SYSTEMIC COMPLEMENTARITY IN TOURIST MICRO, SMALL AND MEDIUM ENTERPRISES CONSIDERING THE SOCIO-ECOLOGICAL SYSTEM

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ABSTRACT

In Mexican context, the tourism sector has prioritized the income generation, without consider social and ecological dimensions and the impact on ecosystems and social inequality. Characterizing tourist Micro, Small and Medium Enterprises (MSMEs), some aspects are identified such as heterogeneity, absence of international standards as well as the inability to cope the disruption of the environment.

This paper proposes to implement the systemic complementarity concept as an alternative to bring closer the tourist MSMEs to the *exelixis* considering the socio-ecological system, in which it operates. The methodological approach is carried out through the Soft Systems Methodology (SSM), given that this methodology allows considering the subjectivity and complexity in problematic situations integrating relevant actors.

Regarding the findings a conceptual model is proposed based on a associative transformation among MSMEs emphasizing the use of variety, considering its integration. Also, this model seeks to provide emergent properties to the whole system that determine internal functioning and amplify capacities to transcend in its current context.

This proposal will benefit the tourist MSMEs potentialising, through their diversity, the local dynamic and the identity of the destination in consonance with the socio- ecological system.

Keywords: Tourism MSMEs, Complementarity, Soft Systems Methodology, Emergence, Socio-ecological Systems.

INTRODUCTION

The uncontrolled growth of tourist offer faces challenges imposed not only by competition but also changeable contexts, aspects that demand to business a constant introspection and guidelines review for their adaptation.

The tourist offer in Mexico, extends mainly along its coastline (CPTM, 2015), and whose planning of development model prioritises overcrowding, causing an untidy use of coasts and replacement of traditional economic activities for tourist activities. Showing insensitivity toward environment and society systems, an example of this is the direct dependence on using fossil fuel and energy consumption contributes to increase CO_2 emissions to the atmosphere (Cornejo y Chávez, 2014), increase waste, sand extraction, over-exploitation of marine resources, and social disruption that inevitably increase conflicts at the local level.

The few barriers to invest and to be included in tourism sector, have promoted its growth (WTO, 2015), mainly of micro, small and medium enterprises (MSMEs) which comprise 99.6% of the sector. The scarce experience of the entrepreneurs from a beginning implies a challenge to the economic logic, because as a result of not integrating a planning, the lifestyle and income for family support is putted up in the company (Andrews *et al*., 2001). Before comprising its functioning and the relation that they keep in the direction of the destination to which that they integrate.

The theoretical ways focus mainly in commercial, economic and managerial growth framing the weaknesses and disadvantages of the profile of these organisations, without establishing its definition (Rivenda, 2004). Its characterisation based on the number of persons employed and income level are recognised as the basis for its definition and integration to the Mexico business system. Nevertheless, Ashworth and Page (2011) and Haugland (2011), stablish that their study and definition must consider more factors, as the connection with other sectors and changes associated with the destination in which they operate.

The fragmented and disorganised comprehension of these organisations makes difficult not only their definition but the assessment of their abilities to achieve stability against the dynamics of destination, which increases their tendency to collapse, having an impact at local level.

Therefore, to intervene in a holistic way through a collaborative development between disciplines, that is to say, to use the systemic approach generates an integral vision with linkage to ecological and society systems, that until now is interpreted as the facilities for tourist recreation and it is forgotten to consider healthy spaces and comfortable for the locals; and to the social environment as the source of cultural identity to an organisation and for the destination. The tourist activity development depends on the awareness of its actors with regard to the connection between the social and ecological system.

That is why, this kind of organisations forms a complex profile (Thomas *et. al*., 2011), which is limited by characterising a service, endogenous factors, resources disposition, as

well as their association with exogenous elements. The complementarity of their heterogeneous attributes enriches the system empowering it to treat problem situations that inhibit the transcendency of 90% tourist enterprises.

