

A Study of the Reorganization Eco-Systemic in a Cooperative Society of Fishing Production

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ABSTRACT

The present article studies the reorganization that has accepted the Cooperative Society of Fishing Production "The Patole," S.C. of R.L. de C.V. It is stated that as a consequence of the implementation of systems theory, it has enhanced its institutionalization transformation and thus, the accomplishment of its objectives, being a cause of occupation and profit for the cooperative. The principal method employed in this investigation is observing partners, collecting factual data, and utilized with a Likert scale questionnaire. The conclusion is that systems theory is connected to the cooperative to be advantageous in the organizational growth of the social gathering.

KEYWORDS

Fisheries Production Cooperatives, Likert Scale Questionnaire, Organizational Change, Systems Theory

INTRODUCTION

In this twenty-first century businesses must try to maintain positioning in a competitive market. This is due to competition in the sector, rising inputs, climatic change, changing consumer mindset, etc. Companies are economic entities generating jobs and wealth for their owners.

The United Mexican States have a wealth of renewable and nonrenewable natural resources. In the fishing sector companies primarily engaged in the exploitation of marine products are cooperative societies. Cooperatives are supported entities in the cooperative philosophy that seeks the common good of the members, their families and society in general. The fishing sector is part of the productive sectors that support the economy of Mexico. Therefore, cooperatives are important to be sources of employment and income for their partners, families and society in general.

In this study be submitted by a short antecedent, different authors that expose several points of view accord with the importance of fishing farming in such places like Nigeria, Cuba, Colombia, Peru, Japan and Mexico. You will read the importance of aquaculture as an economic and social activity in the country. In addition, the importance of cooperative theory as a source of employment and way to live because cooperatives are regulated by principled that help their members. Likewise, there will be expose the importance of the system theory as support in a correct management performance. Also, you will read the context of development, where the cooperative is, the object of study.

In the same way you will read the methodology used to find the information that proceeded to analyzed and exposed the discoveries. The scale of Likert was the used in this investigation. In addition,

DOI: 10.4018/IJSESD.2020040104

how the cooperative need to obey the law and take care of environment. And last the reflections and recommendations with the limitations of the study, potential problems to resolve and future research founded in this investigation. The purpose of this study is to help the cooperatives and any company to apply the system theory and sustainable environment.

The central research questions are:

- A. The cooperative maintains its productivity even though with being in the protected natural area The Meseta of Cacaxtla?
- B. The Systems Theory and the sustainable development contribute in the effectiveness and efficiency of the cooperative?

Cooperative societies to be part of the fisheries sector which in turn is part of the Mexican economy are systems. That is, the cooperative is a system within several other systems work together in social and economic benefit of the country. Herein lays the importance of the study of systems thinking in the Cooperative Society of Fishing Production “The Patole,” S.C. of R.L. de C.V.

BACKGROUND OF THE PROBLEM

The current global environment is extremely competitive. Countries should support businesses to continue working in the market. Similarly, countries should use natural resources wisely so that future generations do not lack of these resources. Although the persons had been contaminated, abused and behaved illegally in the fishing activity. Derived these facts the capture of marine products had been dropping at an alarming rate. The consequences are in a negative way in food security, economic development and welfare state of the world population. This is the reason why there is a need to recover the sea depleted stocks and maintain the healthy marine population. In this point lies the importance of fish farming as an economic and social activity.

The fish farming has an activity it is showing in the 2500 century B.C. Egyptian temples in where it can be seen an artificial pond of fishes named tilapias. In the 1400 century B.C. in the region Indo-Pacific had laws that protected fish men against thieves, at the same time Japanese, Greeks and romans cultivated oysters. In the 475 century Fan Lei a Chinese politician converted a fish farmer wrote a treaty about fish farming named Classic of fish culture. In the 14th century the trout was fish farming in France by a monk Don Pinchot. After centuries of little use of fish farming in the 17th century Netherlands restarted fish farming activities. In the 18th century beginning reproduction of trout in artificial ponds and at the end of the 19th century started the first integral farming of trout. The first fish farming of crustaceans was in the year of 1933 for the Japanese Fujinaga worked with the prawn named *Paenus japonicus* (Corral, 2000).

In the last three decades fish farming had registered a meaningful and fast development over food producers and become in a big and vital industry. The development of fish farming in the entire world means that its influence contributes in the sustenance and generation of income in the world economic. Also it becomes a source of income for persons that work in the sea production sector. Other positive effect is the restocking of overexploit marine creatures that had diminished its population (FAO, 2011).

The study made Barguma K, A.A Ndaghu. (2014) realized in Fish Farmers in Girei, Yola North and Yola South Local Government Areas, Adamawa State, Nigeria concluded that fish farmers were principal marry men, with a big family and less than 10 years of experience. They needed more information about fish farming improvements. This exposes the necessity of more information and capacitation for part of the government to make better the fish farming process in Nigeria.

The Cuban fish farming made up during decades development programs that pretended increased their productivity levels. In the last years the government proposes as a challenge develops fish

farming applied modern discipline technology of farming as well as revive the fish industry and increase the offer, variety and quality of the products in the domestic market. The study identifies that are necessary priority actions to manage the fish farming development and sustainability renovation of technique productive infrastructure, strategic orientation and diversification of the fish farming productions. (Ramírez, Fernández, Pedro, Enrique, Veloz, Atencio, Ernesto, Evaristo, Miranda, Quiroga, Ricardo, 2018).

The Autoridad Nacional de Acuicultura y Pesca (AUNAP) in Colombia (2013) explains that are marked differences between industrial marine fisheries and artisanal inland. The industrial marine fisheries basically it has concentrated in two species: tuna and shrimp, both products are intended almost exclusively in the international market. The development of transformation process in the domestic market is quite precarious because of the high cost of operation. The artisanal fisheries focus in the capture of shrimp in shallow waters and waters near the coast and it is exclusive for the domestic market.

