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Celina López González  
General translation proofreader



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Silvia E. Álvarez Arana

*Responsible Editor*

Gabriel Velázquez Toledo

*Executive Editors*

Celina López González

*General Translation Proofreader*

Joshep Fabian Coronel Gómez

*Web and Editorial Design*

Diego Mendoza Vazquez

*Web Master*

Lucía G. León Brandi

*Founding Director (2012)*

University Campus, Building D,  
Ejido Emiliano Zapata Highway, Kilometer 8  
Tuxtla Gutierrez, Chiapas; Mexico. Zip Code 29000

E-mail: [espacioimasd@gmail.com](mailto:espacioimasd@gmail.com),  
[espacioimasd@unach.mx](mailto:espacioimasd@unach.mx)

[www.espacioimasd.unach.mx](http://www.espacioimasd.unach.mx)

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## EDITOR'S LETTER

Dear readers, we put at your disposal the last magazine of 2018. For those of us who constitute the Magazine *Espacio I + D Innovación más Desarrollo*, it is a pleasure to see that six years ago our scientific and academic dissemination body in the UNACH has been strengthened, for which we do not stop thanking all the actors who, in one way or another, are involved in this consolidation process, which today allows us to enter the Latindex Catalog 2.0, under the new editorial quality criteria for digital magazines.

In this 18th issue, we have international collaborations such as the National University of Rosario, Argentina, with the article *Socio-environmental interventions, practices of care and construction of citizenship from a gender and human rights perspective*. Three articles from within the country named: *Geert Hofstede's masculinity-femininity platform in the organizational culture of the tourist companies of Bahías de Huatulco, Oaxaca* of the Universidad del Mar, *The administrative limitations to the human right to identity, the case of the Mexican outer service*; of the Faculty of Administrative and Social Sciences of the Universidad Autónoma de Baja California Campus Valle Dorado, Ensenada and, *Optimization of the aqueous enzymatic extraction of oil from *Oecopetalum mexicanum**, from the National Institute of Technology of Mexico (Veracruz and Tuxtla Gutiérrez).

From the Universidad Autónoma de Chiapas, we present the following contents: *Preliminary risk analysis of climate change in the coast of Tapachula Municipality, Chiapas, Mexico*. Also in this issue we conclude with the publication of articles derived from the International Congress on Poverty, Migration and Development, organized by CEDES - UNACH, with three titles: *Autonomy and subnational financial dependence, evidence for a local development policy in Mexico*; *Recent trends in internal migration in Nuevo Leon, Mexico* (UNAL) and *Child labor and food insecurity in chiapanecos children, a case study* (UNACH).


This is a special issue because we incorporate in the section "Academic Documents", a text from the students and professors of the Faculty of Physics and Mathematical Sciences of our University, called: *Do eclipses cause earthquakes?*, with which we hope that more collaborators from other areas of knowledge will approach this publication and make it their means of dissemination.

On this occasion, we celebrate the incorporation of a new collection of digital books, called "Letras chiapanecas", which, up to now, consists of five

studies of the life and work of authors of this entity, with the purpose of letting new generations know the importance of their literary contributions. It is worth mentioning that this collection would not have been possible without the support of the Publishing Directorate of the Consejo Estatal para la Cultura y las Artes de Chiapas (CONECULTA). Also produced by this co-publication UNACH - CONECULTA, the academic report "Letras chiapanecas: research and literary analysis" is presented.

As in the previous issues, our space "Cultural breviaries" is dedicated to an artist from Chiapas; in this case Dr. Douglas Bringas will talk about the musician Fernando Soria.

Enjoy this Space of Innovation, Development, Knowledge and Culture.

Enjoy your reading! 

*"Por la conciencia de la necesidad de servir"*  
Universidad Autónoma de Chiapas

The editors

A R T I C L E S

SOCIO-ENVIRONMENTAL  
INTERVENTIONS, PRACTICES OF  
CARE AND CONSTRUCTION OF  
CITIZENSHIP FROM A GENDER AND  
HUMAN RIGHTS PERSPECTIVE<sup>1</sup>

—

María Natalia Echegoyemberry  
echegoyemberry2014@gmail.com

CENTER FOR INTERDISCIPLINARY STUDIES.  
NATIONAL UNIVERSITY OF ROSARIO (UNR), ARGENTINA

<sup>1</sup> Conferences held within the framework of the International Seminar on Social Work: "The political economy of care: challenges for families and the social intervention of the 21st century", November 13th to 17th, 2017, Universidad Autónoma de Chile, Talca, Temuco, Santiago de Chile .

To quote this article:

Echegoyemberry, María Natalia. (2018) Intervenciones socio-ambientales, prácticas de cuidado y construcción de ciudadanía desde una perspectiva de Género y de Derechos Humanos. *Espacio I+D Innovación más Desarrollo.*, 7(18) 8-38. Recuperado de: <http://dx.doi.org/10.31644/IMASD.7.2018.a01>

— *Abstract* —

The article points out the need to think about socio-environmental interventions, care practices and citizenship from a gender and Human Rights perspective, framing the problems described in contexts of socio-urban segregation.

Likewise, it establishes some guidelines to be taken into account for the elaboration of socio-environmental interventions from a critical perspective, proposing some challenges for the design, elaboration and implementation of public policies "from and with" people, groups and communities. Therefore, it proposes community legal empowerment as the central axis of social interventions to achieve "use, know and transform the law" and in this way build citizenship. Finally, it mentions some conditions in which interventions can function as eminently political tools for the inclusion.

**Keywords**

*Socio-environmental interventions; citizenship; care practices; Human rights; Gender perspective; community legal empowerment.*

The concepts of care practices, citizenship and socio-environmental interventions are defined and the inter-relationships that are established between them based on the care economy are clarified, framing gender issues in contexts of socio-urban segregation<sup>1</sup>, where the environmental impacts generate situations of *injustice and environmental suffering*. Likewise, the need to think about socio-environmental interventions from a gender and human rights perspective is pointed out and some guidelines are established to be taken into account in the preparation of these from a critical perspective, proposing some challenges for the design, preparation and implementation of public policies "from and with" people, groups and communities. One of them is to incorporate *community legal empowerment* as the central axis of social interventions to achieve "use, know and transform the law" and in this way build citizenship.

The questions that are explained guide this article: What does it imply to think about socio-environmental interventions, care practices and citizenship from a gender and Human Rights perspective? What are the guidelines for social interventions from a critical perspective? How to incorporate the current challenges that object the elaboration of public policies "from and with" the community? Why does *community legal empowerment* become the central axis of social interventions?

The use of the concept of socio-environmental interventions<sup>2</sup> is proposed, to characterize a specific type of social intervention that is elaborated, managed and implemented situated and contextualized in spaces of socio-spatial segregation. In effect, we can understand it as a type of social intervention that takes as its object the complexity<sup>3</sup> of the environmental field<sup>4</sup>. The

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1 AN: The concept of **socio-urban** or **socio-spatial segregation** will be used: to allude to a complex process characterized by a differential production of habitat, unequal access to goods and services; subjective perception of this inequality by communities, groups or people; State interventions that accentuate the disparate exercise of rights; preeminence of the logic of the market over legal logics that generate situations of environmental injustice that impacts in an unequal way in the communities.

2 AN: this concept is retaken and deepened in the following sections of the article.

3 AN: Complexity in terms of Morín (2001), meaning, taking the environment as a complex object implies assuming that it is a system, in which a linear logic of determination (cause of effect) does not rule but circularity, recurrence, feedback, fuzziness of spatial-temporal limits, disorder and uncertainty (Morin, 2001). Affirm that -the environment is a complex object- leads to propose a methodology for these objects. Thus, Almeida Filho (2008) argues the need for transdisciplinarity for the approach of complex objects, this would allow an integrating response of different knowledge, and would involve the joint construction of a problem. Therefore, she proposes transdisciplinarity as a methodological structure of complexity, so complex objects must be constructed from the polysemy of disciplinary discursive entanglements (Leff, 2002).

4 AN: Field in the sense of Pierre Bourdieu's Field Theory, that is, in terms of unequal power relations.

interventions seek to generate a change from an initial situation and influence the interactions that people make with the environment promoting other ways of relating to natural resources, through the construction of meanings and the amplification of the community action repertoire. In this way it is questioned and problematized economic rationality to propose the passage to an environmental rationality. This promotes sustainability; the commitment to care for the environment; equity; the shared but differentiated responsibility between State and society; intergenerational solidarity; environmental justice and, therefore, the extension of citizenship. The central axis is the empowerment of rights, and in this sense, they are an eminently political instrument, necessarily linked to the framework of Human Rights.

## II. CARE ECONOMY APPROACH

The term Care economy works as the conceptual category that allows the debate about social inequalities between men and women, care being a determinant of inequality, which occurs within the feminist theory that seeks the account of the relationships between the distribution and social organization of care and the sexual division of labor (Enríquez, 2015).

It should be noted that care -the practices of care<sup>5</sup>- is a central theme of the feminist agenda. However, in most Latin American countries, it cannot be translated into public policies, so it is women who appear replacing the deficit in public care policies<sup>7</sup>.

According to Rodríguez Enríquez (2005) there would be an intimate relationship between the ways that a society organizes the care and functioning of the economic system. Thus, the care economy places the focus on the centrality of care in the development of the countries and the gender issues involved become relevant; being necessary, from a critical perspective, to reveal the social and economic value that care generates, as it refers to

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5 AN: For the purposes of this article when the concept of care is used, it is done in the sense established by Menéndez (2003), where care does not involve only actions or activities of an instrumental nature -although it may include them-, but they are social practices, where the activities that are developed are intertwined with meanings and, therefore, care practices cannot be independent of the people who perform them, nor of the social context in which they arise; there is a continuous process of transactions between social practices, subjects and meanings.

6 AN: An advance in public policies of care can be pointed out in the National Care Plan that Uruguay is carrying out (Law 19.353, System of care, Uruguay, National Plan of Care). Available at <http://www.sistemadecuidados.gub.uy/55685/care>

those social and economic practices that together with the use of goods and services serve for the daily social reproduction of women and men's lives.

Care contributes in the production of economic value, however this value is not taken into account by the economy. To the point that an inactive population is considered to be that which does not produce economic goods or services, this population includes those who carry out care activities for third parties (children, adults, dependents), and all those unpaid activities carried out at home as medical, physiological and social care (Aguirre, 2009).<sup>7</sup>

In effect, there is no way to reward these practices; it seems to derive from a *familiar*<sup>8</sup> and / or *maternalistic* position of care, in which women appear as one of the main resources for health and social reproduction. Around the existence of these a series of rights-duties of care has been organized, and the role they must assume in such practices has been naturalized, defining as the own femininity. Thus Folbre (2001) critically points out that "*women have a legacy: responsibility in the provision of care*" and this type of discourse is usually internalized, naturalized circulating as power discourses.

It should be noted that the dynamics of social reproduction and inequalities and differential impacts that occur for women have been silenced, particularly in those contexts of socio-urban and legal segregation where environmental problems impact even more unequally than in other contexts.

Therefore, it is necessary to consider in the design of public policies, and in socio-environmental interventions, the differential impacts on environmental issues that call for taking into account the interrelationships established between the *intersectionality* of gender, environment and territory.

Different authors agree that the effects of environmental damage affect more people in poverty, due to less access to resources and less possibility of using

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7 AN: It is common to find in the survey, censuses and relief forms that are carried out from the State, categories such as: "works/does not work". Must be formulated in terms of "paid work/unpaid work" to not naturalize and make invisible gender inequalities, being necessary for the State to include in its relief documents a non-sexist and inclusive language. The difference, he points out, is not only symbolic.

8 Interventions must question the "family ideal" that the official discourses sustain, in which historical conditions are perpetuated, social control and social reproduction are exercised. Martín Baró criticizes the symbolism of family (monogamous, catholic, white, western), this ideal is not consistent with the Central American reality (where situations of polyarchy, polygamy, matriarch families, consensual unions are verified), however the ideal is sustained because it is functional to the capitalist mode of production.



political mechanisms or institutional resources (information, participation) and access to justice (Downey, 2005; Martuzzi, Mitis & Forastiere, 2010). Within this group, women and *minority* groups are aggravated.

In fact, the territory was configured under the patriarchal, androcentric model, functional to the needs of capitalism, in which productive activities were privileged over reproductive ones, which led to the disparate exercise of the right to the city for women and to make invisible the differentiated demands by gender (Fenster, 2006).

The communities in poverty live in territories where injustices or inequities in social, economic, political, cultural, ethnic, gender and environmental matters are observed.

This is how communities and natural resources are exposed to different chemical, physical and biological agents; soil, air and water contamination; presence of macro and micro dumps; with insufficient urban infrastructure; inaccessibility to basic sanitation (safe water and sewers).<sup>9</sup>

The degradation of the environment, "natural" or constructed, is geographically distributed unevenly in regions that can compose the same jurisdiction,

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9 AN: A paradigmatic case in environmental matters in Argentina is the ruling: "Mendoza". In July 2004 a group of people living in Villa Inflamable, Avellaneda, Province of Buenos Aires filed a lawsuit against the National State, the Province of Buenos Aires, the City of Buenos Aires and 44 companies, demanding the cessation of environmental contamination, the recomposition of the environmental damage, the creation of a fund to finance the sanitation of the watershed and the economic compensation for damages suffered by the contamination. Following this, in July 2008 the Supreme Court of Justice of the Nation (CSJN) dictates a fault: "**M. 1596 XL Mendoza, Silvia Beatriz and others C/National State and others S/ damages (derived from environmental pollution Río Matanza-Riachuelo)**" (CSJN, Ruling 331: 1622) which has been indicated as transcendental in environmental matters, by which determines the responsibility of the National State, the Province of Buenos Aires and the City of Buenos Aires and is condemned to clean up the stream, setting three simultaneous objectives: 1) improvement of the quality of life; 2) the recomposition of the environment, and 3) the prevention of damage with sufficient and reasonable degree of prediction. Likewise, the preparation of a Comprehensive Sanitation Plan (PISA) is ordered and establishes as authority in charge of the execution the Authority of Matanza Riachuelo Watershed (created by Law 26.168). However, almost ten years after the ruling, the quality of life of the population has not changed. The population of Villa Inflamable grew in the vicinity of the largest petrochemical center in the country; the neighborhood is settled on landfill and on areas of open-air-lagoons and swamps, being in the area of urban solid waste disposal (SWD). The proximity to the petrochemical center of the population means that it is exposed to pollution and risks due to industrial technological accidents (JICA, 2001), in addition to deficiencies in the control of pollutants and risk management. Numerous studies were carried out in which health effects of its inhabitants were verified (JICA, 2001, EISAR, 2013), however, access to the necessary health care has not been guaranteed, nor sources of exposure have been eliminated. It should be borne in mind that in Villa Inflamable most of the inhabitants lack basic infrastructure (water, sewage) and access to other essential services, and that there have not yet been urbanization processes or socio-urban integration.

with the presence of contaminated lands without remediation, housing implanted on landfills; absence or scarce regulation of land use; insufficient control mechanisms; insufficiency, scarce regulatory measures to influence the reduction of exposures to pollutants without the implementation of processes of adaptation or industrial reconversion; unhealthy ways of life and work in companies, polluting factories; precarious jobs without explicit health coverage and without social security protection that aggravate the situation individually and collectively.

In this sense, the health / disease / care processes are affected in these territories, impacting unequally on the most vulnerable populations and communities, where risks and effects on health are significantly increased. According to Kozulj (2009) households that do not have basic services such as water, are subject to additional costs and negative effects on health (gastro-intestinal diseases, loss of healthy years, school absenteeism) and opportunity costs (water transportation time affects women more in these territories).<sup>10</sup>

Carrasco Rey (2004) states that factors such as illiteracy, overcrowding, lack of health posts, lack of drinking water and health services and diseases (such as TBC), are distributed more frequently in marginal settlements. These regions are generally outside the urban design, without urban and social integration, where their standards are not met and therefore also the conditions involved in urban planning (safe structural conditions, adequate sanitation services, efficient transport, access to education, justice, health, etc.).

In fact, different activities carried out by women in territories without basic infrastructure, considerably increase gender inequality. Thus for Kozulj (2009), the lack in these territories of access to modern sources of energy implies that they resort to the use of firewood for cooking and heating; women in general are those who deal with these activities, with the cost of opportunities also differential (which restricts their participation in the labor market and school attendance).

