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## Fisheries cooperative organization and sustainable development in the rural community

**Abstract:** Fishing cooperatives are located in areas characterized by basing its economy on natural resource use. This representation suggests the need to implement practices that contribute to economic, social and ecological region.

This paper presents preliminary results of research aimed at identifying the impact of fishing cooperatives in sustainable development of the region. The collection of data was conducted through observation and semi-structured interviews.

The findings suggest that in Sinaloa there are fishing cooperatives facing problems resulting from overfishing, overcapacity of fishing fleets, increased fishing population and poaching, the unclear definition of fisheries property rights and fisheries management, among others. Even though, the government provides support to solve them but they are insufficient.

From the above it is concluded that the situation of the fishing cooperatives and the communities where they operate, has become a social problem that cannot be solved without the participation and involvement of stakeholders and is required to form a common front to improve economic, social and environmental development by joining efforts with the government and the people of a community.

**Key words:** Cooperative, organization, sustainable development.

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## **Introduction**

Cooperatives are organizations that are identified to be located, many of them in areas whose economies are based on the use of renewable resources such as fisheries and agriculture, among others. This representation suggests that these organizations have the need to implement practices that focus on environmental care, however it is recognized that it can be difficult mainly because of the investment required and the lack of funds they own.

The integration of economic, social and ecological objectives is part of the daily work of cooperatives. On the one hand represent avenues for cooperation, collective action, building and strengthening the community and on the other hand operate as facilitating partners in partnerships that span local and national organizations in both the public and private sectors. This helps in promoting equitable participation, both in the pursuit of reducing inequality as the benefits of sustainable development of communities.

Sustainable development requires productive organizations that have a high level of performance regard to economic, social and environmental services that provide to local regions. Organizations also have different strengths, priorities and directions in regard to managing complex production systems, the development of human capacities, equitable distribution of costs and benefits and support sustainable community development.

One of the main economic activities taking place in Sinaloa is fishing, which is the productive activity related to the extraction of marine elements, which involves the extraction of natural resources. Historically, fishing was a major livelihood of mankind, becoming a shifter and productive mobilization that contributes to job creation and the development of areas that have these resources.

The cooperative fishery production is the organization where people come together to engage in fishing, joining forces to improve their production and enhancing the scope of their work. In Sinaloa, this type of organization is emerging as a development alternative for people in rural communities because it offers a way to organize your work.

### **The fishing cooperative, its definition and characteristics**

The definition of cooperative involves the integration of various elements such as the association of individuals, solidarity, mutual interest, self-help, shared effort, among others. For Garcia [1999] in regard to the nature of cooperatives, comparative law has already considered the corporations and civil societies. On the other hand, González [1984] considers that this company is given by the ideas of equity and mutual aid, by eliminating the middleman, seeking nonprofit, obtain and distribute directly and pro rata among the

partners, extra-capitalist benefits, while Rojas [1982] notes that through these organizations is possible to abolish the profit and the wage system, and Gonzalez [1973] indicates that it is not for profit but to ensure social and economic improvement of its partners.

In Mexico, the rule governing the act of cooperatives is the General Law of Cooperative Societies, which represents the New Law published in the Official Journal of the Federation (in Spanish, *Diario Oficial de la Federación*, DOF) on August 3, 1994 and published with the latest reform in the DOF on August 13, 2009. In this Act, the cooperative is defined (Article 2) as a “form of social organization composed of individuals based on common interests and on the principles of solidarity, self-help and mutual aid, in order to meet individual and collective needs, through the economic activities of production, distribution and consumption of goods and services.”

Internationally, the International Cooperative Alliance [2011] notes that the cooperative is an autonomous association of persons united voluntarily to meet their economic, social and cultural needs and aspirations through a common organization jointly owned and democratically controlled.

As the work they do, there are different types of cooperatives: consumption, production and savings and loan. In the case of fisheries cooperatives, they are placed in the group of production cooperatives as they are: “those whose members come together to work together in the production of goods and / or services, providing their personal work, physical or intellectual. Regardless of the type of production that are involved, these companies may store, preserve, transport and market their products “[LGSC, 2009, Article 27] and to operate they only require their legal constitution [LGSC, 2009, Article 31].

### **Sustainable development and its regulation in Mexico**

Regulations, relating to sustainable development in Mexico, have worked to establish a legal framework to coordinate policy issues related to environmental problems and sustainable use of natural resources, considering these standards and their implementation to become mechanisms useful to preserve the environment and natural resources of the country.