The principal interaction between fishing and fish farming in Colombia has been given through restocking programs made in public entities that seek to increase the fishing offer in continental waters to increase food security and quality of life of the fishermen. Additionally, some private companies that exploit oil and built hydroelectric power station must make repopulation of marine creatures in the agreement of the environmental authorities ordered as measures to mitigate the negative impact that their activities taking place in the environment.

Álvarez, Tello, Tello, and Campos (2008) realized a study named: Strategy of development of fish farming in the region of Loreto, this document proposed to secure the sustainability economic, social and environmental in the fish farming activity in the region of Loreto, Peru to go through developed a culture of conservation of natural resources and environment. Also, the positive improvement impact of the activities and give priority to the requirements in environment and social responsibility of the international market. The environment, working and investment regulations need to be in agreement. The objectives to obtain this sustainability are: Minimize and control the negative impact of different fish farming practices in environment, develop and image of prestige and care of conservation of natural resources and strengthen and institutionalize the fish farming community development to increase the investment, Eco efficiency and labor justice.

The fish farming or aquaculture has a well-established industry in Japan because its territory is small, and the Japanese eat a lot of marine products. This generates large amounts of wastes that harm the environment that is why the government establishes in 1999 the Law to Ensure Sustainable Aquaculture Production. The purpose of the law is to establish and promote the improvement of the ecological processes in the fish farming and prevent diseases among the animals. This law is made up of two parts: The Aquaculture Ground Improvement Program and the prevention the spread of specific contagious diseases. The Japanese government is concerned that they need to protect the environment. Even so it is necessary to continue investigating how to reduce the contaminating and take care of the environment (Hisashi, 2003).

The United Mexican States have a vast amount of resources that should use properly the good of its citizens. Mexico has a land area of 1, 964.375 square kilometers, corresponding 1, 959.248 continental surface and 5,127 to islands. The extent of coastal is 11,122 square kilometers (Schettino, 2002). Marine species that inhabit the coasts are: anchovy, hake, squid, red crab, red snapper, grouper, sierra, sardines, tuna and shrimp (Anda, 2003.). The country's natural resources are outstanding and if properly exploited food and generate wealth for the population.

In Mexico fish farming activities originate in the decade of 1960th in the Papaloapan Veracruz basin with the introduction of tilapia fish. In the decade of 1980th began the production of shrimp in the Pacific Northwest. The fish farming in grow in shrimp with the fishes: tilapia, trout, catfish and goldfish. The natural resources of the country put in a strategic position to become a world market leader in fish farming production in fresh and salt water. To achieve that objective the nation, need to develop productive infrastructure, proper legislation, scientific and technological research,

technology transfer and financing risk management. With that support the Mexican fish farming will be producing food, economic growth and employment creation. And using sustainable the natural resources as water. (Platas Rosado, Diego E.; Vilaboa Arroniz, Julio, 2014).

The state of Sinaloa is one of the leading producers of white shrimp (*Penaeus vannamei*). In 2014, according to National Institute of Statistics and Geography (INEGI) (INEGI: 2015) economic units in the country engaged in fishing were 4, 230.745. Also, it argues that farmed shrimp was 7, 447.104 tons representing \$ 507, 716.640 (INEGI: 2014). The shrimp was captured in estuaries 940.848 tons representing \$ 62, 575.089. Service Information Agrifood and Fisheries (SIAP) reports in its monthly Bulletins the fish production by State in 2015. Production in the country was 26,617.59 tons and in the state of Sinaloa was 9295.26 (SIAP, 2016). This information shows the importance of the fisheries sector, especially shrimp in Mexico. The main operators of crustacean are cooperatives.

Cooperatives face several challenges to continue working. To name a few are the climatic change, competition, new market demands and environmental protection. It is seen as cooperatives are part of the Mexican and global economic system. This is the case of this article focuses on the case of the Cooperative Society of Fishing Production "The Patole," S.C. of R.L. de C.V. The Patole is a system that is within the economic system of the nation which in turn is part of a larger system the global economic system.

DELIMITATION OF THE PROBLEM

This research is an investigation that was necessary to explain how organizational change was necessary at the Cooperative Society of Fishing Production "The Patole," S.C. of R.L. de C.V. in order to attain greater development in production volumes and growth. Plus it is affecting the entity, because a low impact business development in the social context where it is located. Low productivity affects employment generation causing no positive impact on fishing activity and the regional, state and national economy.

Organizational improvement in the cooperative system is crucial to the future of it. Cooperatives are founded figures that promote values such as solidarity and collective benefit. The cooperative philosophy is aimed at obtaining common good that benefits all members. In today's competitive environment, it requires that cooperatives continue to be laboring jobs for partners within them. Such is the case study; the Patole is the source of employment for eighteen members and their families.

This study is based on a diagnosis that detected an organizational problem in the cooperative society that poses systemic model implementation to improve the functioning of the Cooperative Society of Fishing Production the Patole S.C. of R. L. of C. V. For the entity reconvenes philosophical principles of mutual assistance and common welfare and generate benefits in the members, their families and society in general.

HISTORICAL, LEGAL AND THEORETICAL BACKGROUND

The cooperative has its origins in 1844 when Rochdale cooperative, located in the county of Lancashire was founded. It consisted of workers who were weaving flannel together to purchase a cheaper price staple (Morgado, 2006). In the late nineteenth century European immigrants brought the cooperative in southern Brazil, Uruguay and Argentina.

In the United Mexican States cooperatives were promoted in 1865 by a group of anarcho-sindicalist leaders. However, it would be until the 1930s when the movement would take shape under the government of President Lazaro Cardenas del Rio. The president supports agrarian reform based on cooperatives (Arango. 2005). Over the decades, cooperatives continued their work consumption and production benefiting its members and society in general.

However, the change in society in the last decade of the twentieth century showed that an update was needed in legislation. On August 3, 1994 President Carlos Salinas de Gortari reformed the law

and denominating General Law of Cooperative Societies (LGSC), the last update was on 13 August 2009. There is also another law regulating cooperatives in Latin America called Framework Law for Cooperatives in Latin America (LMCAL) that emerged in 1987 and was renovated in 2009. Both laws are in harmony.