This scenario -of lack of protection- is presented and repeated in the different regions of Latin America and in the interior of each national,

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10 AN: Thus, for example in Villa Inflamable access to water is not guaranteed. However, through actions organized in general by the women of the neighborhood, they managed to get the State to provide water in drums (which to date is not enough in quantity, nor safe in quality). These drums are then distributed through 12 water stations also run by women in the neighborhood. Carrying water from the stand to the home is a feminized activity. Currently, as a result of community activism, work has started on the extension of the drinking water network.

provincial and municipal jurisdiction, the imbalances and inequities in environmental terms, and urban and social integration, in which there is citizenship with full enjoyment of their rights and pre-citizens or proto-citizens in relation to the same rights.

That is why it is proposed that the basis of social interventions take into account aspects related to the care economy, gender perspective and rights, as they allow us to identify critical nodes that would otherwise seem isolated or not integrated into the same matrix: the inequality and inequity that arises from the capitalist mode of production.

In these territories it is verified what Merlinsky (2013) describes as situations of environmental injustice, that is to say: *"forms of inequality that is usually invisible, in which disproportionate concentrations of environmental hazards are concentrated in the territories of greater social relegation and citizens with less political and economic power"*.

In this way, as the environmental issues are expressed, they are presented in the urban landscape, they make an impact; they are formulated unequally on the rights and health of women and girls, as well as in minority groups, they enjoy and access differently to natural, cultural and environmental resources. Thus, women in situations of poverty, experience multiple situations of vulnerability (environmental, social, economic, health), and are exposed to multiple situations of discrimination<sup>11</sup> (gender, class, ethnicity, nationality, religious affiliation). Following along the same line, the CEDAW Committee considers that the discrimination of women on grounds of sex and gender is linked in an indivisible manner to other factors that affect women, such as race, ethnic origin, religion or beliefs, health, status, age, class, caste, sexual orientation and gender identity (CEDAW, 2010, Aristegui & Vázquez, 2013). In coincidence, ECLAC (2016) considers that racial and ethnic inequalities intersect and interrelate with gender inequalities, establishing gaps that increase the vulnerability of a social group. Likewise, Breilh (1996) considers that inequities towards women are posed in terms not only of gender, but also of social and ethnic origins and have their genesis in the accumulation and distribution of power, operating as structural determinants of social inequality.

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11 AN: These multiple dimensions and discriminations that are added to those of gender are called: intersectionality of gender, to designate with it a field of study in which the variables in analysis cannot be independent since multiple identities converge in the same person that influence in the access and exercise of rights.

That is why it is necessary to incorporate the gender perspective, in particular the *gender intersectionality* in the analysis of Human Rights, environment and territory, since it implies, on the one hand, being able to deepen the dynamics generated by inequalities or exclusions; and on the other, to understand social inequalities as emerging from these interrelationships. In this way, it is necessary not only to analyze the consequences, but also to investigate the processes that generate exclusions and restrictions on citizenship. In this sense, Castel (2010) calls to recover the logic from which the "in" produce the "out", reconstructing the continuum of positions that link the excluded with those included in the citizenship.

Buckingham (2010) considers that gender analysis must be incorporated into any debate on Human Rights, which is essential, as it is the dimension that would allow a thorough examination of the inequalities that exist.

As already mentioned, it is in relation to women in poverty that the effects of environmental deterioration are predominantly verified (Inmujeres, 2008) and, paradoxically, to those who are assigned higher expectations in the fight against climate change, without being guaranteed the material conditions of survival or development, or linked with the agency capacity of these (Echegoyemberry, 2017).

It is important to point out that despite the relevance of the gender dimension, there is still little production of knowledge and indicators that account for gender relations linked to the environment (quality, quantity, uniformity). Thus, it is considered that knowledge about management processes, environmental changes and knowledge about the situation of women and men in terms of sustainability and the weight that gender relations have in these processes is insufficient, added to the lack of statistical information that shows the differentiated impact, and the gender asymmetries in the access and use of natural resources and the differentiated impacts by sex of the environmental problems (Inmujeres, 2008). Likewise, it is considered that the articulation of gender and the environment has been of little importance in the formulation of public plans and programs, and this linkage still remains lateral in development policies (Nieves Rico, 1998).

As previously expressed, it is women who are in a situation of poverty who see their autonomy limited, and their citizenship restricted: with less or scarce participation in decision-making and management spaces, unequal access to a formal job, if they reach access is done with precarious con-

tracting modalities, without social security protection, without access to land ownership, to the enjoyment of products and less access to formal education<sup>12</sup>.

Gender inequality is considered one of the most important factors that increase the social vulnerability of women in the face of climate change. Indeed, according to the United Nations (2007), women are more affected by climate change (UNDP, 2007).

It can be mentioned that in Latin America there is a phenomenon of increasing femininity in poor households, where women have lower incomes and it is women (heads of households) who account for the majority of non-contributory State transfers (ECLAC, 2016a, 2016b).

Women's lack of access to paid work excludes them as subjects of rights and deprives them of access to social protection, in this sense the loss of the worker status, or never reaching it, deprives people of work, but also of one of the main ways of realization, and of the material and symbolic conditions to develop themselves (Castel, 2010).

ECLAC (2016a) found that the difference in women's labor participation makes it possible to explain that the percentage of women without their own income triples in relation to men. The gap between labor incomes by sex is also significant in a large part of the countries of the region, and ethnic inequalities increase disadvantages (ECLAC, 2014a).

In different studies it was found that the unpaid work done by women in the domestic sphere limits their autonomy, as well as, they see their rights reduced in terms of less enjoyment of free time, recreation and leisure.

In this sense, it was corroborated that women perform a minimum of 60% of the total unpaid work load (ECLAC, 2016). This is how women appear, replacing the deficit of public gender policies and, in particular, care policies. Pautassi (2007) considers that the autonomy of women and the citizenship of those they care for are affected by the lack of public debate about norms, services and resources that society is willing to ensure to guarantee care. The way of production is maintained and reproduced, at the expense of not remunerating the activity carried out

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12 AN: Being the situation for trans people even worse.

by the family and in particular the woman (Salvador, 2007). It generates an economic value that is not recognized or remunerated and prevents, in turn, the search and maintenance of a remunerated job (Enríquez, 2015).

Different studies show how women are living in poverty, which among other aspects are limited accessibility to the health system due to the existence of different barriers: symbolic, administrative, economic, geographical (Comes, Solitario, Garbus, 2006). This situation of denial of rights is expressed in the daily routine of health services, as a situation of "*pilgrimage*". Indeed according to Fleury (2003, 2013) this concept "*reveals not only the suffering of patients in search of access, but the humiliation in front of the denial of the right and the public irresponsibility of the different health operators that refer the problem to the search for an individual solution, outside the collective contract of citizenship*" (2003: 17).

It should be noted that inequalities and gender discrimination are expressed in the health of women and girls. Tajer (2009a) found that gender plays a fundamental role in diseases, for example in relation to ischemic heart disease, found that there is inequity in care for women, these are the worst attended and have higher mortality at all ages in relation to this pathology. There is also an impact on the mental health of women, due to an increase in depression due to the psychic impact of living a subordinate social role (Tajer, 2009b, 2004). However, these factors are not usually related to the social structure that produces them, but they are experienced as individual -intrapsychic- problems of each of the women. It is possible to point out the need to situate the gender and environment problems in the social structure, and in particular, within the capitalist method of production.

Inequities are not only expressed in the ways of getting sick, but also in the ways of dying. In effect, the response capacity of women in the face of a natural disaster is limited by situations such as lack of information, access to technologies, and responsibility in the care of others. The social situation prior to the disaster, in the case of women, considerably increases the risks and impacts on their health. Therefore, it has been found that women are more vulnerable to the most extreme natural events. Thus, women and children are 14 times more likely to perish in a natural disaster (Inmujeres, 2008). But this vulnerability does not happen by its own nature, it is not internal, but rather it comes from previous processes that few investigations have dealt with. To our knowledge, adverse conditions for the health and life of women and girls already exists the occurrence of the adverse event. Therefore, Natenzón (1995) raises the need to analyze the social structure

prior to the occurrence of the "natural disaster", since it is this that will demarcate the consequences and scope of the disaster and mediate the possibilities of responses.

Similarly Wilches Chaux (1989) considers that communities with greater social integration are less vulnerable and can respond better to the consequences of a disaster. This way, natural disaster appears as a social phenomenon associated with social vulnerability, within which gender (intersectionality) is inscribed.

Within the political consequences we are faced with a clear reduction and restriction of citizenship of women, who are affected by the full exercise of individual, social, economic, political, and cultural rights on equal terms with men. These are the institutions, such as the family in particular, and through the establishment of gender relations, which contribute to the exploitation of women and the social reproduction of the labor force. Women bear a triple burden: wage labor, domestic work and care of children and people with disabilities or dependents (Iriart, Waitzkin, Breilh and Merhy, 2002).

For Bourdieu (2011) the social order tends to ratify male domination, relying on the gender division of labor, and assigning activities, places and opportunities based on gender. This is how the gender difference between men and women appears as a justification for social difference and the masculine appears as the measure of everything.

In this way, care is a social practice that has been assigned early to women, and then it has been objectified, internalized, and naturalized as a female activity, resulting in a pattern of expectation of what is expected. We can emphasize that gender, as a social and historical construct, becomes a pattern of expectations, establishes what is expected (or not), shapes the social and symbolic order of people (Bourdieu, 2011) and, in turn, operates as a factor of risk and inequities (Cardaci, 2006).

The lack of gender public policies affects the exercise of rights in parity of conditions with men, and differentially impact on women, as already noted above, constitute: "*low intensity citizenships*", "*limited citizenships*", "*citizenship for defects*".

The aforementioned illustrates how in the same society can be raised within it situations of people who enjoy all the credentials of citizenship and people who are denied or enabled the enjoyment of citizenship only passively, or Citizenship is translated into an aspect: as electoral citizenship (only to elect representatives), or it is constituted differentially (women, indigenous



peoples, trans people, minority ethnic groups, migrants). Situations in which people can be segregated, excluded from the rights of citizenship and public spaces of decision and power, with fewer opportunities in access and control of resources (material and symbolic) for the full exercise of citizenship (Ranciere, nineteen ninety five).

The aforementioned illustrates how in the same society can be raised within it situations of people who enjoy all the credentials of citizenship and people who are denied or enabled the enjoyment of citizenship only passively, or citizenship is translated into an aspect: as electoral citizenship (only to elect representatives), or it is constituted differentially (women, indigenous peoples, trans people, minority ethnic groups, migrants). Situations in which people can be segregated, excluded from the rights of citizenship and public spaces of decision and power, with fewer opportunities in access and control of resources (material and symbolic) for the full exercise of citizenship (Ranciere, 1995).

Balibar (2013) considers that in practice there are a series of graduations in active citizenship that form *diminished citizenships* or *second class citizenships*, *excluded*; these are not only excluded from the status of citizenship, but also excluded from capacity and power. It should be noted that in the dynamics of inclusion and exclusion the subjects enter the scene, and with it the relations between the subjects and the relations of force that are exerted both by the institutions and power apparatuses and by the individual and collective subjects. For this author, it is also those who "imagine" or "know" citizens who produce "non-citizens", because in this process they affirm the identity "we". For this reason, according to this author the inclusion of non-citizens will be possible through processes to democratize institutions on the one hand, but also through the work of the citizenry with itself (Balibar, 2013: 211).

It should be noted that there are different definitions and conceptions about citizenship; who, what rights it includes, what role the state has in front of them and how they come to be recognized and implemented. Citizenship gives a legal status to people, it is integrated with a set of rights but also with a set of responsibilities, citizenship is a legal construction, as well as social, political and ideological, to be reached. In this sense, it can be mentioned that citizenship is not natural, but must be constituted, configured and constructed. For this reason, social-environmental<sup>13</sup> interventions become

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13 AN: It is important to demystify the value of social interventions. So not all socio-environmental intervention is intrinsically "good", nor are they neutral. They can impact communities in a negative, stigmatizing, or iatrogenic way. It will be sought that these are technically correct, politically fair and ethically valid.



relevant given that they have the potential to constitute citizenship, or deny it through practices that reduce rights.

In this sense, each conception of citizenship emerged in a specific historical context and must be read as emerging from complex economic and social processes (Heather, 1990).

### III.- SOCIO-ENVIRONMENTAL INTERVENTIONS FROM A HUMAN RIGHTS PERSPECTIVE

We consider it relevant to point out that those who formulate interventions have to know the paradigms in which the legal system is based, the ideological ceiling of the national constitution, the values that it promotes (or not), the idea of well-being, the notion of interdependence of human rights, of environmental justice and citizenship that the State maintains or should sustain. It should ask about the ways in which the State organizes social participation; what hierarchy environmental education has; legal education, how access to information is regulated; what guarantees or national or supranational mechanisms are accessible for the protection of rights; to whom it includes and excludes; who are the guarantors; who has responsibility or mandate for the restitution of rights that may be violated; who will be allies; what role do civil society organizations, universities, academics have; what are the public policies that in other contexts have served to solve a similar problem; what role the communities have assumed in resolving a conflict, among other questions that must work as prior to the design of a participatory intervention (Unsain, Echegoyemberry, 2017).

Thus, socio-environmental interventions, as they are proposed as strategies for citizenship, cannot be alien to the conceptual framework of Human Rights that conditions and enables them. In this way, interventions cannot be a splintered activity of the State, of the responsible agencies.

Following Abramovich (2004), the rights approach does not take as a starting point the existence of people with needs that must be assisted, "*but subjects with the right to require certain actions, benefits and behaviors (...) Rights establish correlative obligations and these require mechanisms of enforceability and responsibility*". Therefore, in this perspective, actions towards the granting of power through the recognition of rights are addressed. Thus, to understand from the rights approach implies that "*the establishment of mechanisms of guardianship, guarantee and responsibility*" (Abramovich, 2004:

11). In this approach, rights not only have an individual, but a collective dimension. Urging and forcing states to prioritize actions, strategies directed towards groups most vulnerable.

It can be mentioned that some programs in which the human rights approach is characterized by applying both transversal and specific principles, namely: 1) gender perspective; 2) empowerment; 3) recognition of the normative framework of national and international human rights; 4) responsibility; 5) respect for difference to diversity; 6) equality and non-discrimination; 7) inter-governability; 8) intersectorality; 9) participation and inclusion; 10) coordination and articulation; 11) territoriality; 12) effectiveness; 13) sustainability; 14) enforceability and justice; 15) progressive realization, indicators and reference points; 16) maximum use of available resources, and 17) transparency and accountability (Human Rights Program of the Distrito federal de México).

The human rights approach urges and guides us in the elaboration of public policies based on thinking about strategies that contemplate social (or cultural) equality, positive discrimination, participation and empowerment (IPPDH, 2014: 3). The human rights approach raises "the centrality of the principle of equality and non-discrimination as a horizon of state interventions".

It should be noted that the international human rights framework provides socio-environmental interventions with an essential orientation to reverse situations of injustice, since as Gándara Carballido (2013: 13) correctly points out, human rights appear as the result of popular struggles, that can minimize the asymmetries that make abuses possible, not as state concessions, but because of the participation of those who recognize in their lives unworthy situations that must be reversed. Currently, Herrera Flores refers to the need to "reinvent human rights" from a reappropriation of the concept in a framework of critical thinking (...) in the sense of showing them as results of social, economic, political and cultural processes (...) serving as a matrix for new social practices that rebel against the unjust social order (Herrera Flores, 1989, in Gándara Carballido, 2013: 12).

Hence the importance of socio-environmental interventions approach a perspective from the integrality and interdependence of human rights (civil, political, economic, social and cultural rights), taking into account gender mainstreaming, and using *community legal empowerment* (as a way of being "with and in" the communities). The interventions cannot be isolated, decontextualized, welfare-oriented, individual, but must be thought within a broader social and collective process, arising in the territories themselves

where rights are being denied and in which institutionalized channels are not found of social participation.

In this way, the focus on environmental rights and justice prevents taking the environment and rights as a commodity, whether consumer, private, available, alienable and negotiable by the subjects (state or civil society). In this approach, *common goods* and citizenship are the central axes from which we must work from public policies, education and environmental communication (Echegoyemberry, Unsain, 2017).

We believe that socio-environmental interventions should be based on an ethic that seeks the enforceability of rights, the recognition and legitimization of communities as key actors in their struggle for a dignified life and the contribution to the suppression of the determinants that condition its possibilities of present and future development.

Thus, socio-environmental interventions are presented as a strategic tool for the redistribution of power and, consequently, the constitution of citizenship not only present but future.