Methodology

Science has allowed to bring validity and order to knowledge through the scientific method, same that has supported development in societies, but it is admitted that its tacit comprehension is in crisis, since it did not have the reflexive capability to criticise its nature and fundamentals, also its reliability limits itself specially the relation between problem and the possible solution and its temporary application, therefore conclusions on science are fruit of an institutionalised system of research, the same that it leaves out other truths.

On the other hand, the Systems Science has the purpose to study the man and his environment as interacting systems (Skyttner, 2005), in addition to boosting complementarity between analytical and empirical reasoning, the integration of willingness formed by different disciplines to achieve its synthesis. Therefore, the goal of the Systems Science is not to substitute traditional science (Ackoff, 1971).

In order to increase the competences and effectiveness to give solution to situations or contexts of the problematic, the work of Jackson and Keys (1984), establish a methodology to relate the context and the Systems Approach, the problem context becomes more difficult to manage while it exhibits major grade of complexity, change and diversity. This treatment of problem contexts comes from two sources: Systems Approach identifies the system manager through the increase of complexity in the problem situations involving various systems, and participants who concern in the situations problem and its solution (Jackson, 2003).

The conjunction of dimensions classifies six problem contexts, same that identify the methodology selection, which facilitate the compression of the nature of systems and guarantee a design to cope its goal and remain viable in a turbulent environment. What allows to conclude that the problem that faces in this study does link in the complex-coercive quadrant, in order to deal with it in a better way the following goal and methodologies are selected **(figure 1)**.

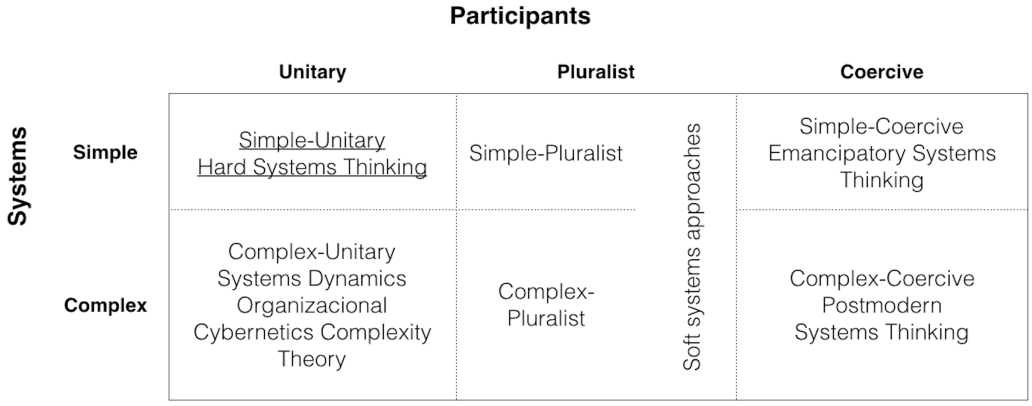

Figure 1. Grid Problem Context and System of System Methodologies (SOSM) from Jackson (1991)

The organised path that gives the rules to this work is the Soft Systems Methodology (SSM), which enables nurture what is inferred as problem situations from different contexts and knowledge, to provide a closer model to real world (Checkland & Poulter, 2006). The SSM is a useful instrument that arises from the real world, provides an enriched view of the problem situation in terms of social activities to cover the system intention, closuring the possibility to impose of a reduced vision which submits the rest (Simonsen, 1994).

The SSM identifies seven stages that not necessarily cover a cycle, but allow to verify the proposal of a conceptual model with the real world and make pertinent adjustments to the first one of being necessary (Checkland, 1993). Among the strengths of this methodology is that solution is not a conclusive process, since from its first state participants generate attitudes and perceptions that are continuously explored, checked and changed to provides viability to the system, that is to say, a global learning process is propitiated.