The GLCC defines cooperative in its second article as a form of social organization composed of individuals based on common interests and the principles of solidarity, self-help and mutual aid, in order to meet individual and collective needs, through carrying out economic activities of production, distribution and consumption of goods and services (Chamber of Deputies 2009, p. 1).

While LMCAL in his third article defines cooperative as associations of persons united voluntarily to meet their common economic, social and cultural needs through a company owned jointly and managed democratically. They are private legal entities of social interest. The philosophy of mutual help and common benefit of the members of the cooperative (Mariño, 2009, p. 3) is observed. In both laws cooperative principles are presented. In the LGSC in article six is exposed:

1. Freedom of association and voluntary retirement of partners
2. Democratic administration
3. III Limitation of interest to some partners' contributions will be agreed if so
4. Distribution of income in proportion to the participation of the partners
5. Promoting cooperative education and education in the solidarity economy
6. Participation in cooperative integration
7. Respect the individual right of members to belong to any political party or religious association
8. Promotion of ecological culture (Chamber of Deputies, 2009, p. 2).

While LMAL partnership presents it in his article four:

1. voluntary and open membership
2. Democratic management by partners
3. Economic participation of the partners
4. Autonomy and independence
5. Education, training and information
6. Cooperation between cooperatives
7. Concern for the community (Mariño, 2009, p. 4)

The GLCC and MAL support the cooperative philosophy and support democracy, freedom and equality of each of its partners. Also, education and training, this is done through cooperative education in which the partners motivate children of cooperative members and children of the community to study. Promoting ecological culture is extremely important especially in the issue of climate change that has occurred in recent decades.

As characteristics of cooperatives noted that partners are unlimited and can vary in number, their duration is indefinite, its capital is variable and unlimited, the organization presents political, racial and religious independence, the partners have equal rights and obligations, each partner is entitled to one vote regardless of their contributions and finally the social reserves are non-distributable.

In the LMCAL acts performed by cooperatives are regulated by the cooperative law. Cooperatives can serve external people from them always and when not on more favorable terms that partners and obtained surplus be devoted to cooperative education or reserve fund. Cooperatives can occur in various ways, consumers, associated and mixed without the prevalence of any criteria of classification and in any branch of the economy (Mariño, 2009, pp. 4-5) work.

Cooperatives are systems composed of partners who perform work for the benefit of themselves and their families. Therefore, the general systems theory will be discussed. Aristotle was the first

person to mention systems theory by stating that reality is addressed in general and not studying their parts separately to know their entirety. René Descartes in his philosophical book called *Discourse on Method* for conducting one's reason well and seek truth in science emphasizes the study of phenomena subdividing it into systems to examine the parties and relations between them (Latorre, 1996).

System is defined as a set of interrelated parts to achieve certain goals (Fallas, 1998, p. 36). Von Bertalanffy (1989) defines it as a complex organization composed of a combination of parts that constitute an intricate or unitary whole. The Patole cooperative society is a system composed of people, partners who in turn are systems. Therefore, this research sought the views of the eighteen cooperators to detect the problem and implement organizational systems theory in the organization.

The systemic model is an integrated model, consisting of parts that come together to achieve organizational objectives. Administrators try to convey to each subordinate how important they are for the system, so the administrator role transform itself to facilitate the achievement of the subordinate through various actions such as training in skills and appropriate behavior, concern true in relationships between people and feedback.

By the side of employees, they respond with mutual recognition of obligations to the cooperative organization. Employees go further than the self-discipline to achieve self-motivation in taking responsibility for their own goals and actions. The model provides individuals to achieve meeting a wide range of higher order needs, such as status, self-esteem, autonomy and personal fulfillment, which can result in the employee passion and commitment to the goals of the organization. The features of this model are extended in the following section (Tirso, 2008, pp. 132, 133, 135, 136).

The general systems theory arises from two approaches. The first is to observe the empirical universe and choose certain general phenomena to try to build a theoretical model that is relevant. Consider all systems (phenomena) seeking to reduce it to a more reasonable size. It is observed in the study on population for a given object of study, and researchers reduce the sample size, which is representative and possess the required characteristics.

The second approach sorts hierarchical empirical fields according to the complexity of the organization under review. This approach is more systematic and develops a system within a system. If a large organization is studied, there are sought departments as systems within the main system. In this way, it takes an order and the hierarchy is considered (Johansen, 2004). This article analyzes a case study and for this reason applies the second approach of systems theory.

In turn, there are two kinds of systems: Open systems and closed systems. In closed systems, nothing comes in and nothing goes into them, everything happens within the system and communication with the outside is zero. Open systems require their environment to be. Examples of open systems are biological and social systems. Regarding the Ferguson (1994), open systems states:

"Some natural ways are open systems, that is, are involved in a continuous exchange of energy with the environment. A seed, a fertilized egg, a living being, are all open systems. There are also open systems manmade. Prigogine cites the example of a city: absorbs energy from the surrounding area (electricity, raw materials), transforms it into the factories, and returned to the environment. "

For Goldfeder (2000, p. 145), an open system can only exist for the exchange of materials, information and energy with their environment, i.e., it performs the task of importing materials and transforms them to perform their internal maintenance and export the rest. Open systems are registered within a larger system in which society must constantly relate to subsist. Rodriguez and Arnold (1990: 40) indicate that systems are defined by a dynamic relationship between inputs (inputs) and outputs (outputs). The same system is responsible for processing the materials from the environment, for which have internal structure and organization.

Open systems require a balance between what they need to survive and what they cause. The inputs are the input elements whose form is money, materials, people, products, services and political and economic forces of the larger system. The outputs are what produce systems such as roses from a bush, the fruits of the trees, a software of a computer company, i.e., elements that can be inputs to other systems because all systems are interrelated between them to be part of a larger system.