#### IV. CRITICAL VISION: FROM AN ECONOMIC RATIONALITY TO AN ENVIRONMENTAL RATIONALITY

In this section we briefly present the postulates of a critical view from which we try to reflect on some gears in which the dominant economic and cultural model is based. This approach requires socio-environmental interventions, a passage from an economic rationality to an environmental one, because *"it generates a reorganization of production based on the productive potential of nature, the power of modern science and technology, and processes of significance that define cultural identities and existential meanings of peoples in diverse forms of relationship between human beings and nature"* (Leff, 1998: 35).

Socio-environmental interventions have the duty to question and criticize economic rationality, the dominant idea of progress and growth from the logic of the market.

In the same way it is summoned to adopt a systemic view, in which one can account for the interactions of the parties and the emergence of senses without subjugation of one sense over another and propitiating different ways of walking the path towards a sustainable development.

Thus, socio-environmental interventions must be rethought at every step so as to not get caught up in the logic of the market and to offer the environment as an object of consumption at the service of man, contrary to the Rights approach.

Faced with the need to move towards a new way of relating to nature and limit its unsustainable exploitation by the global market, in which women and girls suffer the differential impacts, various management methodologies associated with the intervention of stakeholders involved, among which is the one developed by Ostron (1995, 2011) who proposed increasing the participation of citizens in the self-management and governance of common-use goods in order to achieve greater democratic control that guarantees equity in access and use of them.

In this context, the ethical, aesthetic and political commitment to encourage new concepts of well-being and development that promote sustainable lifestyles and modes of production consistent with environmental rationality will be assumed.

Under this premise, it is possible to highlight the notion of *good living*<sup>14</sup>, a concept that has constitutional status in some countries of the region and that combines three central elements: harmonious development with oneself (identity), with society (equity) and with the nature (sustainability) (Cubillo Guevara, Hidalgo Capitán, 2015; Acosta, 2010).

In this sense, each community can specify the meaning of their own well-being, and this is where the main contribution of social interventions falls as a central tool to guide these processes, framed in the principles of social equity and environmental sustainability.

In this way, it is expected that socio-environmental interventions contribute to recognition, knowledge and legitimacy for the constitution of environmental citizenship, in line with the rights approach. Environmental citizenship cannot be constituted except on the basis of recognition of the interdependence of civil, political, economic, social and cultural rights.

Next, some characteristics and guidelines to be followed for socio-environmental interventions are postulated, and the challenges and opportunities to be

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14 AN: "Good living" was incorporated with a constitutional hierarchy in Ecuador and in the Plurinational State of Bolivia.

addressed for the constitution of citizenship and environmental justice from a human rights perspective are postulated.

#### V.-SOME BASIC GUIDELINES THAT GUIDE SOCIO-ENVIRONMENTAL INTERVENTIONS:

It is considered that the presented guidelines are transversal to all work instances (diagnosis, elaboration, implementation, evaluation, monitoring, and redesign).

The Social-Environmental Interventions (ISA) are presented not only in an instrumental sense, but as strategic dimensions that intervene in the construction of meanings.

As mentioned above, the ISA take as their object of intervention the interrelation of the environmental field. As the environment is a complex object, it implies assuming that it is a system in which a linear logic of determination (of cause effect) does not govern but circularity, recurrence, feedback, the blurring of space-time limits, disorder and uncertainty (Morín, 2001). This condition demands social-environmental interventions to promote a dialogue of knowledge (Leff, 2002) that allows for the intersection between technical, political and community knowledge, generating a body of knowledge that does not belong to any particular actor.

The first statement -the environment is a complex object- leads to propose a methodology for these objects. Thus, Almeida Filho (2008) argues the need for transdisciplinarity to address complex objects, which would allow an integrating response of different knowledge and would involve the joint construction of a problem, enabling a construction of the object from the polysemy of the crossings disciplinary discourses.

Thus, in interventions aimed at the community in general, it will intervene from the diagnostic stage, inviting the actors involved in the participatory definition of the problem, which cannot be limited to expert knowledge, excluding the perspectives of those who live it daily. That is why the need to design processes that allow a genuine social participation in this stage is highlighted, contemplating the provision of adequate, timely information, access to it as well as the adaptation of these contents to different ethnic, cultural and social<sup>15</sup> contexts (Unsain , Echegoyemberry, 2017).

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15 AN: An example of a strategy of education and legal empowerment to facilitate access to justice in a vulnerable population is the "Promoter Training Program for the Access to Justice" carried out during 2017 at Villa Inflamable (as a pilot experience with possibilities to replicate it nationally), whose participants

Involving the communities engaged in the design stage of an intervention on the commons will allow, in addition to addressing the problem from its different perspectives and edges, to approximate possible ways to resolve them and analyze the motives behind each assessment. These meetings will allow the aspirations of the group, their interests, positions, desires and ideas of well-being, security and will reveal conflicts and struggles.

A frequent error when this participatory diagnosis is lacking, is that it tends to homogenize the view towards a fictitious community (without distinguishing heterogeneity within a category, group, or community)<sup>16</sup>.

Together with the rights approach, social-environmental interventions have to incorporate gender *interculturality* and *intersectionality*, which implies understanding the territory from the social practices and meanings that are deployed in it, giving an account of the differences and vulnerabilities that arise in terms of gender, ethnicity, nationality, migratory situation, age, among others.

This holistic view embodied in an intervention will enable extended actions of the communities consistent with what is proposed in the operational messages, while avoiding "compensatory actions" resulting from simplistic and partial<sup>17</sup> messages.

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were mostly women. The program was prepared by the interdisciplinary team of the Civil Association for Equality and Justice (ACIJ). The Program was certified by ACIJ, the Ministry of Justice and Human Rights of the Nation (Department of Access to Justice), of the Ministry of Social Development of the Nation, and the Extension Secretariat of the Legal and Social Sciences Faculty of the Universidad de La Plata. More information available at: <http://calc.acij.org.ar/2017/10/03/formacion-para-promotores-de-acceso-a-la-justicia-y-empoderamiento-legal/>

- 16 AN: An example of this can be the partial approaches that are carried out by the State in the subject of waste, especially focused on an urban neighborhood hygiene approach, without considering its complexity and without considering how a specific community is linked to the waste. In this way, it leaves aside that waste represents in many cases a means of subsistence for urban collectors or cartoneros (through their recovery and sale) and also irresponsibly delegates in them an essential public service that the State must ensure to preserve a healthy and sustainable environment. The State makes this delegation invisible, which leads to the naturalization of the precarious situation in which many of them find themselves. Thus, approaches based only on the perspective of the State are at least fragmented and increase the conflict in the territory. Taking into account the perspective of rights and obligations in the preparation of strategies, implementation and evaluation, would allow resolving the conflict in the face of the collision of interests.
- 17 The Communication and Health Campaign on the Prevention of Dengue undertaken by the National State can be shown as an example of an erratic approach. In which the participation of the community in the problematic was overestimated and the responsibility of the State was underestimated. On the one hand, the main action was to "discard" without considering that many of the communities conserve and accumulate water because they do not have access to safe water provided by the state. The state managed the campaign in individual terms, without carrying out structural actions that modify the main determinants in relation to dengue (extension of the water network, cleaning of

In this same sense it is important that the intervention can make visible the shared but differentiated responsibility between the different actors in the mitigation of the environmental impacts, especially with the purpose of avoiding the apathy that can be caused by recharging each individual with the weight of the pending challenges.

From this perspective, it is also effective to highlight the power of aggregate actions to generate positive change; education and communication should tend to empower and strengthen communities, highlighting aspects such as community resilience, enhancing psychology aspects as well as legitimizing practices of self-care carried out by the community to solve its main problems, in real or imaginary terms.

Just like the aesthetic vision, both ethics and politics, are unavoidable axes in every approach that is carried out. And here, it is essential to promote the appreciation of beauty inherent in different ecosystems, as a necessary condition to promote care and conservation actions, whose first step will be the possibility of knowing and experiencing the value of our environment. This, without falling into a *folklorization* of the environment, or an essentialist or landscape view of the natural, that dismisses the cultural and historical mediations of a built landscape.

Another aspect to be undertaken from the interventions is linked to *community empowerment*, understanding it as the process by which individuals and groups acquire greater power over the conditions and determinants of their living conditions. This process, in its social aspect, "rather than improving information and inducing behaviors, should stimulate critical reflection and the capacity for intervention and co-management of social problems from individuals and groups" (Resende Carvalho, 2008), without disregard, in our opinion, the unavoidable responsibility that belongs to the State in the face of the main problems. The legal *community empowerment* allows expanding the communities' repertoire of action.

It should be noted that ISA must promote *legal empowerment*, since they allow the establishment of priorities based on the community; design strategies

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micro-dumps, eradication of macro-dumps close to the population, etc.). See analysis by Spinelli (2016) available at: <http://www.revistaanfibia.com/ensayo/baja-mortalidad-alta-desigualdad/>. Also educational programs for the prevention of dengue, elaborated per sector by the health sector (MSAL), that are not reflected in the school curricula, due to little or lack of interaction with the Ministry of National Education.

for urban integration; define a welfare model and to influence consumption patterns and sustainable production; it serves to organize relations of interdependence in pursuit of self-management and self-government of the common goods; fundamentally to define constructively the good living (*sumak kawsay*) of the local communities (Viteri, 2000; Acosta, 2010; Cubillo Guevara & Hidalgo Capitán, 2015); to reaffirm a strong sustainability, and to delineate an environmental identity as a means to convey demands.

In this sense, social intervention is constituted as a tool for the construction of citizenship and control of public environmental management, it allows to reduce the cracks of citizenship between: consecrated rights and their implementation, allows the confrontation between the formal legal plane - of equality- and the inequality of living in territories characterized by socio-urban and legal segregation.

Another of the fundamental guidelines, which in turn constitutes a real challenge to undertake in territorial work, is to be able to think of the interventions "from and with" the communities, in a symmetrical, dialogical way, in the instances of design, elaboration, implementation, evaluation, monitoring, and the redesign of public policies; which will involve the adaptation of processes, content and formats to generate legitimate participation and discussion.

In this sense, social participation and *legal empowerment* create the conditions for triggering processes of inclusion and citizenship broadening, recognition and effectiveness of existing rights, thereby reducing the cracks in citizenship (Echegoyemberry, 2017).

Thus it is not enough for citizens to have rights but to participate and exercise their rights in public spaces and to influence local agendas.

Although the environmental problems have a global character, it is convenient to represent them according to their local manifestation, relieving and respecting the social dynamics present in the affected community, in all its diversity, in order to generate greater identification and relevance, without losing sight of the unequal distribution of resources and inequity in the internationalization or globalization of environmental costs, which have the greatest impact in the least industrialized countries, and inwardly in the most vulnerable communities.



## VI. CHALLENGES FOR THE SOCIAL-ENVIRONMENTAL INTERVENTIONS DESIGNED "FROM AND WITH" THE COMMUNITIES

Below are some conditions or challenges so that social interventions can function as eminently inclusion policy tools, the precondition is that they arise "from and with" the communities.

Indeed ISA can be considered a political tool when the change they propose to store:

- 1) Reversing or trying to reverse the serious deficits in public policies of care, gender, and environment, thus tends to the recognition and constitution of citizenship, universal, social and environmental. In this sense, no intervention can be separated from Human Rights.
- 2) Promote channels of legitimate social participation: in the determination of priorities (political, technical, community), in the decision, self-management, collaboration and effective control of public policies
- 3) They promote "*the right to have rights*", "*claim the right to differences*" and the right to demand rights and transform them when they are unfair, through *community legal empowerment*.

Take account of the heterogeneity and differences in terms of social class, ethnicity, age, sex, migratory situation, identity, expression, sexual orientation, among others that can place people, groups or social groups in a situation of particular vulnerability, recognizing the plurality of *identity* inscriptions from *the right to differences*.

- 4) Encourage a culture of care that does not fall on women as the main resources, report the profoundly unequal and asymmetric power relations.
- 5) Give an account of the suffering and environmental injustice, without losing focus on the psychological aspects of the communities and addressing the protective factors (fostering social organization, support networks, integration of the social fabric, intergenerational solidarity, significant links, community identity, study of people, communities and collectives, triggering processes of recognition and legitimacy of the other, encouraging a culture of care, an ethic of care and an aesthetic of care, encourage the emergence of community leadership
- 6) Promote another form of relationship with the environment, based on a new ecological paradigm (NEP) allowing the gradual passage of an anthropocentric vision to an eco-centric one.

- 7) Address the complexity and uncertainty of environmental problems, without splitting from the territories, the contexts and the meanings that emerge in them. For this reason, ISA are situated contextually, therefore they need to be designed from strategic planning in order to situational identify alternative scenarios that ensure the political viability of technical interventions (Malthus, 1972, 1987)<sup>18</sup>.
- 8) We are challenged to assume a critical and reflective view of our practices in individual and social terms, for this reason they require a permanent work of construction and deconstruction of the disciplines and professions; which necessarily implies assuming new ways of knowing and validating a new epistemology, a process that will involve a cross-linking of technical, academic and community knowledge.
- 9) They require taking inter-subjectivity into account, since it presupposes a relational approach in which the recognition of the other as a subject is fundamental, which also leads to a dialogical approach, taking the other as a subject of rights, and not as a passive object, depository of actions and strategies. The socio-environmental interventions are those that involve and question us as subjects, for that reason they are experiential: "they are those in which we are while we are doing"

#### VI. TO CONCLUDE:

Emphasis has been placed on the need to think about socio- environmental interventions, care practices and citizenship from a gender and Human Rights perspective.

Likewise, some guidelines were made explicit to take into account for the elaboration of social interventions from a critical perspective, proposing some challenges for the design, elaboration and implementation of public policies "from and with" the communities. Some conditions were also mentioned in which social interventions can function as eminently political tools for inclusion.

Also as noted, the deficit of public policies on care cannot and should not be corrected by women's activity, it was pointed out how this deficit

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18 AN: We find numerous authors who formulate criticisms of normative, authoritarian, centralist, static, technocratic and top-down planning can be consulted: (Niremberg, 2013).

generates differential impacts that are expressed in environmental problems for women. Therefore, we must rethink the roles of care, deconstruct, denaturalize them, from an ethical dimension of care that includes women as a subject of law, contemplating: equity in the face of burden or dependency; the form of remuneration in the domestic sphere; the reassignment of responsibilities, the sharing and equitable retribution of care tasks and activities; incorporating fundamentally the responsibility of the State in the design and implementation of a care system.

It also highlights the need for public policies and socio-environmental interventions to address the differential impacts that arise from situations of environmental injustice, taking into account territorial and gender registration, as these condition the development prospects, the living and dying of people, groups and communities.

Inequalities, health, social, cultural and economic gaps make up cracks in citizenship, as they are constituted as restrictions, limitations and even denials of fundamental Human Rights. Reversing them requires a coherent political decision that is consistent with the values and principles of a state of law.

Therefore, it is proposed that the basis of social interventions take into account the aspects related to the care economy, the gender perspective and human rights, as they allow us to identify critical junctions that would otherwise seem isolated or not integrated in the same matrix: the inequality and inequity that arise from the same mode of capitalist production.

For all the above, socio-environmental interventions always challenge us to assume an ethical, aesthetic and political position, that is, to understand what is (good, beautiful, just) as part of the disciplinary field.

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GEERT HOFSTEDÉ'S MASCULINITY-  
FEMININITY PLATFORM IN THE  
ORGANIZATIONAL CULTURE OF  
THE TOURIST COMPANIES OF  
BAHÍAS DE HUATULCO, OAXACA

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Rocío Esquivel Ríos  
chio@huatulco.umar.mx

José María Filgueiras Nodar  
jofilg@huatulco.umar.mx

INSTITUTE OF TOURISM, UNIVERSIDAD DEL MAR (CAMPUS HUATULCO)  
SANTA MARÍA HUATULCO, OAXACA, MÉXICO

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— Abstract —

This paper exposes the results of a study of organizational culture carried out in the tourism destination Bahías de Huatulco (Oaxaca, México). After a brief introduction, it begins by presenting the conceptual framework of organizational differentiated by this author the one referring to masculinity - femininity. Subsequently, after making reference to the methodology, the results of the study are shown. Thus, the masculine dimensions of the platform (objectivity, critical thinking and efficiency) are exposed in the first place and in second place the feminine ones (humility, subjectivity and friendship). The article closes with some reflections, in which the predominance of masculine dimensions is established and, on the other hand, it attempts to link the results with gender equity.