The diagnosis of problem situation is confined within the limits or boundaries, delimiting the components and individualises them of all that is not contained in the system (environment), but its has with it and conditions its operation. The limits can be determined in three aspects: structural, dynamic and functional (Van Gigch 2011); despite the frequent use of the hierarchic organisation of human activities to identify structures on systems, the holarchic sketch, links the organised complexity in different levels to generate emergent properties in an integrated system, escaping from the notion of domain and subordination, as well as the ecosystems are organised.

The social system increases the creativity to intervene in a situation problem, in addition of representing the knowledge for a feasible and desirable configuration of the system. The first stage in the way of not minimise the vision to a problem, but open the possibility to identify a set of problems that can be solved in a cultural understanding, social economic, political and ecological for the good development of the tourist MSMEs.

- Stage 1 - situation considered problematical. Aims to explore and distinguish the elements involved. This stage allows to begin of an arbitrary vision that leaves to recognises the limits of the problem situation toward the environment.

The elements related to the first structure are located in five recursion levels **(figure 2)**:

The first level identifies in an individual vision the tourist MSMEs as central component, which composes of two dimensions: management and operation. Management is responsible of directing the organisation intention, to take advantage of the knowledge and information, as well as involve an organisational culture. Operation distinguishes service execution and material and technological resources supply to cover the productivity level. As a whole, dimensions should seek self-organisation, learning, innovation and the satisfaction of the user, through the fulfilment of the responsibilities assigned.

This first level identifies as a dynamic element entropy defined as the degree of disorder in the system, which tends to increase only if the system is opened to receive negentropy.

The second and third recursion levels are the inductors to relate organisations and their environment. The second one, identifies a set of elements that have impact on the interaction among SMEs, as the managerial, tourist and local information; safety for the tourists, support infrastructure to tourism; finally, the needs of the real and potential tourists. It is distinguished as a dynamic element to negentropy (entropy of the environment) (François, 2004). The third recursion level, places elements that regulate an organisation with its environment: prices, quality, productivity, target and image of a destination or a stability between the internal and external disorder of the system.