Open systems have nine features mentioned below:

1. First. Energy imports. Companies are not self-sufficient for that reason need inputs from the medium or supra system.
2. Second. Processing. The system processes the inputs doing work.
3. Third. The product. It is the result of the transformation of inputs. The product is exported to supra system.
4. Four. Cyclic operation. The continued cycle of exchange between the supra system and the system happens when the system continues to send products that serve as inputs to other systems and vice versa.
5. Five. Negative entropy. It is the destructive energy of the system, controlled by importing more energy than necessary in order to store the surplus.
6. Six. Inputs are information, negative feedback and the coding process. The information received to the system helps to understand the supra system and how their actions affect the environment. Negative information announces its faults to correct them. Using coding system will accept or reject the information relevant and necessary for its operation.
7. Seven. The system features a stable and constant state supported by entries selected for operation inputs.
8. Eight. Differentiation. Systems have specific characteristics that make it different from each other.
9. Nine. Equal finality. The system can achieve the ultimate state through different paths and initial states (Hernández, 2002, p. 106).

The Cooperative Society of Fishing Production “The Patole,” S.C. of R.L. de C.V., is an open system that performs internal processes of transformation of its product. And it needs the external systems to perform its duties; it could not be closed by requiring others to its proper functioning system.

The general theory of systems avoids duplication of efforts that help the Patole organizational development to be a benefit to partners, its families and society in general (Von Bertalanffy, 1989). The cooperative theory and systems theory are closely related; while the former seeks the common good of the partners that make up the cooperative the second analyzes the components of the company as a whole. The Patole is studied as an organization of people who are themselves systems. It is expected that following the example of the Patole other relevant sinaloenses cooperatives made organizational changes to increase their efficiency and their processes and obtain profits for their cooperative members, their families and society in general.

THE CONTEXTUAL FRAMEWORK PATOLE

The Cooperative Society of Fishing Production S.C. the Patole RL de CV was founded in the late 1970s and derived from a draft collective social benefit, Mr. José Natividad Torres Salazar advised by Mr. Enrique Echeagaray Osuna, joined a group of people of Piaxtla de Abajo, San Ignacio, Sinaloa to form a cooperative society to come to jointly support the economy of the participants. The Cooperative Society of Fishing Production “The Patole,” S. C. de R.L. of C.V. it was founded in order to help the inhabitants of the community of “Lomas del Mar Piaxtla” San Ignacio, Sinaloa to generate a source of employment because farming was insufficient to meet the needs of their families. This is because the agricultural activity was insufficient to continue being the source of family income.

On June 27, 1980 after completing legal formalities the company registration was obtained. The cooperative obtained the authorization to operate in protected waters, shrimp production, flake and oysters, as well as fishing off the coast of scale and shark. The corporate purpose of the cooperative is to extract, capture and fishing collectively in national and inland waters; as well as conducting

sales, transportation and industrialization of the products obtained and aquaculture production of all kinds of shellfish, fish and crustaceans.

The mission of the cooperative is to produce shrimp aquaculture of excellent quality for local, national and international markets, seeking higher levels of profitability, with the highest overall development of the resources of society and especially the human resource and sustainable care of natural resources. Its vision is: The Patole Cooperative Society is an organization that develops a productive activity in the various economic and social fields, with proper management of resources and an efficient and competitive administration.

The cooperative has permission granted by the appropriate authorities of the Ministry of Environment and Natural Resources (SEMARNAT), the National Commission of Aquaculture and Fisheries (CONAPESCA) and the Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA). The above government organizations are highly related to the primary sector supra systems fishing activity, Mexican economic system and ecological system.

The Patole has authorized areas that are marshlands called the Tazajal, the Patole, Banderillas and Los Muertos. The importance of Tazajal lies in direct communication that the estuary system has with the sea throughout the year. Its flooded area is three hundred hectares in the rainy season, in low-water period is about fifty hectares. The estuary the Tazajal like the fishing camp is located within the boundaries of the municipalities of San Ignacio and Mazatlan. Then in Figure number 1 below a photo of the estuary the Tazajal is shown.

Access by the international road is at number fifteen to forty-eight kilometers from the port of Mazatlan. The route has thirty-six kilometers of paved road and dirt road twelve kilometers from 1.5 kilometers away from the town of Mármol, Sinaloa. On the road Maxipista at twenty kilometers from Mazatlan to Culiacan and about ten kilometers of dirt road, as it is shown below in figure two.

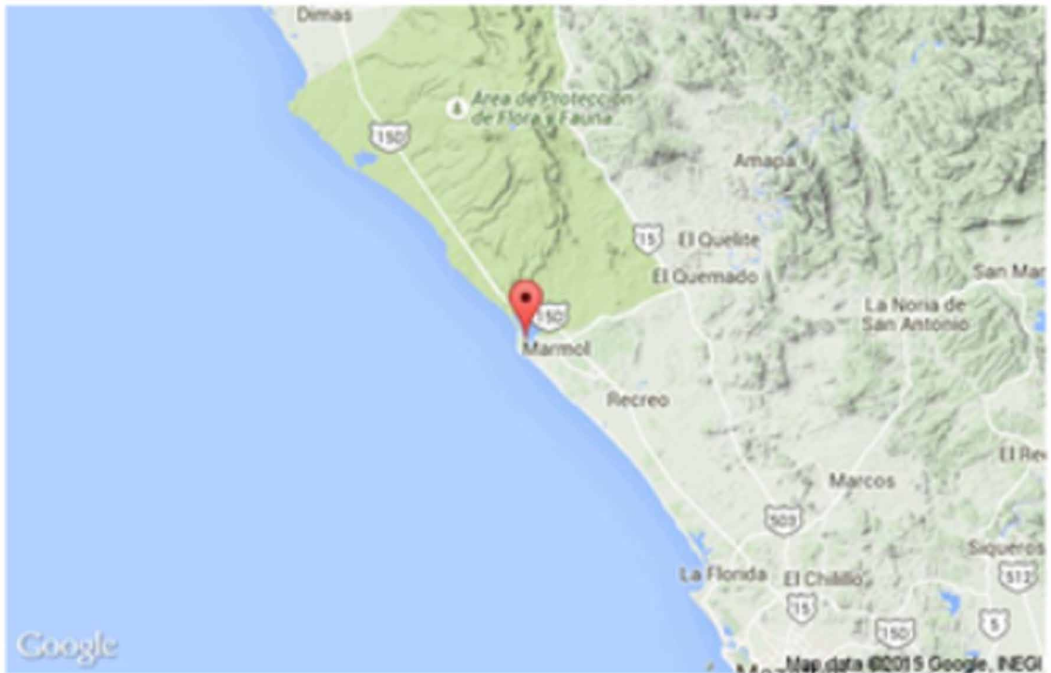
The Patole is a system composed of sub systems that are the board of directors, the production manager, and the administrator. From the administrator depend on the auxiliary administrative sub systems. While from the production manager depend the accounting and administrative assistant subsystems, wages, cleaning and guard also depend on the systems. The organization is observed in Figure 3. A brief description of the positions was made.