**Keywords**

*Organizational culture, Geert Hofstede, Bahías de Huatulco, tourism, masculinity-femininity.*

The hotel companies in Bahías de Huatulco represent a complex sector in which the chains', usually foreign, business culture coexists with local cultures. In this environment, studying masculinity-femininity (and in general the five dimensions of the organizational culture pointed out by Hofstede) becomes an objective that can have a strategic value to improve the work environment, the effectiveness of the work, and in general the competitiveness of destinations, taking into account the importance of intangible factors for this.

Hofstede (1984) conducted a study of organizational culture during two periods 1968 and 1972, through 72 IBM affiliates in 53 different countries, with the idea of obtaining a possible improvement of human relations from a global perspective. This author points out that culture is an invisible part (of an organization) that is integrated by values shared by the majority of its members. Converted into norms of coexistence, they determine to a great extent the political and organizational solutions that are observed in a macro and micro way in each country. Thus, Hofstede (1984: 15) mentions that collective mental programs consist of certain stable patterns of thought, feeling and action, which makes possible to distinguish one social group from another.

In order to better understand what the author proposes, it is first of all necessary to specify the concept of organizational culture, differentiating it from general points of view about culture, such as the sociological definition provided by Vera and Rodríguez (2009)<sup>1</sup>. Later, the study of the masculine-feminine platform will be approached, that will help to identify if the people who conform the organizations are more inclined by some or other characteristics. In order to carry out this analysis, it was necessary to identify each of the characteristics of both sides of the platform, that is, the masculine and the feminine, then constructing a survey, which served to carry out the measurement. It is necessary to mention that this characterization could be questioned from a gender perspective; however, for the purposes of this

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1 One of these points of view would be the sociological definition of culture contributed by Vera and Rodríguez (2009), for whom it is a system of interrelationships between the individual ontogenetic processes, the social and historical ones of collective behavior in a time cut and the anthropological and historical ones that make possible the cultural products, including the artistic, daily, scientific, technological and folkloric manifestations. Viladot (2012) also offers an interesting conceptualization of the culture, as well as the different intellectual approaches with which it has been approached.

research, it was tried to maintain the original nomenclature of Hofstede, but bearing in mind that this "traditional" consideration of masculine and feminine is completely overcome.

After the development of the field work, the information obtained was analyzed under descriptive statistics. The results of this investigation will be presented below; however, firstly, a series of conceptual aspects about the masculine-feminine platform and also the organizational culture itself will be explained.

## 1. CONCEPTUAL FRAMEWORK

### *1.1 Organizational culture*

In the early 1980s, when the differences between the North American business management model and the Japanese industrial model were becoming more evident, the study of organizational culture began: Rodríguez (2009) mentions that Japan's leadership, in regards to quality and functionality of its products, was attributed to the characteristics of its culture, which led many researchers to study it.

This new perspective of the organizational culture developed by the aforementioned authors brings new research characteristics. Echeverría (2005) mentions that the organizational culture rejects the "schematic and excessively rational vision and assumes the thesis that organizational decisions and behavior are predetermined by basic assumption patterns, which underlie decision making and are maintained by members of the organization." The repetition of these patterns, and their unconscious assumption on their behalf, causes that the behaviors influence in the decision making.

In this way, the concept of organizational culture has evolved over time; with a view to an adequate contextualization of the same, two characterizations will be presented:

- Peters and Waterman (1984) quoted by Pérez (2009: 46) mention that "organizational culture is a dominant and coherent set of shared values transmitted by symbolic meanings such as stories, myths, legends, slogans and anecdotes".
- Díaz (2006) mentions that the organizational culture ate the "beliefs, whether they are invented, developed or discovered, that the groups judge as valid and allow them to adapt to the environment and integrate internally, as well as being taught the right way to perceive , think and feel your problems."

Having reviewed the previous definitions of organizational culture, it can be understood adequately for the purposes of this work as the set of values, ideas, beliefs and myths that occur within organizations based on the interaction of collaborators, who legitimize themselves and they are transmitted through the years, often unconsciously.

### 1.2 Masculinity-femininity according to Hofstede

The study carried out by Hofstede establishes five categories to identify the organizational culture, one of them is the aforementioned, masculinity-femininity, which, for Thevenet (2008), does not speak in a strict sense of who holds the authority, men or women according to the case, but of those societies in which certain values that traditionally have been considered masculine (affirmation of self, acquisition of goods, etc.) predominate, in contrast to other societies in which values such as concern for others or attention to the quality of life, which have been considered feminine.

In this way, Hofstede (1984) considers that the societies he calls 'masculine' are those that care about success and money, and in general about material aspects. These are competitive and aggressive cultures in the labor field, in which economic gains, recognition and status play a fundamental role. These cultures focus on individual achievement and accomplishment of tasks, while reinforcing differences between the sexes (Hofstede, 1991: 138). Hofstede (1991) asks why some cultures are more feminine or masculine, suggesting that this may be due to cultural heritage, that is, to the cultures that historically preceded it and to its more or less cooperative or warrior character. In a later text, Hofstede (2011) states that in societies considered male, there is usually a taboo about this dimension, taboo that in his opinion shows that it touches deep and often unconscious values, "too painful to be discussed explicitly".

On the other hand, Gilmore (quoted in Páez and Fernández, 2002), mentions that male cultures "value performance and competitiveness, as well as a classic virile image and therefore cultural masculinity could be associated with a greater "macho" culture, since men must show their excellence in acting."

The studies of Yogo and Onue (quoted in Moya *et al.*, 2002) on masculinity and femininity, conducted in Japan (considered a male culture by Hofstede) reveal that subjects speak "less of their emotions of sadness, shame and guilt. with their parents, relatives and couples, avoiding emotional problems. They talk even less about positive emotions such as love, confirming that they avoid

talking about emotions in general." Some countries that according to Hofstede fall into this classification are Japan, Hungary, Venezuela and the United States.

On the other hand, those societies that are characterized by having harmony within their organizations, in which they work as a group, the decisions are taken together regularly and not individually and the affective relationships within the organizations are common, considered feminine.

"The feminine cultures do not emphasize the differences of gender role, they are not competitive and they value the cooperation and the care of the weak" (Viladot, 2012). "The feminine cultures are more permissive, they value the quality of life more and they accept the complementarity of the sexes. Men suffer less from the anxiety to fulfill their role, being able to manifest more modesty and communicate more with women. Emotional well-being is higher in developed female cultures" (Arrindell quoted in Paéz and Fernández, 2016). Feminine cultures do not emphasize stereotypical gender behaviors, in addition to emphasizing interpersonal harmony and communal relations (Hofstede, 1991). Some countries considered female are Costa Rica, Chile and Guatemala.

Trying to show the differences between masculine and feminine cultures, Paéz and Fernández (2002) made a comparison, which is shown in the following table.

**Table 1.** Cultural differences

	High Masculinity	High Femininity
Values and attitudes	Material success. Money and material possessions are important	Take care of others. People and good relationships are important
Social behavior	Ambition and assertiveness, competition, fairness and performance	Modesty, equality and solidarity
Emotions	Low expressiveness and emotional experience. Low emotional support	High expressiveness and emotional experience. High emotional support

Source: Paéz and Fernández (2002)

Montt and Rehner (2012: 23) mention that masculinity can be understood with the phrase "live to work", precisely because these societies are focused on tasks and work. On the other hand, female societies do not give so much value to this characteristic and they expect to have leaders endowed with human warmth, as well as negotiations in which consensus is sought.

The theoretical considerations that have been presented served as a basis to identify the main characteristics to be evaluated in this research: success,

competences, individual achievements and few emotions for male societies; and equality, harmony, friendly relations, modesty, solidarity and emotional support for female societies.

In this way, the research will refer to the masculinity variable as typical of an aggressive and competitive society, where people (men and women) are objective, critical and efficient. On the other hand, we will study the feminine variable, which includes modesty, related to humility and subjectivity; the second indicator will correspond to the affective aspect of society, expressed through friendship relations.

After having exposed each of the characteristics that integrate both masculinity and femininity according to Hofstede, and before moving on to the presentation of results and methodology, a very brief reference will be made to the context of this study: the tourist destination of Bahías de Huatulco is the fifth and last of the Integrally Planned Centers developed by the National Fund for Tourism Promotion (FONATUR). Bahías de Huatulco is a destination which construction began in 1985, after the criticized expropriation of more than 21,000 hectares of land carried out a year earlier (Talledos, 2012). The destination includes nine bays and 36 beaches, it is provided with an international airport and a cruise ship dock. In 2013, there were 121 lodging establishments, offering a total of 4,066 rooms, mostly hoteliers with a high profile (SECTUR, 2013). Today it is already one of the main tourist destinations in Mexico, with 402,733 tourist arrivals in 2014.

Taking into account the importance that the organizational culture can have for the development of competitive tourism services, we want to highlight the relevance of the results that will be presented below, presenting one of the five dimensions differentiated by Hofstede.

## 2. METHODOLOGY

This masculinity-femininity dimension research is considered to be of a transectional-exploratory nature because there is a set of variables for a single situation. Hernández *et al.* (2006) mention that the purpose of exploratory transectional designs is to begin to know a variable or a set of variables (a community, a context, an event, a situation).

The information was obtained from a survey, designed after a cabinet work. In general terms, it is a descriptive work that included the entire universe or subjects of study (with 72 represented companies, public and private, all of

them dedicated to the provision of tourist services, formally) constituting not a sample but a census (Hernández *et al.*, 2006).

The questionnaire consisted of two clearly defined parts. In the first one, the person was asked to describe their position in the company (command or not), together with a series of identification data, while in the second part was dedicated to collect the views of the interviewee regarding the different dimensions of their perception of the masculinity-femininity platform, which will be explained below.

### 3. RESULTS OBTAINED

To present these results, the three male dimensions of the platform will be presented first, and then the three female dimensions.

For all the characteristics studied there is also a margin, sometimes significantly wider, of “don't know / no opinion” answers, whose meaning is still being weighed in depth. One of the most likely possibilities in this regard is that some participants in the study did not want to give answers about certain dimensions of the behavior of their hierarchical superiors for fear of possible reprisals (even though the research clearly established that the answers would be anonymous). There are also other possibilities, such as the recognition of the lack of proper information about such behavior or in some cases the lack of understanding of the question. Leaving this point clear, all the analysis that follows will focus on the answers that did opt for one or the other options exposed, considering that it is the material that can offer a basis for the characterization presented here.

#### 3.1 Objectivity

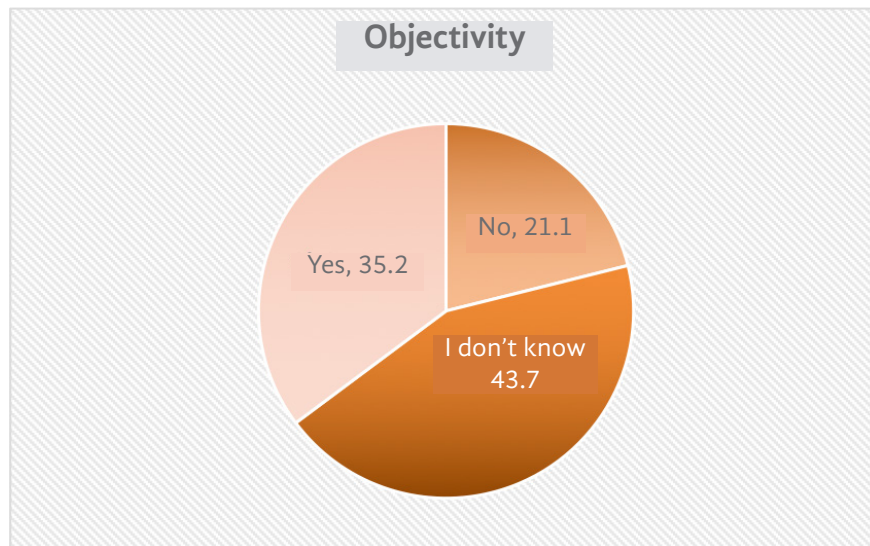
Objectivity, a concept that in philosophy is related to reality and truth, refers here to the state or quality of being true, outside the biases, interpretations, feelings or imaginations of an individual subject (Bolaños, 2002). This definition frames in a conceptual way the first questioning carried out during the field work, considering objectivity as one of the characteristics of masculine societies, according to what was expressed by Hofstede (1984).

Chart 1 shows that the surveyed subjects perceive that they belong to tourist organizations whose collaborators are objective people, that is, they base the decision making on the facts and not on personal rumors or impressions. Likewise, it was noted that conflicts within organizations



are recognized, but the subjects surveyed agree on the objectivity of the authorities to resolve these conflicts.

**Chart 1. Objectivity**



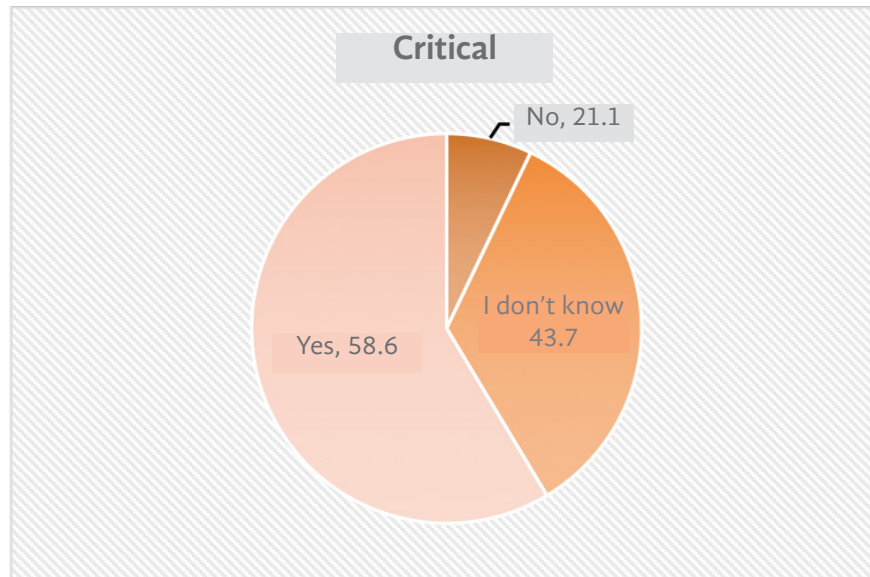
Source: own preparation with survey data (08/30/2016)

The previous chart shows one of the characteristics considered masculine by Hofstede that predominates in the tourist companies of destination: the objectivity of the decision makers, that is to say, the capacity to make decisions based on the facts and not of speculations or rumors. In this particular case, the persons interviewed mention that most decisions are made based on real events. This is also reflected in the chart, since (leaving aside the don't know / no opinion responses, as mentioned above), only 21.1% mentions that they are not objective persons.

### 3.2 Critical thinking

Critical thinking is considered the way of thinking (on any subject, content or problem) in which the subject improves the quality of their thinking by seizing the inherent structures of the act of thinking and subjecting them to intellectual standards (Richard and Elder, 2003 ). The questioning to measure this characteristic was developed in function of the perception of the collaborators about the way in which the decisions are made by the leaders of the organizations, that is to say, if they consider that they use or not the critical thinking, considered masculine by Hofstede (1984).

**Chart 2. Critical thinking**



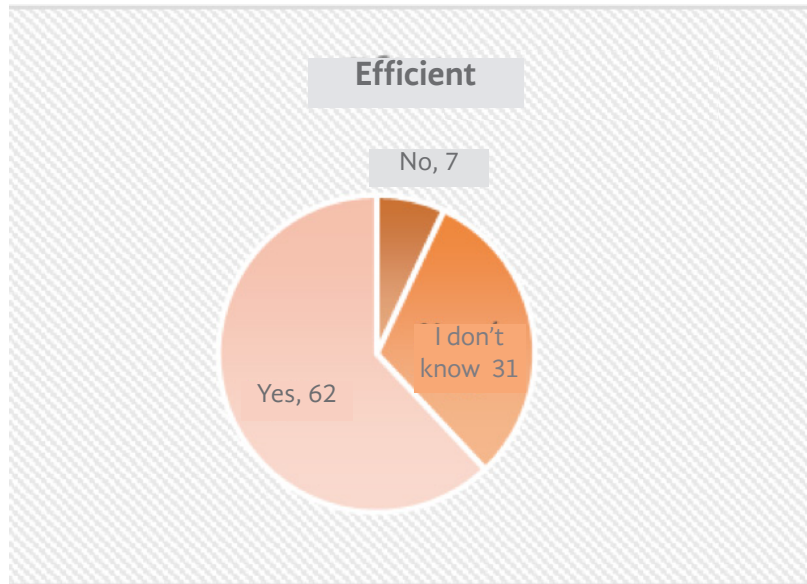
Source: own preparation with survey data (08/30/2016)

Chart 2 shows 58.6% of the responses estimate that decision making is based on critical reasoning. On the other hand, there is a low percentage regarding the negative perception (7.1%), so in general terms the perception of the employees is once again inclined towards the masculine characteristic.