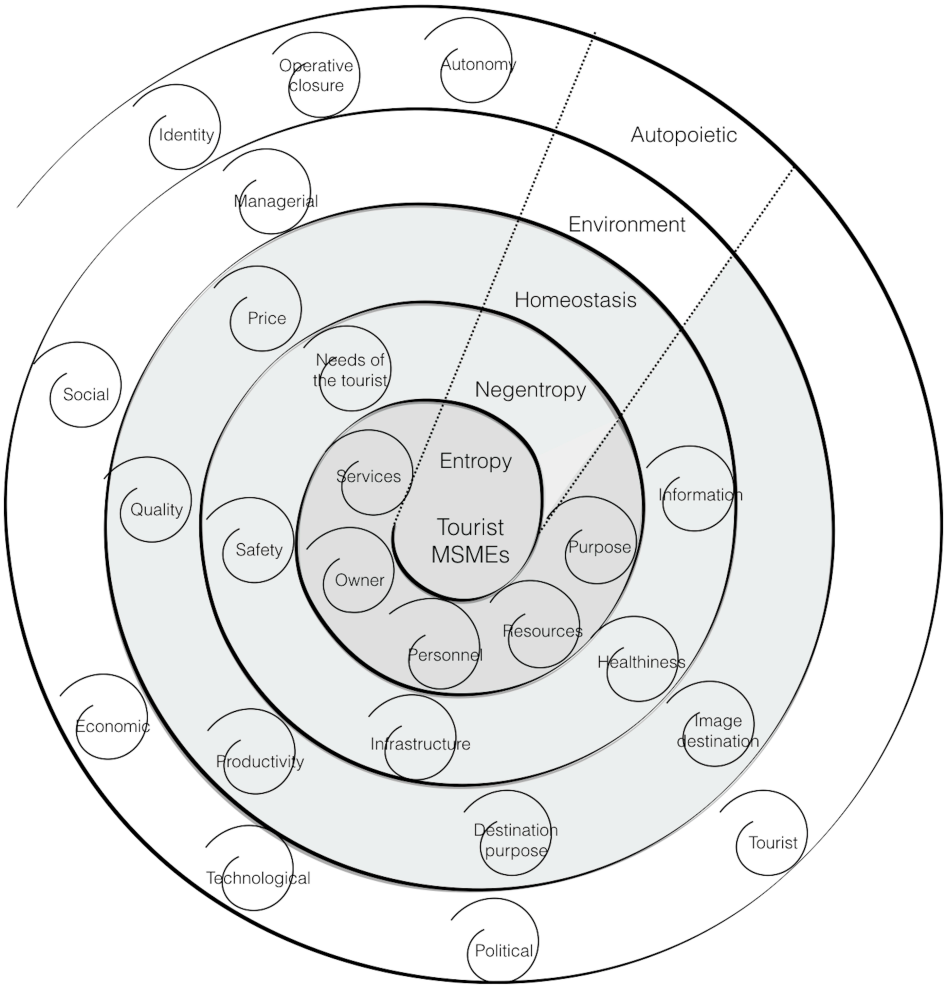

Figure 2. Situation Considered Problematical

The elements of the environment are located in the fourth level, and it includes those local dimensions that have relevance to the development of an organisation: resources and natural spaces, managerial, social, economic, technological, political, tourist.

The fifth recursion level, is determined by factors that engage the system complexity, system autonomy, operative or organisational closure and the system identity. The order emergence determines what is relevant for the system, allowing to define and control the the element organisation under certain conditions, resulting in a system evolutionary identity.

- Stage 2 - Problem situation: expressed. It allows to detect pathologies of the problem situation in three types: individual, group and organisational (Warfield, 1994). As basic elements, persons included in tourist MSMEs may lack confidence in the organisation, because of the absence of stability, this instinct can be evident in any

moment and be reflected in any action of the individuals. The idiosyncrasy is assumed as a predominant condition, in an individual and group aspect, which can overcome the formation and the educational level of persons. Nevertheless, it is necessary to consider empirical knowledge as the influence frame for its connection with the socio-ecological system.

The interaction between persons, can also impact in a negative way on the organisations involved, therefore, it is important to take into consideration that a group can take bad or slightly rational decisions. As well as it is necessary to identify cohesion, as a factor that allows to overestimate the preponderant thing for MSMEs, and evaluate the alternative action courses.

In the organisational level, the two types of pathologies are inherent, jointly the company performance is described on the basis of inputs and outputs, it is to say in functional terms; without consider alterations to their socio-ecological system. Also the absence of credibility from owners or manager to the staff it is identified respect capacities and knowledge that persons integrate operative levels.

Therefore, the use of techniques such as authoritarianism, insufficient information and late communication, are related to the progressive destruction of the tourist MSMEs conglomerate, described as the asphyxia of the system because of changes and information inside their environment, implying an overcharge information which increases system entropy.

The progressive disorganisation of communication lines among recursion levels, leads to coherence loss and the late reaction ability. The ignorance and confusion in the codification and decoding process, leads to the progressive interactions loss between the subsystems or members of the systems (François, 2004). Purposes incompatibility in different recursion levels.

- Stage 3 – Root definitions of relevant purposeful activity systems. Describes the fundamental characteristics in order to achieve the transformation process to an organised system:

"A model that through the systemic complementarity among tourist MSMEs, that is to say, across the emergent properties of the interaction without losing their autonomy allows to take them to the *exelisis* state, and this new order conduct them to evolution as regards its environment named tourist destination".

The CATWOE mnemonic, provides the parameters to assure the accuracy of the root definition. Its structure groups relevant actors which can affect positively or negatively the behaviour of the system (Jackson, 2003).

Clients: Owners and Management of tourist MSMEs, tourist destination and tourists.

Agents: Management and tourist MSMEs staff.

Transformation: express the conversion process. Logical order of the properties of the units, association of properties and attributes whole MSMEs tourist and induce mechanisms of attenuation and amplification **(figure 3)**.