1. **Production Manager:** It is responsible for the supervision and control of workers responsible for the production process. The manager must make periodic reports to the Assembly members.

Figure 1. The fishing camp “The Tazajal” (Source: Internal information of the Cooperative Society of Fishing Production “The Patole”)



Figure 2. Location of the Cooperative Society “The Patole” with respect to the surrounding villages and the road network (Source: Google maps)



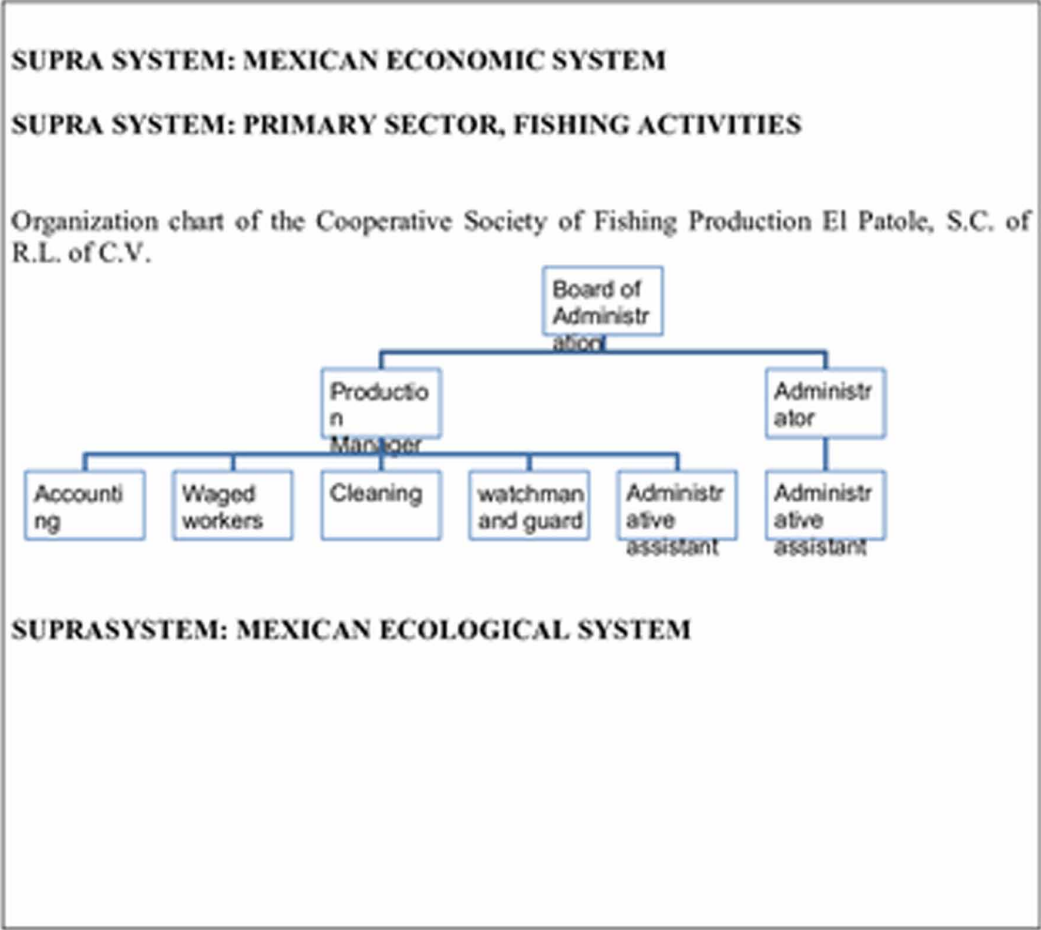
2. Administrator: The person who takes control and makes decisions on minor issues in which it is not necessary to call the board. It is supported by an administrative assistant, who helps him in the record of the documents required for their duties.
3. Accounting: A person who takes control of accounting and financial records. Accounting manager must prepare monthly reports for the Production Manager.
4. Administrative Assistant. The person to support the production manager in administrative activities that have to do with receiving and selling the product.
5. Cleaning: It will be the person in charge of the cleanup of the plant.
6. Waged workers: Individuals who are responsible for monitoring the crop to harvest the shellfish. Wages serve the product to be ready for sale.
7. Watchman. The person responsible for protecting the safety of the place.

The structure discussed above performs the process of functioning of human resources as follows: The board of directors is the supreme body appointed by the assembly of members and makes decisions based on the reports from the production manager and administrator. The production manager is responsible for taking decisions and the entire production process. Meanwhile the administrator makes minor decisions based on administrative documentation for the best administrative operation of the cooperative.

The production manager and administrator meet to present their reports to the board of directors, who is making the major decisions that benefit the purpose and functioning of society. From the production manager depends hierarchically an administrative assistant and a counter on the first level and second level wages, a night watchman and a person responsible for grooming and cleaning.