### 3.3 Efficiency

Efficiency, according to Robbins (2002), is to do something correctly; refers to the relationship between inputs and products, seeking to minimize the costs of resources. Based on the previous characterization, it can be said that efficient people within the tourist companies studied will correctly use the resources they have, reducing costs and waste, and at the same time generating a quality service. The answers obtained regarding this item are the ones shown below.

**Chart 3. Efficiency**



Source: own preparation with survey data (08/30/2016)

62% of the people surveyed perceive that the people that make up the organizations of destination are efficient, that is, they make the most of the resources to obtain higher profits. With this reference is made to have competitive collaborators, who are capable to obtain positive results, making the most of the existing resources in the organization. The foregoing, of course, is favorable for companies because it can be obtained greater savings and at the same time a rise in profits.

The chart shows that only 7% of the collaborators surveyed perceive not having efficient people within the organizations, and 31% indicate that they do not have knowledge about it. Up to this point of the investigation three characteristics corresponding to masculinity have been determined. Next, those corresponding to femininity are measured.

### 3.4 Humility

Humility is the virtue that consists in knowing your own limitations and weaknesses and acting according to that knowledge. As noted by Llano (2006), it could be said that humility and firmness are made through a dialectical balance: a humble man can be firm, if he acknowledges the evidence even if it is contrary to his previous conceptions and even to his own self-image. Taking this into account, one of the feminine characteristics was measured obtaining the following results.

**Chart 4. Humility**



Source: own preparation with survey data (08/30/2016)

In spite of the well-known masculine characteristics explored up to now, in the survey some feminine characteristics also appear, like humility, although in smaller percentage. The foregoing is shown in Chart 4. 52.9% of the universe investigated considers that humility is a value that is constantly practiced in the institutions of destiny. This characteristic corresponds to the femininity of the organizations, since the organizations belonging to this classification give greater attention to values, feelings and personal relationships. It should be remembered that this questioning refers to modesty, in the way Hofstede (1984) relates it to people who have no interest in flaunting their personal achievements. However, recognition, encouragement and incentives remain a fundamental part of organizations.

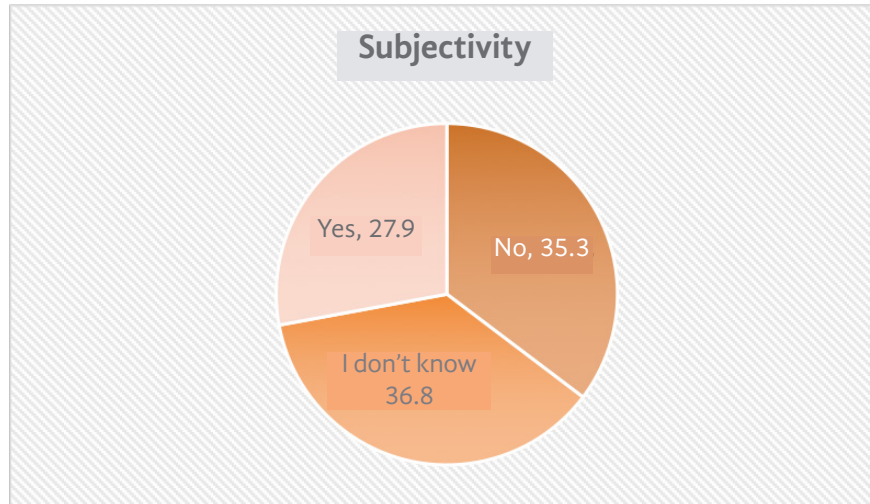
Humility is considered a social value, since it speaks of the little presumption of the people with respect to the obtained achievements. According to Hofstede (1984), this value is part of the feminine characteristics, in view of the fact that is contrary to the aggressiveness that, in his opinion, represents the masculine gender. At the same time, it is important to remember that when we talk about masculinity or femininity, we look at the characteristics focused on the organization, always according to Hofstede, and not on gender issues.

### 3.5 Subjectivity

Subjectivity is opposed to objectivity. It corresponds to the subject establishing an opposition to the external, and a certain way of feeling and thinking

that is proper to it. In other words, it refers to the primacy of the particular perceptions of individuals over some situation. Chart 5 measures the subjectivity on the part of the members of the tourism companies.

**Chart 5. Subjectivity**



Source: own preparation with survey data (08/30/2016)

It can be seen in the chart that 27.9% mentions that within organizations they do have subjective people; while 35.5% mentions that this is not the case. These results correspond to those of section 3.1, where the outstanding perception is that of having collaborators and decision makers that are based on objectivity and critical thinking.

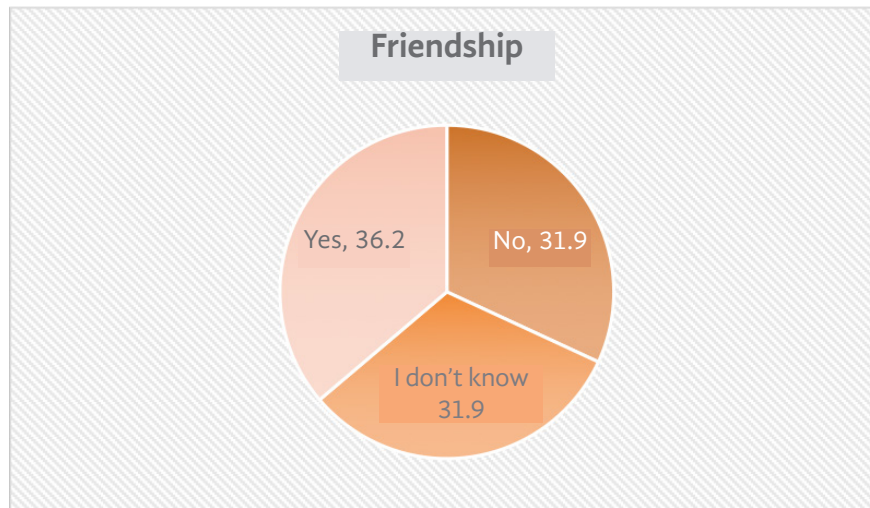
According to Hofstede subjective individuals are those who show greater interest in keeping appearances and not generate conflict, so their decisions are made in terms of people and not the facts, which is a female trait. Therefore, for this classification, the results are also inclined towards the masculine trait.

### 3.6 Friendship

Friendship is an affective relationship that can be established between two or more individuals, to which values such as loyalty, solidarity, unconditionally, love, sincerity, commitment, among others, are associated; and it is nurture with assiduous treatment and reciprocal interest over time (Cucó, 1995). Maintaining friendly relationships is a prominent feature of the organizations that Hofstede considers feminine. In fact, this characteristic represents one

of the fundamental pillars of the same, because it avoids the appearance of conflicts. This is reflected in chart 6.

**Chart 6. Friendship**



Source: own preparation with survey data (08/30/2016)

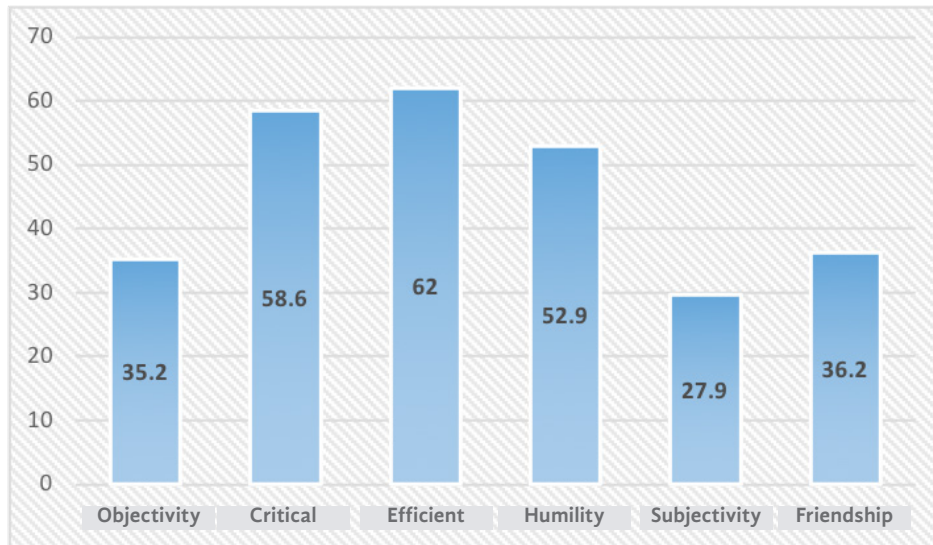
For this characteristic, 36.2% of the universe affirms that relations of friendship are effectively found within the organizations for which they work, which is a trait considered feminine by Hofstede. However, this feature must be nuanced, to note that such relations of friendship are not capable of influencing decision-making. It is important to remember that previously the subjects surveyed said that the people in their organizations are objective and critical, which contrasts with this characteristic; that is to say, the friendship relationships that occur within organizations are taken into consideration, but they are not able to motivate decision-making.

For a better understanding of the previous charts, each of the results obtained in the surveys is shown below. In this chart, each of the characteristics corresponding to the masculine vs. feminine concepts is clearly identified. The two highest results correspond to efficiency and critical thinking, two traits considered masculine and that seem to dominate the panorama of the organizational culture of Bahías de Huatulco. Third place is occupied by humility, with a percentage also relevant, which is close to the previous two, which shows the existence of this feminine characteristic in said organizational culture. In fourth place, and at a greater percentage distance, friendship appears, another trait considered feminine but, as just explained, hardly influences decision-making. The last two elements are objectivity



and subjectivity, with greater relevance on the first, considered masculine. Taking into account these results, it can be inferred that the organizational culture held at the destination is inclined towards what Hofstede calls 'masculinity'. Despite this general inclination, companies also show the existence of some elements considered feminine.

**Chart 7. Summary results**



Source: own preparation with survey data

#### 4. FINAL THOUGHTS

Hofstede (1984), in his original research, considered Mexico a country with masculine characteristics, which means that emphasis is placed on materialism and competition. People within organizations are critical, because they base their decisions on facts and at the same time they rarely tend to express their emotions. In the case of this investigation, it is considered that the results were not so divergent, since the most outstanding characteristics of the organizational culture of the tourist companies of Bahías de Huatulco belong to the masculine platform.

The way of working of collaborators within such companies tends to efficiency; at the same time, these collaborators are objective, since they consider that the decisions are made based on the facts. On the other hand, the participants in the research have also shown themselves to be critical, that is, capable of making constructive judgments towards others, in order to improve, and capable of receiving criticism.

It was also possible to identify a feminine side in the organizations, with the relevance of the 'humility' trait, with which the collaborators of the tourist companies have no interest in noting their personal achievements and are considered people with little presumption. Even so, femininity traits appear to a generally lesser degree.

Therefore, after observing the survey data, it can be affirmed that the organizational culture of the Bahías de Huatulco tourism sector possesses characteristics of those considered masculine by Hofstede, since it values the efficiency in labor issues and the people who are part of the organizations in this region are critical and objective, leaving the issues of friendship in the background.

In this article, reference has been made to Hofstede's considerations about the organizational culture, voluntarily excluding any comments from the point of view of gender equity, because they are very different issues. However, delving into the subject from that point of view would also be of great interest and would result in a greater understanding of the organizational culture of Huatulco, which is, as has been suggested, a strategic element for the competitiveness of tourist destinations.



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THE ADMINISTRATIVE  
LIMITATIONS TO THE HUMAN  
RIGHT TO IDENTITY. THE CASE OF  
THE MEXICAN OUTER SERVICE

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Alma Alejandra Soberano Serrano  
alma.soberano@uabc.edu.mx

FACULTY OF ADMINISTRATIVE AND SOCIAL SCIENCES OF THE UNIVERSIDAD  
AUTÓNOMA DE BAJA CALIFORNIA CAMPUS VALLE DORADO, MÉXICO



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— Abstract—

This paper is aimed to recognize the administrative limitations on the Human Right to Identity that currently occur within Mexican Consulates, since the issuance of consular registration of undocumented Mexican migrants is hindered by requesting a Certificate of Identity. It is based on a review of the concepts of Right to Identity and its processing through official documents, mainly consular registration, evidencing that the conditions under which migration operates show the ineffectiveness of the Identity Certificate requested, so it is suggested that through the area of Notarial Functions of the Mexican consulates the faith of knowledge be granted, which would allow that the Mexican official empowered for these effects is made the testimonial act that allows to recognize and identify undocumented migrants residents within their territorial circumscription, thus guaranteeing by the State the Human Right to Identity.

### Keywords

*Identity; Human Rights, Faith of knowledge, migratory policies, mexican migrants.*

## HUMAN RIGHT TO PERSONAL IDENTITY

With the Constitutional reform that was verified in 2011 in Mexico, a paradigm of Human Rights emerged that has meant, to our legislation, a series of interpretations that require multidisciplinary knowledge and more extensive to those used in the national territory, such as the one that occurs in Article 4 of the Political Constitution of the United Mexican States, in which the Right to Identity is stated in the Mexican Positive Law, circumscribing this Right to the immediate registration of children's birth. However, the Right to Identity consists of actions that go beyond just recognizing someone's moment of birth, in turn implies a sense of belonging to a family, to society, to the State of origin and contains accordingly elements as fundamental as respect for freedom, human dignity and the right to legal security.

In Mexico there is no legal definition of the Right to Identity, so, to understand its content, it is required to go to other disciplines that do, considering for example psychology, which refers to identity as the subjective and individual element of each person; which constitutes the human being *per se*, and that is becoming more complex and modified throughout human existence (Research Center for Peace, CIP-FUHEM, 2017).

For sociology, identity has a double character, what the individual perceives of himself and what the social group to which he belongs recognizes about him. One of the main goals in cultural politics of the Mexican State is to recognize the cultural content of the native peoples; since it rectifies the national identity and at the same time straightens the speech of a mestizo nation based on cultural syncretism and the dominant anthropological ideology, as well as dealing with the decision-making of the destiny that is posed and conducted for their community (Stevenhagen, 2001).

In the field of Law there is a recognition of attributes that are specific to individuals, which, once integrated, make them have "legal personality" and, therefore, be subjects of Rights and Obligations; within these attributes are both the name and nationality of people, which takes part of what is explained by psychology about the individual's identity and their belonging in a group or society, without establishing the definition of the personal identity, being able to only enumerate the "components" of an individual.

The application of the "International Convention on the Rights of the Child" (SRE, 2017) was ratified and recognized within our country since 1990, in which the Rights to Identity, to the name and nationality are highlighted as

essential for each child, interpreting that through the timely registration of birth minors are granted the legal security they require. As a commentary on the case, our country still has a 6.6% lag of children who are not registered before the first year of life, which intensifies in poor rural or indigenous areas (UNICEF, 2017).

Within this same order, article 8 refers to the Right of Identity through the commitment of the States, which are bound to respect and preserve nationality, identity and even family relations.

In the Mexican Positive Law, it corresponds to the Supreme Court of Justice to make the interpretation of those rules that require a process of clarification, as in the case that occupies us the concept of Identity within our legal framework, thus, the ruling issued by this body establishes that the elements that make up the legal identity are the name, nationality and a filiation:

CHILDREN'S RIGHT TO IDENTITY. It is a right of constitutional rank that derives from article 4 of the Federal Constitution, since the objective of the reform to this precept consisted in recognizing as constitutional rights all the rights of children established in the various international treaties that Mexico has signed. Thus, since the right to identity is recognized in articles 7th and 8th of the Convention on the Rights of the Child, its constitutional rank is undeniable. Likewise, according to these precepts and article 22nd of the Law for the Protection of the Rights of Children and Adolescents, the right to identity is composed of the right to have a name, a nationality and a filiation. Indeed, although identity is constructed through multiple psychological and social factors, in terms of rights, the person's own image is determined to a large extent, by the knowledge of their origins and their filiation, as well as by the identification that they have in society through a name and a nationality. From the determination of said filiation, different rights of the child, such as food and inheritance rights, are also derived.

Interesting in this jurisprudential text, is the connection that is made of the national legislation, from the Political Constitution of the United Mexican States to the Law for the Protection of the Rights of Children and Adolescents, as well as the enumeration of the components to the identity and its connection to fundamental civil and family rights for the full development of the human personality.