Mexico’s constitution establishes environmental dispositions in Article 27 (current legal system), which refers to the conservation of natural resources. Escobar [2010] says that the first environmental legislation in the country was in March 1971 when it enacted the Federal Law to Prevent and Control Environmental Pollution, this Act was operated by the General Health Council, as it had the necessary powers to enact measures to prevent and combat environmental pollution.

Afterwards was published, in 1982, the Federal Law of Environmental Protection. Later, in 1988, was published the General Law of Ecological Balance

and Environmental Protection, in which are included the legal elements of environmental management of pollution of both, the environment and the sustainable use of natural resources, and the establishment of control and security measures in order to guarantee the right of citizens to live in an adequate environment [Escobar, 2008].

Additionally there are other laws that regulate the behavior that affects the environment such as the Wildlife Act, the Forest Act, the National Property Act ordering the Federal Maritime Zone, National Water Act, Act sustainable development of sugarcane, Law of sustainable rural development, climate change General Law, Law for the sustainable use of energy, General Law on Sustainable Fisheries and Aquaculture, among others.

The official Mexican standards (NOM) play a key role on the environment as a tool that allows the jurisdiction to establish environmental requirements, conditions, procedures and permissible limits that have to be observed in the different regions and terrestrial and aquatic ecosystems for the use of natural resources [Flores, 2008].

### **Sustainable development in the fishing cooperative from Sinaloa**

The Council for the Development in Sinaloa [CODESIN, 2011] states that there are three key factors that reveals the social importance of the fisheries sector for the country: 1)Fishing is a food supply, 2)the fisheries sector is a generator of work, 3)fishing is generating revenue for the national economy.

Sinaloa is a state with a strong presence in national production of fish and has thousands of fishermen that depend on the sector, while they have made this fishing into a food supply for the country, and has shown to be an activity generating income for its population.

Historically, Mexico has been in the top spots as fish producer in the world, being the North Pacific fishing region most important in volume and value.

### **Legal framework of fisheries in Mexico**

In Mexico, the development of fishing is regulated by the General Law of Sustainable Fisheries and Aquaculture (LGPAS) 1992 (latest revision published DOF 07/06/2012) and its Regulations. Additionally, various NOM's facilitate the implementation of the Fisheries Act, and specifies the requirements for fisheries (management measures such as the closure, fishing licenses, marine protected areas, restrictions on size and specifications of vessels and equipment, limited entry of new fishermen, total allowable catch quotas, etc.<sup>3</sup>). The Act establishes the National Fisheries Chart as a means of regulating the exploitation of species [Article 32].

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<sup>3</sup> Between 1993 and 2005 there were 31 additional NOM's for sea fishing and 3 more for aquaculture. The National Fisheries Chart is updated frequently, most recently in 2006.

Before this Act<sup>4</sup>, between 1948 and 1992, some high-value species (shrimp, lobster, and abalone) and some government support were reserved for the exclusive use of cooperatives [Juarez, 2007]. As of the 1992 Act, rights were canceled and fishing concessions are granted to private and social agents (duration of 5-20 years and up to 50 years for aquaculture). The OECD [2006] notes that, because of this change, the industry has changed, mainly due to the privatization of the fishing fleet.

For the management of fisheries legislation, it was created the SAGARPA (Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food) from 2001, after the change was made in the Federal Civil Service Act [November 30<sup>th</sup>, 2000] where the modification originated SEMARNAP to SEMARNAT (Secretariat of Environment and Natural Resources) shifting the fisheries subsector to SAGARPA. This was for the purpose of performing a functional management that would promote the national environmental policy.

### **Sinaloa**

Sinaloa is located in the northwest side of the country, with an area of 58,092 km<sup>2</sup>. It has an area of 656 kilometers of coastline in which the fishing industry is developed, which stands for job creation and self-employment, the opportunity to export and foreign exchange as well as regional development factor.

In the area of coastal lagoons, there are 12 bays, 29 wetlands, 2 lakes, a creek and a river mouth. There are 62 fishing communities, recorded about 42,000 workers directly involved in the sector, of these 74% is dedicated to capture fish and aquaculture and the rest to other fisheries activities. There is a large number of vessels of which about 93% are engaged in coastal fisheries and the rest to the fisheries of high seas.

