R. Gleason, (Eds). Rapid assessment procedures—qualitative methodologies for planning and evaluation of health related programmes-- . International Nutrition Foundation for Developing Countries. 1992.
- [4] Chambers, R. Rural appraisal: Rapid, Relaxed and Participatory. Institute of Development Studies, Discussion paper No 311. 1992.
- [5] Miles, M.B. and A.M. Huberman. 1994. Qualitative data analysis: an expanded sourcebook. 2nd edition. 338pp. 1994.
- [6] Taylor J. and R. Bogdan. Introducción a los métodos cualitativos de investigación. Editorial Paidós. 343pp. 1998.
- [7] Boltvinik, J. Y E. Hernández Laos. 2000. Pobreza y distribución de ingreso en México. Ed. Siglo XXI , 354pp.
- [8] Instituto Nacional de Estadística, Geografía e Informática (INEGI). Censo de población 2000. México, 2000.
- [9] Plan Estatal de Desarrollo. 2001. Gobierno del Estado de Baja California, México.
- [10] Comisión Nacional del Agua. Informe 1989-1993, México. 1993.
- [11] Arreguín Cortés, F. And A. Martín Domínguez. Desalinización del agua. *Ingeniería Hidráulica en México*, Vol. XV, Número 1, pp. 27-49. 2000.
- [12] García-Rodríguez, L. Seawater desalination driven by renewable energies: a review. *Desalination* 143 (2002) 103-113pp. 2002.
- [13] European Commission, Desalination Guide Using Renewable Energies, 1998.
- [14] Maurel, A. Desalination by reverse osmosis using renewable energies (solar-wind) Cadarche Centre Experiment. Seminar on new technologies for the use of renewable energies in water desalination, Commission of the European Communities. DG XVII for Energy, Centre for Renewable Energy Sources, Athens, 1991.
- [15] Weiner, D., D. Fisher, E.J. Moses, B. Katz and G. Meron. Desalination, 137(2001) 7-13.
- [16] P. Metzelopoulos and D. Bougas. Autonomous wind energy-photovoltaic water desalination unit in Thisassia Island. Presented at the conference in Policies and Strategies for Desalination and Renewable Energies, sponsored by the Renewable Energy Sources Unit of the National Technical University of Athens in cooperation with the Organization for European Development, Support and Research-TIFIN and Heliotopos, S.A., Santorini, Greece. 2000.