The content of the Right to Identity within our legal system can be found in article 19 of the General Law on the Rights of Children and Adolescents (Deputies, 2017), which although it is not a defined concept, is enumerated,

that is to say, they refer the requirements or attributes that are recognized to said concept, being these:

- I. To have the name and the surnames that correspond them, as well as to be registered in the respective Civil Registry immediately free of charge, and to have the first certified copy of the corresponding birth certificate expeditiously and inexpensively issued, under the terms of the applicable provisions;
- II. To have a nationality, in accordance with the provisions of the Political Constitution of the United Mexican States and international treaties;
- III. To know their affiliation and origin, provided that this is keeping with the best interests of children, and
- IV. To preserve their identity, including name, nationality and cultural affiliation, as well as family relationships.

The fact that this recognition is made from the perspective of childhood stands out. It is easy to understand that the administrative perspective of this Right is perfected the moment a child is registered, hence through this official administrative document that is, through the Birth Certificate, granted by the Civil Registry the Right to Identity is presented and hold.

In this regard the Federal Civil Code in force in our country, general and mandatory order in the matter of recognition of the attributes of a person; that is to say of the name, nationality and affiliation of the person, as well as of the existence of the Civil Registry and the registration of births and processing of birth certificates, establishes within its numerals the processes, requirements and conditions necessary to obtain recognition to the Right to Identity, highlighting then that for our legal system there is no other document that guarantees the identity of a person other than the Birth Certificate. This is especially important when referring to migrants, nationals abroad who must prove their identity to foreign authorities and have the status of undocumented.

Identity, considering the attribute of nationality, implies from a sociological perspective respect and recognition of culture, language, traditions, history and common life; and from a legal perspective it also means belonging to a State, the condition of National and the protection that the State grants to its nationals inside and outside its territorial space, having as main effects the recognition of Political Rights, the granting of documents of national identity such as the passport or consular registration, as well as assistance and protection in diplomatic or foreign matters.

In the international field of Human Rights, the American Convention of Human Rights establishes in its 3rd article the Right to the Legal Personality, in its article 18th the Right to the Name and in the article 20th the Right to a Nationality, considering that all the signed countries of this convention are obliged to respect the principles established therein without any discrimination; therefore, it is understood that this obligation to respect rights is extended to the state agencies responsible for enforcing them in accordance with the powers expressly conferred for that purpose.

A person who has an established identity and recognized by their government abroad, can count with not only the Human Right to identity, but also with their own Social Inclusion rights, including economic and political inclusion in the place where they live.

It is worth referring the meaning given by the Supreme Court of Justice of the Nation within the text commented and published on the Right to Identity (Steiner, C; Uribe, P, 2013); in this text, the interpretation given by the Inter-American Court of Human Rights, in which the Right to Identity is consubstantial to the human being, is taken up, granting it, together with the recognition of this Right, the possibility of materializing the Right to the Legal Personality, and noting that the refusal to recognize it hinders the full exercise of political, economic, social, political and cultural rights of individuals. This Right to Identity protects each person against the violation of the "personal life" of each individual.

In the same way, and in the jurisprudential scope, the Inter-American Court of Human Rights (2005) has pronounced itself with respect to the consequences that imply the denial of nationality to people and their extreme vulnerability, as well as the vulnerability that individuals have even in their Right to Dignity, the lack of recognition of their legal personality, estimating the need for the States to implement the mechanisms and processes required to achieve the Right to Recognition of the Legal Personality.<sup>1</sup>

We cannot ignore the International Covenant on Civil and Political Rights (SEGOB, 2002) which establishes in article 24.2 the Right of all children to

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1 Judgment of September 8, 2005 of the Case of the Yean and Bosico Girls vs. the Dominican Republic in which it refers to the international responsibility incurred by the State for denying the issuance of the birth certificates of the girls Dilcia Oliven Yean and Violeta Bosico Cofi and the harmful legal consequences generated by said omission.



have a name and their registration in the Civil Registry "immediately after" their birth, or the article 24.3 that grants the right to acquire a nationality, considering both the recognition of legal personality.

To understand the scope of the Right to Identity, it must be clear that this is not just about the life, the feelings and the being of an individual conceived by himself as someone unique and different, but it also refers to the rest of the society, all those who he knows, those who interact and relate to him; legally speaking, these attributions are given when we recognize him by his name, his nationality, his age, his marital status, and, therefore, we and the State grant them the right to be protected as an individual and as part of a superior entity that recognizes them as part of it.

The Right to Identity also refers to Human Dignity; it is a basic and fundamental Human Right that, due to its implications, both local and international, should not be suspended, repealed or extinguished and it is especially important when it refers to the protection of migrants. In this sense, the International Convention for the Protection of the Rights of All Migrant Workers and Members of Their Families (SEGOB, 1999) in Article 24 establishes the full recognition and protection of their legal personality and in 29 they endorse the right to name and nationality.

Therefore, it is clear the content, scope and importance of the existence of official national documentation that effectively grants protection to the Right of Identity as belonging to a family and a State is much more important when it comes to citizens that are in an undocumented status in other countries.

The value of having a document that gives the quality of a person, that is, that includes the rights of identity and personality to a citizen, as well as showing their status as a citizen despite not having legal documentation to be considered legal resident in the country of destination, makes that within our legislation the Nationality Law in its third article, numeral VI originates a document that identifies Mexicans as nationals, the "Consular Registration", same as it is issued by the Ministry of Foreign Affairs and grants undocumented nationals abroad the exercise of certain economic, social and even cultural rights through this identification.

## CONSULAR REGISTRATION

The consular registration is, according to what is established in the second article of the Regulation of the Consular Registration, *the identity document issued by a consular office in favor of a national to show that in the registry*

*of Mexicans it is registered for residing within its circumscription, granted through the de facto recognition of the identity, address and nationality or belonging to the Mexican state of the person who owns it.*

This document serves citizens living abroad not only as a certificate of nationality, but in practical life, it is the only legal document in which they demonstrate having an address and, by having a photograph and a term of five years, sometimes it is also the only proof they have to identify themselves as who they are, that is, their identity according to what has been indicated in the course of this article; in addition, as it's valid for five years, it is also the ideal document to open bank accounts and, in some cases, obtain driver's licenses despite being undocumented, as it is done in the United States of America.

In the Regulation of the Consular Registration, Article 5th lists the requirements for requesting said document, highlighting for this article the numeral IV. "Present identification with photograph", requirement that is detailed more in depth in the fraction IV of the article 9th of said ordering, the one that indicates:

- "IV. Verify your identity with any of the following official IDs with photograph:
- a) ID issued by the Federal Electoral Institute;<sup>2</sup>
  - b) Mexican driver's license or from a locality in the consular office circumscription;
  - c) Passport, and
  - d) Any other document that in the opinion of the consular officer establishes the identity of the applicant

The Passport and Travel Identity Documents Regulations establish in its Article 14 a more detailed relationship of the proof of identity, the possibility of proving the Identity by means of an official document that contains the specifications established for this purpose by the Ministry of Foreign Affairs that allow its interpretation through relevant administrative provisions; with this, the document called "identity constancy" arises.

When the interested party comes to the Mexican consular offices in the United States of America and does not have the documents listed in article 14

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2 This identification document is currently issued by the National Electoral Institute, following the Constitutional Reform on electoral political issues published on February 10, 2014, in which the name of the issuing Institute was modified.

of the Passport Regulation, he is directed to obtain a Certificate of Identity through his municipality of origin.

In this document, whose format can be obtained in the pages of certain consulates of Mexico, it is also indicated to the applicant that it is necessary to attend personally (which in the great majority of the cases is an undocumented Mexican citizen, therefore requires enrollment) or one of his relatives living in Mexico with a recent photograph to the Municipal Presidency of his locality of origin and accompanied by two witnesses who know him and who reside in that locality, to request his certificate to be issued in his name.

This procedure considered of possible identification, as the legislation says in the opinion of the consular officers, means in everyday practice a series of obstacles and impediments of daily life that makes undocumented citizens choose not to continue with the procedure. In most of the cases undocumented people of indigenous communities are the ones who try to carry out this process, most of those have more than 10 years of having left their origin town or are women.

#### FAITH OF KNOWLEDGE

During the past summer and as a result of a research stay held at the Orlando consulate in Florida, the socioeconomic survey implemented indicated that the indigenous migrant population of Hidalgo and Chiapas has significant representation. The migrants interviewed mostly went through the procedures of consular registration and passport; however, at the time of requesting the necessary documentation to carry out the needed procedure and make it clear that they did not have any of the official documents to identify themselves according to the law; the migrants claimed that they could not get the "Proof of Identity", because either their community of origin is distant from the municipal presidency, their family members in Mexico are very old, or if they find any witnesses willing to make the trip to give their testimony to the municipal authority, it's unlikely they recognize the migrant, since they have not seen them for many years, so the photograph shown "may not look like" the person who they remember when they left.

In several cases, the migrants indicated that they had a birth certificate that stated that they are Mexican and that they even had relatives or friends who could state that could recognize them as who they say they are.

In addition to the foregoing, and in accordance with the provisions of Article 87 of the Foreign Service Law, the Mexican Consulates have an

area of exercise of notarial functions in which they have public faith to: "authenticate, notarize and revoke contracts of mandate and powers, open public testaments, acts of repudiation of inheritances and authorizations granted by those exercising parental authority or guardianship over minors or people unable to take care of themselves, provided that such legal acts are celebrated within their Consular Circumscription and are intended to have effects in Mexico."

From the previous analysis, it is clear that the public faith that may be granted by the Consulates to their nationals abroad is limiting, especially in regard to its effects. However, in light of this scenario and derived from the evident need to make the Human Right to Identity prevail, especially of migrants who find themselves in a situation of extreme vulnerability when they cannot present any document that identifies them, it is proposed that the Consulates grant the "Faith of knowledge". Such case already exists in the Argentine Law, in which public officials can grant the "Faith of knowledge", stating that the person before them presents themselves with witnesses, and known for such effects as "witnesses of knowledge".

In this Law it is indicated that when granting the public instruments to carry out the process, they state that they know those who are presented before them, that is, they come with suitable elements such as witnesses to obtain the knowledge of faith.

In our country, Vargas Aceves (1999) proposes that within the Notarial functions performed be indicated instead of "THE SUBSCRIBED NOTARY CERTIFIES AND GIVES FAITH TO KNOW THE COMPETENT" the phrase "identifies the grantors", which for purposes of this work is achieved with the two witnesses accompanying the conational to the corresponding procedure to later obtain the consular registration.

## CONCLUSIONS

The Human Right to Identity is not yet recognized within our national legislation, which makes it necessary to resort to international systems, instances and jurisprudence in order to conceptualize it and appeal it within our Law.

This normative omission leads to conceptual errors that worsen in undocumented migrants who need to identify themselves in the countries to which they emigrate. It is necessary to reassess the importance of having a consular registration or a passport for those who live without documents in a foreign country; the fact that it is an administrative provision that hinders the

right to recognize the nationality and the name of an individual abroad implies a serious omission and regression in Human Rights.

Migrant attention policies must be sensitized in relation to the population they serve in consulates and embassies, considering the realities that prevail when it comes to migrants who are indigenous, who did not finish their studies, who have left their communities years ago, and that if they have relatives who still remain in them, they are far from the municipal capitals, which makes it impossible in several cases to obtain documents in the municipal presidencies.

There is an area empowered to provide public faith within the consulates, therefore, it would be possible to reform the legislation of the Mexican Foreign Service to grant faith of knowledge before the appearance of two witnesses for the purpose of obtaining the consular registration and the passport and, this way, guarantee the Right to Identity of undocumented migrants.

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OPTIMIZATION OF THE AQUEOUS  
ENZYMATIC EXTRACTION OF OIL  
FROM *OECOPETALUM MEXICANUM*

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Sandy Luz Ovando Chacón  
ovansandy@hotmail.com

Guillermo Efrén Ovando Chacón

Dulce Alhelí Borraz Castañeda

Rocío Meza Gordillo

INSTITUTO TECNOLÓGICO DE TUXTLA GUTIÉRREZ,  
TECNOLÓGICO NACIONAL DE MÉXICO, MÉXICO



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— Abstract—

In the present work, the bromatological composition of the cacaté seed (*Oecopetalum mexicanum*) was analyzed and the process of aqueous enzymatic extraction of the oil was optimized. The enzymatic preparations Crystalzyme Cran and Cellulase were evaluated to determine their influence on the oil extraction yields of *O. mexicanum*. The experimental part was developed in two stages, the first one evaluated the effect of the variables type of enzyme, enzyme concentration, particle size and incubation time by means of an experimental L8 type Taguchi design, the second stage was to optimize those variables that influenced the oil yield, through a Box-Benhken design. The results of the bromatological analysis showed that the cacaté seed contains  $39.25 \pm 0.33\%$  oil. An increase in oil extraction was observed using the Crystalzyme Cran enzymatic preparation at  $50^{\circ}\text{C}$ , with a solid:liquid ratio of 1:5. Optimal conditions for the extraction of *O. mexicanum* oil obtained by the Box-Benhken experimental design were agitation speed of 89 rpm, enzyme concentration of 0.5% and particle size 0.595 mm with a yield percentage of 150.

### Keywords

*Oecopetalum mexicanum*; oil extraction; aqueous enzymatic process; comercial enzyme preparation.



Oilseeds are characterized by their content of high quality fats or oils, and the method used for their extraction is an important stage for their commercialization. There are several alternatives for the extraction of oil which have a direct effect on the extracted performance and the quality of oil obtained; being extraction by solvent and by pressing the most used processes at the industrial level (De Moura *et al.*, 2008; Latif and Anwar, 2008; Do and Sabatini, 2010; Li *et al.*, 2013). However, the use of solvents for oil extraction has been shown to have several drawbacks such as damage to the environment (Taha and Hassanein, 2007; Zhang *et al.*, 2010), low oil quality (Latif and Anwar, 2011), safety issues due to the use of solvents (Latif and Anwar, 2008) and low quality of the residual flour (Latif and Anwar, 2011; Li *et al.*, 2013) important reasons that have renewed interest in the search for eco-friendly alternative extraction processes (Li *et al.*, 2013; Mojtaba and Fardin, 2013).

In the last decade several researches have been described concerning the aqueous extraction of vegetable oils assisted by enzymes, such as the extraction of coconut oil (Mohammad *et al.*, 2015; Agarwal and Bosco, 2017), cotton (Taha and Hassanein, 2007), *Moringa concanensis* (Latif and Anwar, 2008), grapes (Guerra and Zúñiga, 2003), soybeans (Kapchie *et al.*, 2008; Kapchie *et al.*, 2010; Mohammad *et al.*, 2015), olive (Ghodsvali *et al.*, 2009), palm oil (Teixeira *et al.*, 2013), among others.

Enzymatic aqueous extraction has emerged as a promising biotechnological tool, competent for the extraction of oil from various oleaginous materials (Latif and Anwar, 2011; Lianzhou *et al.*, 2011; Li *et al.*, 2013; Kumar *et al.*, 2017), offering several advantages compared to conventional extraction, due to the specificity of the enzymes and the moderate operating conditions, mainly their action at low temperatures (Soto *et al.*, 2008; Ahmadi *et al.*, 2013; Li *et al.*, 2013; Mojtaba and Fardin, 2013). The main function of the enzymes during the aqueous extraction of oil is to digest through hydrolysis the structure of the polysaccharides such as cellulose, hemicellulose and proto-pectin that form the cell wall of oilseeds increasing their permeability (Soto *et al.*, 2008; Kapchie *et al.*, 2010; Silvamany and Jahim, 2015) and, as a consequence, efficiency and extraction performance (Rathi *et al.*, 2012) of the oil and phenolic compounds retained in the cell wall matrix (Soto *et al.*, 2008) or proteins that form the cell membrane and lipid bodies (Taha and Hassanein, 2007; Latif and Anwar, 2008; Soto *et al.*, 2008) are improved.

At present there are commercial food grade enzymatic preparations with multiple activities such as cellulase, hemicellulase and pectinase; which are applied to oilseeds in order to hydrolyze the components of the tissues cell

wall (Ahmadi *et al.*, 2013; Agarwal and Bosco 2014). The appropriate choice of enzyme preparation depends on the structural composition of the oilseed cell wall to be treated to ensure an efficient oil extraction (Yingyao *et al.*, 2008; Amante *et al.*, 2012; Rong *et al.*, 2017). On the other hand, reaction conditions such as particle size, enzyme concentration and reaction time are factors that also influence the degree of hydrolysis and effectiveness of the process (Kumar *et al.*, 2017).