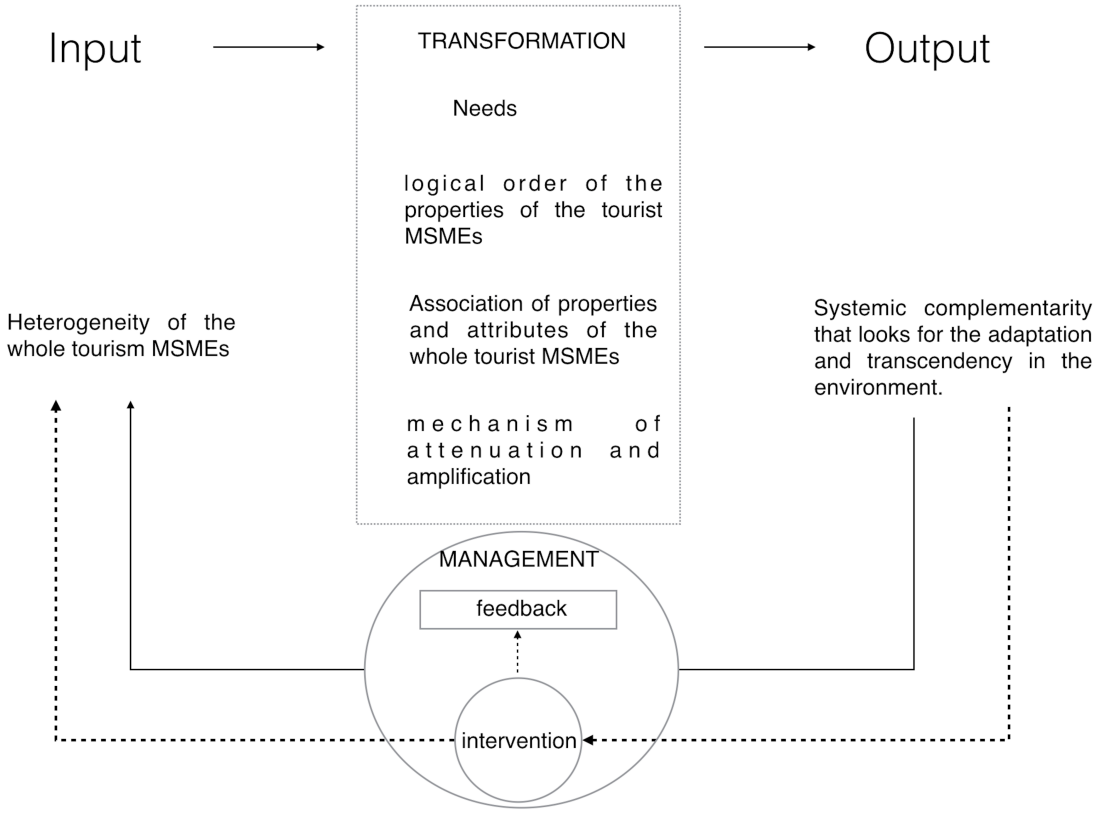

Figure 3. Transformation of the Mnemonics CATWOE

Owners: MSMEs owners, managers and employees. The public sector, representatives of the tourism public sector may collide with the organisation of the MSMEs.

World view: expression that refers to the image of the world, which makes necessary the transformation of the system of human activity in particular, is significant in the context.

The tourist MSMEs do not assume, that their ties with the socio-ecological system emerge new attributes and properties that strengthens their identity, aspect that should be prioritised to the generation of income and to copy models created for large companies.

To value cultural and ecological richness promotes new ways to learn and understand its evolution in the destination in which they are unrolled. The system determines its relevance not only seeks the *exelisis* business units, but the equilibrium that propitiate locally, through the consideration of mechanisms that seek its permanence across the comprehension of the dynamics that presents the destination, facilitating the variety control.