Regarding the fishing cooperative sector, in Sinaloa there are 140 cooperatives with over 4,000 boats, 2,500 permits and 15,000 fishermen. The cooperatives are grouped into more than 10 cooperative federations<sup>5</sup> (in 2000 there were 3 and 2011 are 11).

Fish production is mainly of shrimp, oysters, pau mule, clam, mullet, grouper, sea bass, squid, tuna, kingcroaker, dogfish and shark. The marketing of fishery products is aimed at domestic and international market. Shrimp is the main export species, shipped mainly to the U.S. market.

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<sup>4</sup> Between 1925 and 1986, Mexico enacted seven fishing laws: the first three focused on securing permits and concessions to users, the following two stimulated investment and the remaining two to the technological improvement of the fleet to increase production.

<sup>5</sup> Federation of Cooperatives: An organization in which all, or at least a large part of its members are cooperatives at regional, national or international level and whose purpose is to represent and defend the interests of the cooperatives.

### **The fisheries cooperatives in the center of Sinaloa**

The investigation was placed in 16 cooperatives operating in the center area of Sinaloa, in the fishing camps: Las Aguamitas, Las Arenitas, El Castillo, Altata, El Tetuán, Las Puentes and El Robalar, which concentrate their activity in the capture of various marine species.

This activity is subject to the rules established in the Fisheries Act (LGPAS) and the Regulations of the Fisheries Act. These cooperatives are composed of rural population for whom this activity is their main means of subsistence.

According to interviews with the directors of the cooperative societies, the main activity carried out is the catch of shrimp, crab, clams and some species of scale. Considering the shrimp catch as the most valuable for cooperatives.

Regarding the capture process, the interviewees indicate that to start the fishing activity, first they have to perform rehabilitation on their boats (better known locally as “pangas”), engine repair and rehabilitation and construction of nets and cast nets to be “ready to fish”, the equipment they use are boats with outboard motor with different power 90-115HP.

From the above, it is identified that cooperatives in the center of Sinaloa develop the coastal fisheries in a diversified and characterized way by performing non-mechanized operations, using gear with sustainability criteria, according to the characteristics of the fields.

### **The fishing activity in the cooperative and sustainable development**

Managers of cooperatives comment that shrimp harvesting takes place during periods established by the federal government through the National Commission of Aquaculture and Fisheries (Conapesca), that decision is taken based on the research and technical review by the National Fisheries Institute (Inapesca)<sup>6</sup>.

The main purpose of the establishment of closure is to protect the different species of shrimp of the Pacific Ocean, in the case of Sinaloa, is looking out for crustacean reproduction and recruitment of new generations. The above takes place prohibiting the capture of all species existing of shrimp in marine waters under federal jurisdiction in the Pacific Ocean (including the Gulf of California and estuarine lagoon systems, marshes and bays of the states of Baja California Sur, Sonora, Sinaloa, Nayarit, Jalisco and Colima). Based on studies by Inapesca, the shrimp ban period for the area is the month of March to September each year.

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<sup>6</sup> Conapesca: A SAGARPA administrative entity created in 200, who is responsible for the management, coordination and development of policies regarding the use and sustainable exploitation of fisheries and aquatic resources. The Commission is supported by the Inapesca, which conducts scientific and technological research and provides advice on the preservation, reforestation, promotion, cultivation and development of aquatic species.

According to the interviews, managers of cooperatives indicated that decisions on the closure period in recent years have been without consultation of fishermen, because they usually indicate the start date of capture does not match what they identify depending on the size of the shrimp fishery fields.

The members of the cooperatives indicate that sometimes the start date is already late, due to the shrimp has less time in the bays or estuaries, which causes it to move out to the sea, where large vessels are favored with shrimp size larger than those captured in their communities. In other situations the marine biologist's samples shed little commercial product sizes of shrimp, so several cooperative agreements auto closed down for several days in hopes the species size and scope to develop larger.

For their part, the authorities claim that the agreements to start catching shrimp are formalized with the participation of the productive sectors and coastal seas, with the support technician from Inapesca. This contradicts the information provided by interviewees.

Interviewees added that in the case of large vessels, they generate further damage to the environment as they are entrepreneurs who develop the activity of catching shrimp with minimal care and at the end of the capture period, they leave the area without the minor interest in the conditions they leave the capture spaces, while they stay because it is the place where they live.

The cooperative members say the shrimp catch level has been changing over the years, as the operation has caused them problems in both the shrimp growth and yield of capture and production. The partners say some of the causes of the slow growth of shrimp are due to problems of pollution, disease and exploitation by large companies.