The wide demand of vegetable oils for the purpose of use in the food and pharmaceutical industry has mainly, led to the search for new sources of native oilseeds as unconventional alternatives for the extraction and obtaining of oil. Mexico is a country that has a great wealth and biodiversity of native plants whose use potential is still unknown due to the few studies that have been carried out (SAGARPA, 2007). In this context, an arboreal plant known as cacaté (*Oecopetalum mexicanum*) is cultivated in Chiapas. It has been scarcely studied despite its attractive content of oil present in its seeds, and it could be considered as a viable unconventional alternative for oil production (Jimenez *et al.*, 2013).

The cacaté or cachichín (*Oecopetalum mexicanum*) is an edible wild fruit that is distributed in the Mexican southeast (Veracruz, Chiapas and Tabasco) and Guatemala. A preliminary analysis of the cacaté seeds indicated that it is rich in oil, with contents similar to those presented by some oleaginous seeds recognized as soy, olive, avocado and corn (Ballinas *et al.*, 2009).

Therefore, in the present work the process of aqueous enzymatic extraction was optimized to obtain oil from the cacaté seed.

## MATERIALS AND METHODS

### *Raw material-Geographic location of the collection*

The cacaté seeds (*Oecopetalum mexicanum*) were obtained in the local market of the municipality of Tecpatán, a town in the state of Chiapas, Mexico; whose geographical coordinates are 17°08'10" N and 93°18'40" W, at an altitude of 320 meters above sea level. The climate of this municipality is warm-humid. To the north, it borders with the state of Tabasco and the municipality of Ostuacán, to the east with the municipalities of Francisco León, Copainalá and Ocoatepec; to the south, with the municipalities of Berriozabal, Ocozocoautla and Cintalapa and to the west with the State of Veracruz (INEGI, 2005). A lot of 30 kg of cacaté seed was used, visually selected those that did not show apparent physical damage (Sant'Anna *et al.*,

2003). The seeds were kept in black polyethylene bags, stored in refrigeration at 4°C until they were used (Ahmadi *et al.*, 2013; Mohammad *et al.*, 2015).

#### *Grinding raw material*

The cooled cacaté seeds were previously left at room temperature for 6 hours and then peeled manually, removing the testa and keeping the endosperm. The endosperms that corresponded to the fraction of interest, were ground in disk mills (Industrial Engineering) and later sieved in vibrating screen (Luheng Instrument Co.), obtaining a flour of varied granulometry. It was stored in amber bottles with a lid and kept refrigerated at 4°C until used (Guerra and Zúñiga, 2003; Belén-Camacho *et al.*, 2005).

#### *Bromatological composition*

The chemical characterization of the endosperm was evaluated by determining the bromatological composition moisture (AOAC 925.10), ash (AOAC 923.03), protein by the Kjeldahl method (AOAC 920.87), fat and oil by the Soxhlet method (AOAC 920.39), total fiber by acid and alkaline digestion (AOAC 985.29) and carbohydrates by weight difference (AOAC, 1990). All analyzes were performed in triplicate.

#### *Aqueous-enzymatic extraction of oil*

The aqueous-enzymatic extraction of the cacaté seed was done with 15g of the ground endosperm (Grasso *et al.*, 2006) which was weighed in a 250 mL Erlenmeyer flask, the moisture content was adjusted to a solid:liquid ratio (w/v) 1:5 (Guerra and Zúñiga, 2003; Latif and Anwar, 2008). Subsequently, the enzyme preparation was added to an enzyme concentration: substrate according to Chart 1 (Guerra and Zúñiga, 2003), immediately after the sample was incubated for hydrolysis in a water bath with Felisa brand heating at 50°C for the period established for each treatment (chart 1) as reported by Li *et al.*, (2011). After the hydrolysis time, the sample contained in the flask was subjected to a boiling water bath for 5 min (Latif and Anwar, 2011), followed by a cold bath for 5 min to inactivate the enzyme.

The hydrolyzed sample was transferred to 50 mL Falcon tubes, centrifuged at 4,000 rpm for 20 min at 4°C (Latif and Anwar, 2008) in an Eppendorf brand centrifuge. The oil fraction (OilI) was recovered by decanting the centrifuged sample, storing at 8°C, in an amber flask. The aqueous phase was subjected to three washes with 15 mL of hexane, in order to recover the oil dispersed in the water, then the hexane was evaporated and the

fraction of oil (Oil<sub>III</sub>) recovered was weighed and stored at 8°C in an amber bottle. All enzymatic hydrolysis treatments were carried out in triplicate, the control treatment was subjected to the same conditions except for the addition of enzyme, and the efficiency of the aqueous-enzymatic extraction process was compared with the extraction performance of the oil by solvent which was the control treatment, following the methodology described by the AOAC (1990).

#### *Commercial enzyme preparations*

The enzymatic preparations used in this study to improve the extraction efficiency of the cacaté oil were Crystalzyme Cran (CC) with cellulase, hemicellulase and pectinase activity of *Aspergillus niger* with optimum temperature of 40 to 60°C of the Valley Research laboratory and the preparation Cellulase 17600 (C17600) with cellulase activity of *Aspergillus niger*, optimum temperature of 40 to 60°C, both are considered GRAS enzymatic preparations (Generally Recognized As Safe) by the FDA (Food and Drug Administration) (Spök, 2006).

#### *L8 Taguchi Experimental design*

The effects of the variables type of enzyme, enzyme concentration, time, and particle size; were evaluated using an L8 Taguchi statistical design. The experimental work developed considers four factors: one qualitative (type of enzyme) and three quantitative factors (enzyme concentration, time and particle size) evaluating each independent variable in two levels (chart 1). The extraction yield, calculated by the following formula, was evaluated as a response variable.

$$\text{Performance (\%)} = \frac{\text{Oil}_I + \text{Oil}_{II}}{\text{Oil}_T} \times 100 \quad (1)$$

Where:

Oil<sub>I</sub> is the oil phase recovered after centrifugation,  
Oil<sub>II</sub> is the oil recovered in the aqueous phase after washing with hexane,  
Oil<sub>T</sub> is the oil extracted with commercial hexane by extraction with Soxhlet.

Statistically significant treatments were evaluated using the analysis of variance (simple ANOVA) with a confidence level of 95% (Montgomery, 2001). The treatments that showed significant difference were analyzed through the Tukey test at 5% for the comparison of means (Latif and Anwar, 2008). The

data obtained were analyzed using the statistical software STATGRAPHICS Plus version 5.1. The treatment that generated optimal yields was used to establish the experimental design in the optimization.

**Chart 1.** Taguchi experimental design

Treatment	Commercial enzymatic preparation	Concentration of the enzyme preparation (%)	Particle size (mm)	Time (h)
1	CC	0.5	1.19	4
2	CC	0.5	2.38	8
3	CC	1.0	1.19	8
4	CC	1.0	2.38	4
5	CC-C17600	0.5	1.19	8
6	CC-C17600	0.5	2.38	4
7	CC-C17600	1.0	1.19	4
8	CC-C17600	1.0	2.38	8

*Optimization of the operation variables*

The variables that influenced the extraction performance of oil in the L8 Taguchi experimental design were subsequently optimized by the Response Surface Methodology (MSR), using a Box-Benhken experimental design (chart 2). The variables considered were agitation speed, enzyme concentration and particle size, evaluating each variable in three levels. The natural and coded levels of the independent variables used in the experimental design are shown in Chart 3.

**Chart 2.** Box-Benhken experimental design

Treatment	Agitation speed (rpm)	Enzyme concentration (%)	Particle size (mm)
1	0	0	0
2	-1	-1	0
3	1	-1	0
4	-1	1	0
5	1	1	0
6	-1	0	-1
7	1	0	-1
8	0	0	0
9	-1	0	1
10	1	0	1
11	0	-1	-1

12	0	1	-1
13	0	-1	1
14	0	1	1
15	0	0	0

**Chart 3.** Levels of the Box-Behnken design independent variables

Independent variable	Levels		
	-1	0	1
Particle size <sup>a</sup> (mm)	0.595	0.8	1.19
Agitation speed <sup>b</sup> (rpm)	60	80	100
Enzyme concentration <sup>c</sup> (% v/v)	0.5	1.0	1.5

a = Guerra y Zúñiga (2003), b = Grasso *et al.* (2006), c = Latif y Anwar (2008)

The methodology of the response surface allowed determining the optimum combination of particle size, agitation speed, enzyme concentration that maximizes the extraction performance of the oil. The total treatment was 15 with three repetitions. The statistically significant effects were evaluated using the analysis of variance (ANOVA) at a level of 95% confidence ( $P < 0.05$ ) (Montgomery, 2001; Latif and Anwar, 2008). The data obtained were analyzed using the statistical software STATGRAPHICS Plus version 5.1.

## RESULTS AND DISCUSSION

### *General characteristics*

The yields of the fractions that make up the *Oecopetalum mexicanum* seed are shown in chart 4. It should be noted that the major fraction corresponds to the endosperm that represented 54.91% of the total weight of the seed, and it is the fraction of interest as oleaginous matter.

**Chart 4.** Cacaté seeds fractions performance

Fraction	Proportion (% w/w)
Full seed	100
Endosperm	54.91
Exocarp	45.09

### *Bromatological composition of the cacaté seed*

The endosperm of the cacaté seed is characterized by a moisture content of  $64.79 \pm 0.20\%$ , this value is relatively high compared to that reported by Cruz (2004) of seeds collected in the municipality of Ocozocoautla (47.26%) and by Ballinas *et al.* (2009) (52.6%) for seeds collected in the municipality of Tapilula. The difference in moisture content may be due to the geographic location of the crops, the harvest season, weather conditions, among other factors (Belén *et al.*, 2001).

It is observed in chart 5 that the cacaté seed used in this study stood out for its attractive content in fat, protein and fiber, with 39.25, 12.59 and 4.25% respectively; these results are consistent with those obtained by Ballinas *et al.* (2009) for cacaté seeds collected in the municipality of Tapilula, Chiapas reporting a fat content of 35%, protein 13.24% and fiber of 4.15%. Centurion *et al.* (2000) reported fat content of 30.7% and protein of 8.0% of a cacaté seed harvested in the municipality of Tlacotalpa, Tabasco. The variation observed in the fat content can be attributed to the extraction conditions of the oil (Solís-Fuentes *et al.*, 2001), in addition the composition of the seed is influenced by the maturity of the fruit (Belén *et al.*, 2001), the geographic location of the collection area, the harvest season and climatic changes (Belén *et al.*, 2001; Matos and Acuña, 2010).

**Chart 5.** Bromatological composition of the cacaté seed

Compound	Content (g/100 g)
Ash	2.30±0.13
Fat	39.25±0.33
Protein	12.59±0.10
Raw fiber	4.25±0.16
Carbs	41.61±0.16

Fuente: Data reported on dry basis

Note: The results presented correspond to the mean  $\pm$  SD (n=3)

The protein content of the cacaté is comparable with that of the amaranth (15%) and higher than the average reported for wheat (10.6%), corn (11%) and rice (7.4%) (Belén *et al.*, 2001) The fiber content found for the cacaté seed (4.25%) is similar to the one reported for the sunflower (3.7%) (Badr and Sitohy, 1992) and *Moringa oleifera* (4.2%) (Compaoré *et al.*, 2011), but lower to the reported for sesame (11.2%) and canola (7%) (Belén-Camacho *et al.*, 2005), although the applied method does not reveal the nature of the

fibers of the cacaté seed, the presence of dietary fiber is important given the relationship with the prevention and control of cardiovascular diseases, diabetes and intestinal cancer (Belén *et al.*, 2001). On the other hand, the fat content was higher than the average of cereals (5%) (Belén *et al.*, 2001) When compared to conventional oilseeds, it exceeds sesame (30%), cotton (22%) and soybeans (18%) (Belén-Camacho *et al.*, 2005) and is lower than the one reported for canola (43%), *Moringa oleifera* (43.5%) (Compaoré *et al.*, 2011), and sunflower (45%) (Badr and Sitohy, 1992), because of its attractive oil content, the cacaté seed could be considered an important unconventional source for harvesting of oil.

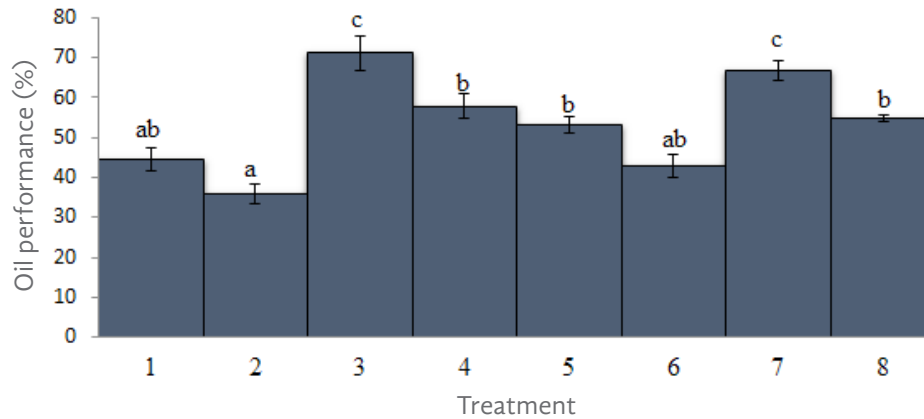
The protein and fiber content found in the cacaté seed makes it possible to derive that the byproduct resulting from the extraction of the oil could be used in the formulation of foods destined for human consumption or animal consumption, considering the beneficial effects for health that lead to the consume these compounds.

*Enzymatic aqueous extraction of the oil using the  
Taguchi experimental design ( $L_8$ )*

Image 1 shows the oil yields obtained in each treatment of the Taguchi experimental design. The yield of extracted oil varied from 35.9 to 71.1% according to the conditions of the enzymatic treatment, these values were higher than that obtained with the control treatment using hexane, which was  $34.25 \pm 2.00\%$ . The maximum yield of extracted oil was obtained in the treatments T3 and T7, made with the enzymatic preparation Crystalzyme Cran ( $71.06 \pm 4.37\%$ ) and the combination of Crystalzyme Cran-Cellulase 17600 (ratio 1:1) ( $66.68 \pm 2.49\%$ ) respectively; statistically there was no significant difference ( $p < 0.05$ ) between these two treatments. Based on these results, the enzymatic preparation Crystalzyme Cran was selected, with enzymatic activity cellulase, hemicellulase and pectinase which, due to its hydrolytic action, acts by breaking or destabilizing the structure of the cell wall of the cotyledon, promoting the solubilization of different components, mainly polysaccharides (Soto *et al.*, 2008) making it more permeable (Silvamany and Jahim, 2015), which improves oil extraction yields. The saccharification of the cell wall polysaccharides is carried out with a mixture of cellulase enzymes and pectinases, also containing hemicellulolytic activity, the enzymes increase the surface area of contact with the solid particles increasing the extraction of the oleosome (Kapchie *et al.*, 2010)

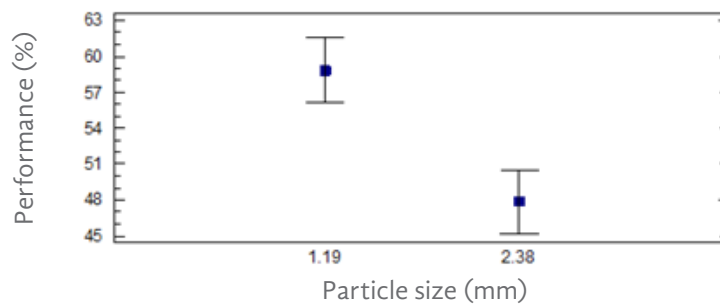
**Image 1.** Cacaté oil extraction performance, according to the Taguchi experimental design



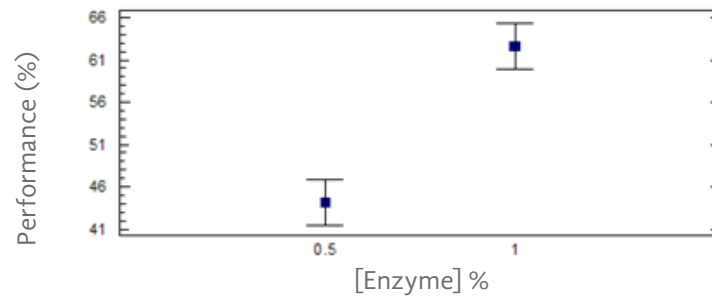


The variables particle size (Image 2) and enzyme concentration (Image 3) presented a statistically significant difference ( $p < 0.05$ ) on the response variable. An increase in particle size from 1.19 mm to 2.38 mm a significant decrease in the yield of extracted oil is observed, very close values of particle size of 1.5 mm in diameter was reported as adequate but not optimal for oil extraction (Matos and Acuña 2010). When increasing the concentration of enzyme (1% v / v), the yield of extracted oil increased reaching up to 65% (Image 3), this is attributed to the fact that at higher concentrations of enzymes, more active sites are available to interact with substrates, resulting in an increase in oil yield (Li *et al.*, 2011).