Environment: endogenous impositions of the system it is classified in three ways:

1. Managerial: innovations in organisation management, managerial policies, commercial relations that could affect the businessmen, managerial supports.

2. Tourism: tourism markets, trends in tourist subsectors, changes in national tourism policy, state and municipal level, sectorial support.

3. General: social, political, economic, natural events that could affect social groups included in the tourist MSMEs.

Conceptual Model

The conceptual model of the relevant systems named in the root definitions, involves the identification and organisation of all necessary activities and oriented to the system transformation. The systems interact from communicative processes allowing equilibrate the variety in relation to their environment in order to regulate the system (Gershenson, 2015).

The descriptions synthesis obtained in this stage are abstracted in the construct composition **(figure 4)**. The complementarity among organisations enables the approximation to the *exilisis* in a particular way, since the emergent properties, correspond to attenuation processes of variety of the information and amplification of the performance of the organisations in the transitions of an evolutionary process.

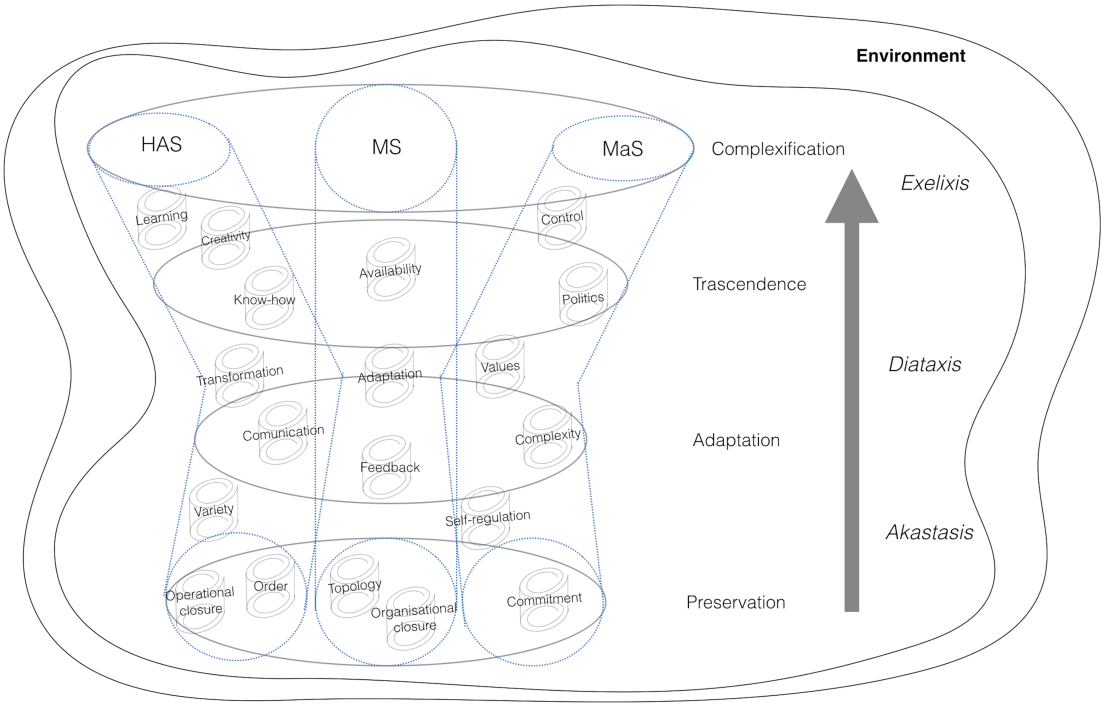

Figure 4. Conceptual Model

Management system (MaS): responsible on generating knowledge and provide rules to assure performance of the whole in accordance to the purpose. The control of operational activities and decision-making leads to the purpose of the whole, to establish performance measurement of interactions, to develop and validate a decision-making process as conglomerate that do not bring implications to the autonomy of each MSMEs.