The administrative assistant and accountant work together to present a report control of accounting records, financial and receipt and sale of the product is presented. This is done in order

Figure 3. The Cooperative Society of fishing production “The Patole,” S.C. of R.L. de C.V. as a system within the Supra systems: Mexican economic system, primary sector, fishing activity and Mexican ecological system (Source: Based on data provided by the Cooperative Society of Fishing Production “The Patole,” S.C. of R.L. de C.)



that the production manager can make the appropriate decisions to benefit the Patole. Wages, the night watchman and cleaning interact in the process of cultivation until harvest. Workers on wages serve the product to be ready for sale. While the watchman guards the safety of people who work, cleaning, and maintain toilet facilities. It can be seen that the cooperative turn, society is a system in Mexico’s economic supra system in the primary industry supra system fishing activity and the Mexican ecological supra system, as it is shown below in figure three.

It can be seen that the cooperative turn, society is a system in Mexico’s economic supra system in the primary industry supra system fishing activity and the Mexican ecological supra system, as it is shown in Figure 3. Earlier in the figure number 3 are seen how supra systems relate to the cooperative that is itself a system. From this fact lies the importance of the cooperative, being evident for several reasons:

1. It is a source of employment and income for partners and their families.
2. Generates indirect employment for temporary contracts that are required in certain specific times of the year such as preparation, production, lifting the harvest and marketing.

3. Drives the economy of the town.
4. Influences the primary sector fishing activity.
5. Influences the Mexican economic system.
6. Influences the Mexican ecological system.

The labor process of human resources in the structure of the Cooperative Society of Fishing Production the Patole, S.C. of R.L. de C.V. interacts with supra systems: Mexican economic system, primary sector, Mexican fishing activity and ecological system. These three supra systems cause uncertainty and complexity in the cooperative. It can be cited economic problems as the devaluation of the peso against the dollar affects purchasing inputs of society.

The primary sector fishing activity has its own characteristics dominated public by policy and market requirements, may be increased by consumption of shellfish or implementing regulations that protect the environment. This exposes the relationship between the primary sector of fishing activity and the Mexican ecological system in which the government issues the regulations required for the protection and proper exploitation of the environment. The decisions made by the manager and the production manager affect the board and therefore the functioning of society. Just the same way decisions made by administrator, the production manager and the board of directors influences fishing supra systems: Mexican economic system, primary sector activity and Mexican ecological system.

In this fact it is clearly observed the interactions between internal variables of the process that makes the structure of human resources of the cooperative and the uncertainty and complexity of the supra systems in which is located the Patole. Here lies the importance of the implementation of the systemic model in society, just because all human resources of the cooperative function as a single system can solve any problems that arise in the supra systems and take appropriate action measures.

The cooperative is a theory that seeks the common good of the people while the general systems theory seeks the relationship between different systems. The Patole complies with the cooperative theory and general systems theory, being an integrated supra systems mentioned above which are governed by the guidelines established by the philosophy of the cooperative system. The change in the economy and society has led to the cooperative facing competition from globalization, implementation of new technologies and the protection of the environment. For this reason, it is necessary to detect any organizational problem so that can overcome external difficulties that arise and remain productive and competitive in the market.

METHOD

This article is a report of an investigation considered it is a process that, by applying the scientific method seeks to obtain relevant and reliable information to understand, verify, correct or apply knowledge (Tamayo, 2004, p. 37). All scientific research has to be sustained by serious work on a methodology that must submit a design or shape how it should be performed. It requires a design that marks a course of action, the nature of the research, study subjects, how to choose these subjects and the methodology to be used (Nieto, 2010). The researcher needs to point out the details of his study in order to shed correct and proper results. It is worth mentioning that there are different types of research to suit the needs of the various studies.

The methods used in obtaining the information were observing partners, gathering factual information and indicators and supported by the application, a Likert scale questionnaire. Observation for Hernandez (2010, p. 260) is an accounting record of observable situations and using a set of categories and subcategories behaviors. Observation was used to analyze the relationships between partners to identify organizational problems.

The documentary research was used to analyze internal documents to see if there have been profits in the Patole. Collection or analysis of secondary data is defined by Gilbert (1997) as the study of the original data collected by other researchers or institutions generally statistical in nature

such as censuses and official government statistics. Being serious documents are reliable for use. In the same way any document prepared by a researcher is considered as secondary data, i.e. files are derived from previous research and may be useful for future research.

The third method is to apply a questionnaire to the partners, based on the Likert scale. Abascal (2009) mentions that the questionnaire performs the functions of the specific questions manage to move the objective of the investigation, the information obtained is homogenized because all respondents respond to the same formulated items, with proper design helps provide information and aid to effective treatment of the data collected.

Being standardized questionnaire helps in the statistical treatment of information obtained to be useful for research. Hernandez (2010) cites that was developed by Rensis Likert and consists of a set of five items presented as statements where it is required the participant to choose one of the items. Each item has a numerical value so that the participant gets a score that adds up until it is reached a final score. The design of the scale Likert manages to be easy to capture information in computer systems and being five items is practical to respond by study subjects.

The Likert scale is constructed with statements that qualify the study object, each of the items provides a punctuation that is summed to obtain the result of all the affirmations that integrated the measuring instrument. These affirmations can have a direction which is important in the time to codify the information. These directions are from positive favorable or negative unfavorable. The positive direction happens when the object is qualified more in the positive direction of the affirmations. The negative direction happens when the object is qualified more in the negative direction of the affirmations. It is an instrument that it is easy to understand, to made and applies (Malhotra, 2004).

The three methods relate to each other to achieve the desired research results. Not only applicable to the Patole but also to other cooperatives in the area and the state of Sinaloa. This is in order to maintain the cooperative democratic support and the relationship between the three supra systems in which the cooperative is related. The questionnaire applied to the cooperative members consisted of five set of values: Totally completely agree, agree, more or less agree, out of keeping and strongly disagree.