In relation to the actions taken by government agencies to boost the fishing and environmental protection, Conapesca implements various support programs for fishermen, as engine replacement project, voluntary retirement program and shrimp boats national program of inspection and surveillance and satellite monitoring system.

In turn Inapesca has conducted studies through the Regional Centers for Fisheries Research (CRIP) for the production and exploitation of species, which have helped maintain and improve production levels, generating economic and social benefits for the fisheries sector.

Among the proposals that the directors of the cooperative societies pose, is the proposal to Conapesca, about the reseeded of shrimp larvae in the Pacific coast, in order to recover this species that has been lost in the last four or five years due to climate change and other natural and human phenomena that has generated a sharp decline in production of the crustacean.

According to the fishermen, it is necessary to implement a program to prevent the waste of their catch to end up in the sea contaminating and affecting

larval production, but the authorities claim that these actions must be of the producers themselves, as they must worry about keeping marine species. On the other hand the authorities recognize the need to protect the environment, as experience has shown them that otherwise there is a risk of losing their main source of employment and therefore their main source of income.

Even as the biological potential of the region is very high, there are several factors that threaten the area. Some we highlight are the considerable increase of settlers in the region, which leads to over-exploitation of natural resources in the area, the fishing camps and activity has caused a gradual deterioration of the aquatic flora and fauna, fishing involves talking about overfishing, waste, improper fishing techniques, pollution by oil and gas waste and a lack of education on the use of resources.

The eventual character of shrimp fishing in the fishing cooperatives of Sinaloa implies that members face the dilemma of deciding what to do during the six months of closure. A period in which more than 10,000 fishermen become unemployed and in that sense is recognizes that while the capture of this species represents a high value market, currently the revenue generated by the catch levels are not sufficient to meet the needs of families that depend on this activity during the year.

To address this situation, the government offers temporary alternatives as inspector surveillance and other support. In this regard, note that the cooperative's members indicate the failure of the authorities, as they promote support for projects that never receive, and added: "The government announced state support for housing, scholarships, pantries, productive projects, paving, and anything came here", "it was worthless the time in the long lines made to sign in", "we need the federation, the state and municipalities meet temporary employment programs and thus have secure income". They also offer loans to cultivate oysters, but not rely on market research or training, generating unfinished projects.

In short, the problems fisheries cooperatives of Sinaloa face result from overfishing, overcapacity of fishing fleets, increasing the fish population and poaching, the unclear definition of property rights and fisheries management strictly fishing, among others.

### **Conclusions**

Shrimp coastal fisheries is a relevant socioeconomic and cultural activity in the state of Sinaloa; is a vulnerable activity in which you invest in the midst of uncertainty due to the lack of certainty as to whether or not there product during the fishing season. As all fishing activities, it should be practiced responsibly, seeking minors cause environmental damage possible.

The situation of cooperatives and fisheries has now become a social problem that cannot be solved without the participation and involvement of its actors.



It is not easy to solve all the problems in the fisheries sector in the short term, it is necessary to form a common front to convene to boost social and economic development of the fisheries in the state.

It is imminent that the resources included in the National Fisheries Program are assigned under a criterion of social impact for the benefit of the families of the fishing camps as quickly as possible, it is necessary to reconcile the conservation and use of natural resources with social and economic development and thus aspire to achieving the goal of sustainable development.

Society's members expressed concern to the state about the environment and are adopting new methods of care to develop as sustainable cooperatives. Support programs of the federal government to promote cooperative societies comply with the guidelines of care for the environment.

It must admit that in economically backward areas, people tend to over-exploitation natural resources due to lack of production options. So it is urgent that the government in its three instances contributes to the development of specific alternatives for each location, taking innovative ideas and plans for the development of these communities. Rural poverty and the number of families who continue linked to primary production make it necessary to continue to support the industry to improve its productivity and promote sustainability.

Fishing cooperatives and the sector will be developed, as fishermen react to changing business and technical opportunities, on the one hand and legal and environmental constraints on the other.

Inside the importance of fisheries, governments must take into account three basic aspects to resolve the situation: first, the sector is considered a significant source of power; second, it gives employment to a large number of people working directly and indirectly in fisheries and aquaculture and; third, it is an important sector in revenue generation. These aspects seem to fit into two lines mainly corresponding to the economic and sustainable sector, and consequently its profitability and that targets the social development and harmonious fishing communities

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