Organise the basic aspects for business cooperation, generates policies and commitments for the work as a whole, make decisions. This system serves as the strategic planning, preventing a balance between *akastasis* (disorder) internal and external expertise to achieve the *diataxis* (reordering) in each holon system (Tejeida, 2005).

Human Activity System (HAS): responsible for ensuring consistency in the processes required for the purpose of the total system. The heterogeneity enriches the properties of the system for this system must: integrate the necessary properties, to guarantee that the interaction level between the components contributes to the *exelisis* state. This system organises the components of each subsystem.

Morphogenesis System (MS): regulates the internal and external communication of the entire system. Also, organises the interrelations differentiating components and environment. The essence of this system lies in establishing the criteria of the system boundaries, for that analyses interactions between subsystems, distinguishing environment and the interactions of the subsystems with the general system, allowing the introduction or information exclusion to the whole. Among the main activities of this system, is to control the adaptation of the interactions to achieve the purpose and monitoring the resources necessary for its availability in the operation.

The three systems work in an evolutionary process in which the releases above transcend and include its predecessors, allowing the learning process that represents the way to the system *exelisis* of tourist MSMEs.

Discussion

If the tourist MSMEs want to provide efficiently their services, they need to focus in conditions for its development and the degradation of socio-ecological system components. The conceptual model, being an abstraction of the reality, needs to be validated the formality of the system and its utility to reduce problem situations. The proposal can be improved to by two processes, first t is to verify its components and the second one its to reasoning trough other systemic thoughts.

The first evaluation has the purpose to recognise the conceptualisation solvency of the system. Validation as formal system is associated with the verification of the model components that guarantees the purpose formulation system and its structure in holons, seeking the performance measurement, decision-making process, systemic properties, provision of resources, and ultimately guarantee its remained as a system.

In order to obtain safety of the conceptual model and to guarantee its validity, the second test implies its comparison with someone another thought of systemic, this technique allows to identify some components that were extracted in the proposal. The value found in of this cross-check is an identification of congruities, seriousness and viability of the system.

The Viable System Model assimilates the structural and functional configuration, which relations define the organisation ability of maintaining its independent existence any time it belongs to, or is inside an environment of which it is nourished and receives influence.

The property of self-reference of viable systems, it is one of the conditions that thinks about how to assume this investigation since it provides to the system of the following capacities: maintenance of identity of the system that produces and connects the operations that define it. The regulative connection of the interactions and the states of the operations mark an existence tendency for the system that separates it from the environment in which it is immersed, providing it with an identity that tends to be supported thanks to the reproduction of the different components of the system; the auto-repair that happens why every operation makes sense in terms of other operations, if some of the operations that are carried out in the system is seen of some form affected in negative form, this one as the first measurement will try to be reproduced.

If this does not work other operations will be re-formed to introduce again in the system the functionality that this operation cannot already give; the conscience of itself as a viable system shows that not only its entity of main control is conscious of the states of the system, but opposite to some changes in the environment there are immediate answers, what presupposes the conscience of the states of the system in more elementary organisation levels.

The problem of the environment complexity is theoretically infinite, in the same way, the organisation is more complex than the management, therefore, the set the imbalances are attended by the amplification of variety of the management and the extenuation of the organisation and by means of the amplification of the answer of the organisation towards the environment.

Therefore, this study is limited by the all interrelations contained in the socio-ecological system, even still looking for their reduction it would be difficult to treat them, so that this absence of information increases the uncertainty about the system.

Conclusion

The value that gives the Systems Approach to the subjective thing allows to give solutions balanced between the rational thing and the intangible thing, to problematic with relevancy in acting of every day.

The SSM provided the techniques and general guidelines to express the situation considered problem and have implications to a continue learning process. The strengths of the methodology allowed to describe reality of the world on having assumed like the first source its multiple participants and the influence of its actions in the problem

situation, this way a reflection was made on the learning process of the system and to move away from the lacks of deterministic and coercive models.

If the patterns of human actions change, then restrictions change, and the structure and dynamics of the socio-ecological system consequently can change.

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