The items are divided in two positive, two negative and one neutral. The eleven questions were answered with one of the five values; the information had been analyzed and obtained the conclusions of the study. Prepared on the basis the information provided for the questionnaire based on the Likert scale that the cooperative members answered together. The questions were focus on the natural protected area called the Meseta of Cacaxtla and their benefit in the cooperative activities, their obedience to law, their take care correctly of environment, the modification of law did not affect negative the production of the cooperative, the cooperative produces quality shrimp even the economic changes, the cooperative continues being efficient and effective in their productions process.

ANALYSIS OF RESULTS

Taking up the point made by the cooperative theory, the partners have equalities and everyone works together for the common good. Systems theory supports the point that a system is composed of several parts that interact with each other for the common goal of the organization. Both theories apply to the Cooperative Society of Fishing Production "The Patole," S.C. of R.L. de C.V.

The successful implementation of the systemic model in the company depends on organizational design, the process of deciding on how to create, use and select the right combination of structures, control system and culture of the organization. Companies require supervise and monitor the design process to achieve outperformance (Hill and Jones, 2009, pp. 403, 437).

According to the cooperative society studied, it is observed:

- A. An initial resistance to the application of the systemic model. This fact because the partners were pleased with the performance of the leader. However, due to the current needs cooperators understood that the application of systems theory in the Patole was necessary.

- B. Incentives to motivate members to work hard were implemented.
- C. Feedback from partners to management of the cooperative was implemented.
- D. Changes in the organizational structure and delegation of functions by the leader to the other partners were implemented.
- E. Administrative controls are performed more precisely and strictly. Constant evaluation is performed so that the objectives are met.
- F. The realization of agreements with buyers, in which they carry their refrigerated trucks to the fishing field so that the product remains fresh and frozen.

In systemic approach it favors the cooperative because it establishes the conditions for participation in projects of external financing, provides reliable and timely information of the activities undertaken, and reduces costs and unnecessary expenses in establishing more efficient processes. Therefore, it manages the cooperative production processes can be more efficient. This coincides with the data provided by the partners in their questionnaires and comments.

It is necessary that the people who work and live near the areas dedicated to fish farming get integrated to improve their life quality. The government is forced to advise the persons to become more efficient in their labor because the protected natural areas required be restored and preserved. The sustainable development is a process through which seeks to improve the quality of life of the society in the environment, economic and social impact. Also preserve the ecological balance to approve the natural resources and keep for the next generations. This requirement limits the activities that the cooperatives can do because they need to taking care all the flora and fauna in their environment.

Also, their production process is required to be ecofriendly and maintain efficiency and effectiveness in the product. The consumers do not like a product that not is fresh because this is affect their taste. The costumers are more and more demanding, and the competition is tough, that is why the cooperative need to take care of the environment and maintain the quality of their products. These affirmations made that the cooperative give though and realized the importance of the implementation of the systemic model and improve the environmental care.

REFLECTIONS AND RECOMMENDATIONS

This article is based on research and supported by the cooperative theory and systems theory has the following reflections and recommendations. The same reflections and recommendations can be abided by the any cooperative and any other organization wishing to implement the systemic model for more efficient activities.

The limitations of this investigation were on time, territory and resources. The first one refers the period of time that covers the study. The second is the geographical demarcation being studied. The third are the financial resources to obtain data for the investigation. These three elements impact directly on the limitation of the investigation, they have to be considered because they may affect the results of the study. The present study has limitations: It is a case study so there is needed to realize several cases that coincide to be significant. It takes a lot of time to read the documents of the cooperative and the law that affect them. And this investigation was done with proper resources that of course had a limit of money to expend.

The potential problems found in this investigation were the resistance of the cooperatives to adapt to the new changes of society, the increase of laws to protect environment, the ignorance of the law because it will be new that they will need capacitation, they need more support of the government, the competition national and international, the economic changes, the consumer more and more demanding in quality of the product and the climate change that become sometimes a unpredictability weather.

The Cooperative Society of Fishing Production “The Patole,” S.C. of R.L. de C.V. has implemented the systemic model based on:

1. The diversification of white shrimp supply and incorporating added value with biotechnological processes.
2. The cooperative philosophy based on mutual support, solidarity and cooperation among its members.
3. The objectives, mission and vision that support the daily work of the cooperative.
4. The correct and timely integration of partners to productive activities required in the process for obtaining white shrimp.
5. The feedback and relevant organizational restructuring which improved the efficiency of society.
6. The hiring of external personnel in strictly cases of administrative, accounting, legal advice, quality control and specialized care product activities, as can be the case that diseases are detected.

The above comments on the relevant recommendations derived:

1. The continued study of the Cooperative Society of Fishing Production “The Patole,” S.C. of R.L. de C.V. in order to detect problems that afflict and may interfere with proper development and productivity.
2. Continue to involve partners in all activities that could affect the Patole. So that they can make appropriate decisions when problems arise in the supra systems: Mexican economic system, primary sector fishing activity and Mexican ecological system, affecting with its uncertainty and complexity the direct activities of the cooperative manner.
3. Conducting similar studies with this article in other cooperative societies in order to benefit the fishing sector.
4. Recommend among companies in general implementation of the systemic model in its functions.

It is observed the importance and benefits of the implementation of the ecosystem approach Cooperative Fish Production “The Patole” is observed, S.C. of R.L. de C.V. because the human resources that make up the entity in the process of its structure are active and make decisions that affect the organization. However, these decisions are influenced by interaction with supra systems: Mexican economic system, primary sector fishing activity and Mexican ecological system.

The Patole has internal interactions in the process of human resource structure supported through systems theory. Similarly, it maintains interactions among the three supra systems. It is therefore important to maintain a systemic organizational culture between the partners so that they can solve any problems that may affect the entity and remain competitive in the market for white shrimp.

This study is beneficial for the company as it can be for the other belonging to the fishing sector. As previously discussed, the cooperatives are a source of employment and income for cooperative members, their families, and the region where the cooperative and society in general is located. All of these are as a great system.

The Future researches derived of this investigation are:

1. The quality and productivity in the cooperative society.
2. The control and management in the cooperative society.
3. The environmental management and implementation of new technologies in the cooperative society.
4. The competitiveness and the new technologies in the cooperative society.
5. The competitive strategic and the productivity in the cooperative society.
6. The business growth and the competitive in the cooperative society.
7. The innovation and productivity in the cooperative society.
8. The new technologies and sustainable development.
9. The competitive strategic and sustainable development.

REFERENCES

- Abascal, F.E. & Grande, E.I. (2009). *Fundamentos y técnicas de investigación comercial*. Madrid, España. Escuela Superior de Gestión Comercial y Marketing (ESIC).
- Álvarez, J., Tello, S., Tello, H., & Campos, L. (2008). *Estrategia de desarrollo de la acuicultura en la región de Loreto*. Ministerio de Comercio Exterior y Turismo Perú.
- Anda, G. C. (2003). *Entorno socioeconómico de México*. México: D.F. Limusa Noriega Editores.
- Arango, J. M. (2005). *Manual de cooperativismo y economía solidaria*. Medellín, Colombia: Universidad Cooperativa de Colombia.
- Araya, V. H. F. (1998). *Evaluación e implantación de un sistema de calidad en instituciones educativas*. EUNED.
- Autoridad Nacional de Acuicultura y Pesca (AUNAP). (2013). *Diagnóstico del estado de la acuicultura en Colombia*.
- Barguma K, A.A Ndaghu. (2014). Information Accessibility among Fish Farmers in Girei, Yola North and Yola South Local Government Areas, Adamawa State, Nigeria. *ARPJ Journal of Science and Technology*, 4(8).
- Corral, M. L., Grizel, H., Montes, J., & Polanco, E. (2000). *La Acuicultura: Biología, regulación, fomento, nuevas tendencias y estrategia comercial. Tomo I Análisis del desarrollo de los cultivos: medio, agua y especies*. Madrid, España: Fundación Alfonso Martín Escudero.
- de Diputados, C. (Ed.). (2009). *Ley General de Sociedades Cooperativas*. Retrieved from <http://www.diputados.gob.mx/LeyesBiblio/>
- Ferguson, M. (1994). *La conspiración de acuario*. Madrid, España: Editorial América Ibérica.
- Gilbert, C.J. (1997). *Introducción a la sociología*. Santiago de Chile: LOM Ediciones.
- Goldfeder, G., & Eduardo, A. (2000). *Planificación y Administración. Un enfoque integrador*. México: D.F. Trillas.
- Hernández, S.R., Fernández, C.C. & Baptista, L.P. (2010). *Metodología de la investigación*. Perú: McGraw Hill.
- Hernández y Rodríguez, S. (2002). *Administración. Pensamiento, proceso, estrategia y vanguardia*. D.F., México: Mc Graw Hill.
- Hill, C. W. L., & Jones, G. R. (2009). *Administración Financiera*. México, D.F.: McGraw-Hill.
- INEGI (Ed.). (2014). *Censos económicos 2014. Resumen de los resultados definitivos*.
- INEGI (Ed.). (2015). *Anuario estadístico y geográfico de los Estados Unidos Mexicanos 2015*.
- Johansen, B.O. (2004). *Introducción a la teoría general de sistemas*. México, D.F.: Limusa. Noriega Editores.
- Latorre, E.E. (1996). *Teoría General de Sistemas. Aplicada a la solución integral de problemas*. Santiago de Cali, Colombia: Editorial Universidad del Valle.
- Malhotra, N. K. (2004). *Investigación de mercados. Un enfoque aplicado*. México: Pearson Education.
- Mariño, M. (2009). *Ley Marco para las Cooperativas de América Latina*. San José, Costa Rica: Alianza Cooperativa Internacional.
- Morgado, P., Purificación, B., & Rosado, L. (2006). *Economía social y cooperativismo*. Valladolid, España: Editorial Lex Nova.
- Nieto, M. S. & Recamán, Payo, A. (2010). Capítulo IV. Investigación y conocimiento científico en educación. In *Investigación y evaluación educativa en la sociedad del conocimiento*. Salamanca, España: Ediciones Universidad de Salamanca.
- Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO). (2011). *Orientaciones técnicas para la pesca responsable 5 Supl. 4. Desarrollo de la acuicultura. 4. Enfoque ecosistémico a la acuicultura*. Roma, Italia: FAO.

Ramírez Fernández, P. E., Veloz Atencio, E. E., & Miranda Quiroga, R. (2018). Estudio estratégico para el desarrollo sostenible de la acuicultura de agua dulce en Camagüey. *Acuicultura*, 30(1), 58–65.

Rodríguez, D., & Marcel, A. (1990). *Sociedad y teoría de sistemas*. Santiago, Chile: Editorial Universitaria.

Rosado, P., & Diego, E. (2014). Vilaboa Arroniz, Julio. (2014). *La acuicultura mexicana: Potencialidad, retos y áreas de oportunidad*. *Revista Mexicana de Agronegocios*, 35(Julio-Diciembre), 1065–1071.

Schettino, Y.M. (2002) *México. Problemas sociales, políticos y económicos*. México: Pearson Educación.

SIAP (Ed.). (2016). *Boletines de producción pesquera mensual por estado*.

Tamayo, Tamayo, Mario (2004). *El proceso de la investigación científica*. México: Limusa, Noriega Editores.

Tirso, J.A. (2008). *Factores que influyen en el éxito personal* (Smashwords Edition).

Von Bertalanffy, L. (1989). *Teoría general de los sistemas*. México: D.F. Fondo de Cultura Económica.

Yokoyama, H. (2003). Environmental quality criteria for fish farms in Japan. *Aquaculture (Amsterdam, Netherlands)*, 226(1-4), 45–56. doi:10.1016/S0044-8486(03)00466-6

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