**Image 2.** Means and 95.0 percentages LSD intervals for particle size

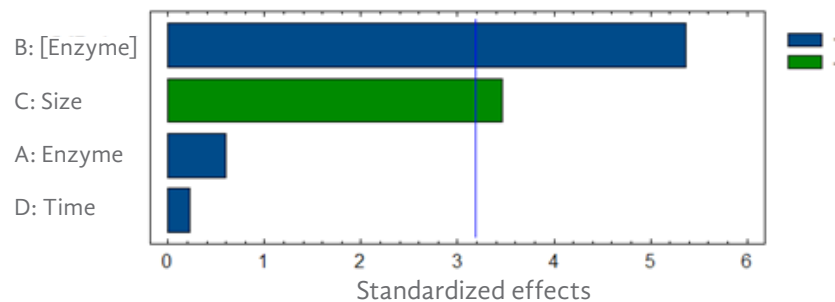


**Image 3.** Means and 95.0 percentages LSD intervals for enzyme concentration



The Taguchi experimental design allowed evaluating the effect of the enzyme concentration, particle size, incubation time and type of enzyme on the extracted oil yield. In Image 4 it is observed by the Pareto graph that the factors concentration of enzyme ( $P=0.0127$ ) and particle size ( $P=0.0451$ ) showed significant effect on oil extraction performance. The enzyme concentration induces a positive effect, while the particle size induces a negative effect (Image 4). The above is confirmed by the results of analysis of variance presented in chart 6.

**Image 4.** Standardized Pareto graphic for performance (means)



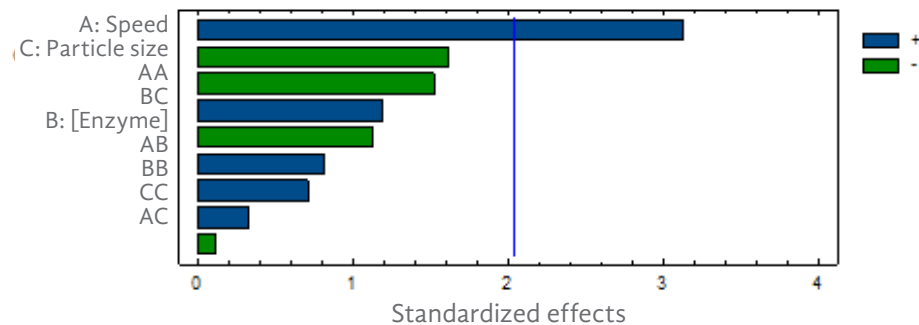
**Chart 6.** Variance analysis for the performance of cacat  oil

Source	Sum of Squares	GI	Mean Square	F-Ratio	P-Value
A:Enzyme	1.35963	1	1.35963	0.36	0.5920
B:[Enzyme]	109.516	1	109.516	28.81	0.0127
C:Size	38.4708	1	38.4708	10.12	0.0451
D:Time	0.18635	1	0.18635	0.05	0.8390
Total error	11.405	3	3.80166		
Total (corr.)	160.938	7			

### Optimization of the operation variables

The design of Box-Behnken to find the optimal conditions of enzyme concentration, particle size and stirring speed that maximizes oil extraction performance is presented in Chart 2. The Pareto graphic (Image 5) shows that only the Stirring speed had a significant effect on the oil extraction performance, which is verified with the results of the analysis of variance (chart 7) that showed significant statistical difference ( $p < 0.05$ ) with a value of  $P=0.0037$ . The particle size, enzyme concentration and all interactions had no significant effect on the yield of extracted oil (Image 5 and Chart 7).

**Image 5.** Pareto graph for oil extraction performance



**Chart 7.** Variance analysis for oil performance

Source	Sum of Squares	Gl	Mean Square	F-Ratio	P-Value
A:Speed	8122.96	1	8122.96	9.76	0.0037
B:[Enzyme]	1047.67	1	1047.67	1.26	0.2700
C:Particle size	2180.49	1	2180.49	2.62	0.1150
AA	1931.26	1	1931.26	2.32	0.1372
AB	543.706	1	543.706	0.65	0.4247
AC	10.0631	1	10.0631	0.01	0.9131
BB	425.489	1	425.489	0.51	0.4796
BC	1190.0	1	1190.0	1.43	0.2403
CC	88.2608	1	88.2608	0.11	0.7467
Blocks	54.3765	2	27.1882	0.33	0.9679
Total error	27462.4	33	832.193		
Total (corr.)	43246.4	44			

According to the mathematical model, the maximum predicted yield of extracted oil was 150.82% with an  $R^2$  of 89.73%, under the optimum conditions of

agitation speed 80 rpm, enzyme concentration 0.5% and particle size 0.595 mm. The validation of the model was performed by repeating the experiment in triplicate under optimal conditions, obtaining an experimental oil extraction yield of 151.54%, this is a prediction error of 0.0048%; which indicates a satisfactory adjustment of the equation with the experimental data and suggests that the optimized model was adequate and effective.

The percentage of the oil performance was adjusted with the model:

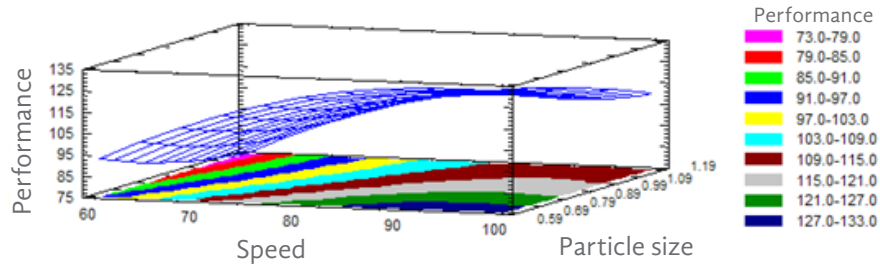
$$\begin{aligned} \text{Performance (\%)} = & 22.4836 + 5.66577A - 176.395B - 143.603C \\ & - 0.0330104A^2 + 0.673118A \cdot B - 0.153907A \cdot C + 24.791B^2 + \\ & 66.9462B \cdot C + 31.8934C^2 \quad (2) \end{aligned}$$

Where, A is the agitation speed (rpm), B is the enzyme concentration (%) and C is the particle size (mm).

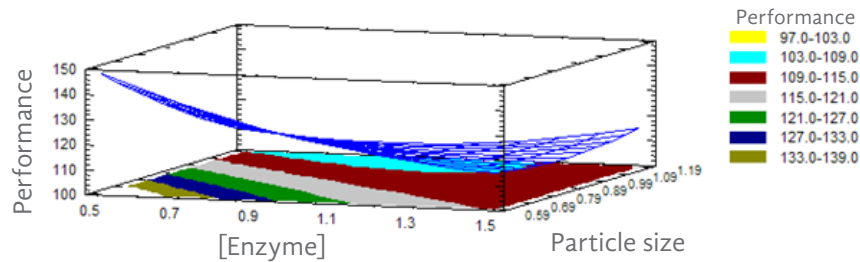
The equation of the Box-Behnken model (Ec.2) is represented graphically in Images 6 and 7. Considering the constant concentration of enzyme (Image 6), the response surface graph shows that at low values of agitation the yields of extraction are low, this because adequate diffusion of the enzyme on its substrate is not allowed; however, as the stirring speed increases, the oil yield is higher until reaching a speed in which there is a decrease in the performance which is attributed to the fact that the greater the agitation, the emulsion formation is allowed or favored preventing the enzyme-substrate contact (Sharma *et al.*, 2002). It is observed (Image 6) a maximum oil extraction performance of 127 to 133% using agitation speed in the middle range and smaller particle size. These results agree with what was reported by (Ahmadi *et al.*, 2013) who observed an increase in oil recovery by increasing the mixing speed from 40 to 80 rpm while the recovery was reduced by increasing the agitation by more than 80 rpm. The performance achieved can be attributed.

Considering the stirring speed (Image 7) it is observed in the response surface graph that at the lowest enzyme concentration and the smallest particle size, the oil extraction yield was maximized up to 133 to 139%.

**Image 6.** Response surface estimated for [Enzyme] = 1.0%



**Image 7.** Response surface estimated for speed = 80 rpm



## CONCLUSION

The cacat  seed is a recommended raw material for the extraction of oil, as a product of interest, in addition for its protein content the flour could be used in the formulation of food intended for human or animal.

The enzymatic treatment of the cacat  fruits endosperm (*Oecopetalum mexicanum*) was an efficient method to improve the extraction yields of the oil.

The process of standardization of the operating conditions allowed establishing the parameters that influence the extraction performance, being these temperature, particle size, solid: liquid ratio and type of enzyme. On the other hand, the Box-Benhken experimental design showed optimal conditions: agitation speed=89 rpm, enzyme concentration = 0.5% and particle size 0.595 mm with an optimum oil performance of 150.

The model has an error of prediction of oil extraction performance of 0.0048%, indicating that the model predicts in a 99.52% the response variable.

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PRELIMINARY RISK ANALYSIS OF  
CLIMATE CHANGE IN THE COAST  
OF TAPACHULA MUNICIPALITY,  
CHIAPAS, MEXICO

—

Vicente Castro Castro  
vicente.castro@unach.mx

FACULTY OF AGRICULTURAL SCIENCES, UNIVERSIDAD  
AUTÓNOMA DE CHIAPAS, MÉXICO



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— Abstract —

Climate changes that are currently being experimented have started to be of the highest concern and worldwide attention. The effects of climate changes are, among others, the increase of the sea level, the frequency and intensity of hurricanes and extreme wave events, this last effect would mean for the cities that are located on the coast to be in a high vulnerability condition. Chiapas has been identified as one of the most affected states due to the increase of the sea level. In this work, a preliminary analysis of the coast hazard level of the beaches of Tapachula is carried out, analysis based on the future estimates of the increase of the environmental temperature and the increase of the sea level as well as of the extreme events. For the analysis, “The Coastal Hazard Wheel” method was applied and a documental analysis of the extreme events and the damages that were produced in the last five years was also carried out. It was found critical, that one of the two analyzed areas is located in a high level of hazard, in the present time as well as in the future, it means that it is time to take some actions, knowledge-based, that would allow to protect the community patrimony and heritage, but most importantly the personal security as well as the tourists that visit the beaches on the area. It is urgent to examine and take into account the studies done these days as well as to generate new information for the effects of planning and management of the beaches of Tapachula, Chiapas, by means of an integrated management approach to the coastal zone.

### Keywords

*Coastal hazard analysis, coastal erosion, global warming, integrated coastal zone management.*

The climate changes that are currently experienced worldwide are already of the highest concern and attention everywhere. In this context, global warming looms as one of the greatest future threats for the world population as it is expected, among other changes, an increase in the levels of droughts, increase in the frequency and intensity of storms and hurricanes, an increase in the average sea level, as well as an increase in extreme events such as the sea bottom.

The increase in the environmental temperature is a reality that is analyzed at national and state level. In Mexico, mainly for the northern states, it is estimated that the increase in temperature between 2020 and 2080 can be between 2 to 4°C, while the increase in the surface temperature of the Caribbean Sea, Gulf of Mexico and Pacific Ocean is estimated in the order of between 1 and 1.5°C (National Institute of Ecology [INE], 2006). For the State of Chiapas, the scenarios of expected increase in the environmental temperature can be observed in Table 1.

**Table 1.** Environmental temperature scenarios for the state of Chiapas

	2020	2050	2080
<b>Temperature SRES A1B</b>	+1.0 a +1.1 °C	+1.6 a +1.8 °C	+2.2 a 2.6 °C
<b>2075-2099</b>			
<b>Japanese model temperature</b>	Mean temperature		Maximum temperature
	+2.4 a +3.4		+2.4 a +3.6

Source: Table prepared with information of the project "Climate scenarios for the state of Chiapas. Final report phase II (UNICACH, 2010)

Given the rise in environmental temperature, one of the main expected effects is the increase in the mean sea level (Grinsted *et al.*, 2009), an effect mainly explained by thermal expansion and ice melting (Meehl *et al.*, 2007). According to Vázquez-Botello (2008) the most affected states in Mexico, before the increase of one meter in the sea level, will be Campeche, Chiapas, Nayarit, Oaxaca, Quintana Roo, Sinaloa, Tabasco, Tamaulipas, Veracruz and Yucatan (Image 1).

The increase in the mean sea level will result in an increase in the depth of the water column, which will lead to a decrease in the friction of the bottom and increase the energy of the waves (Vázquez-Botello, 2008). This will lead to more intense processes of beach erosion and, consequently, damage to the coastal infrastructure as well as private properties and risks for bathers, which will also intensify in the face of events such as hurricanes and deep sea.

**Image 1.** Affected areas of Mexico. In red, the areas that will be affected by the 1 m increase in the mean sea level for Mexico are shown.

The white circle shows the coast of Chiapas



Source: Environmental Research Laboratory, University of Arizona

Given the future scenario and its potential effects, it is urgent to assess the risk levels of the coast in those entities where greater damages are expected such as the coast of Chiapas. In this sense, a preliminary coastal risk analysis was carried out in the municipality of Tapachula, the result of this analysis was subject to ratification or rejection based on the changes and/or damages documented in the coast of Tapachula, Chiapas in recent years. The analysis should be a tool that allows to contribute and promote an integrated management program of the coastal zone (MIZC) of the municipality of Tapachula in particular, and the state of Chiapas in general, to safeguard the coastal infrastructure, but even more, in the protection of the inhabitants of the coast and the visitors of the beaches.

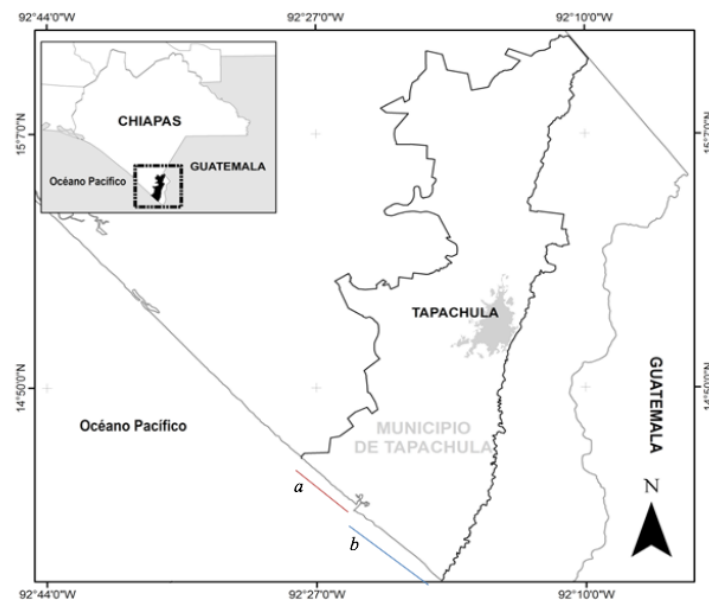
## METHODS

### *The coast of Tapachula*

The municipality of Tapachula is located in the southern portion of the state of Chiapas (Image 2) and has a coastline extension of around 21 km, of which just over 3.1 km correspond to the urban area of the Puerto Madero community, which is protected from the sea by an artificial stone wall and concrete blocks (Castro-Castro and Barrios-Ramos, 2009).

The coast of Tapachula belongs to the great marine ecosystem of the Central American coast of the Pacific, which is an open ecosystem with an oceanic limit established by the continental shelf (Escofet, 2009). Its origin is a collision of plates (De la Lanza, Ortíz-Pérez and Carbajal-Pérez, 2012). According to Ortiz and de Lanza Espino (2006) the area of interest is located in the southern region of the Mexican Pacific which is characterized by extensive sandy beaches, mostly of coarse and medium texture, with slopes commonly greater than  $12^\circ$  and they present distant waves of high energy coming from the south. The coast of Chiapas belongs to the coastal unit IX, with a coastal plain in development of moderate amplitude and with a wide continental shelf (Carranza-Edwards, Gutiérrez and Rodríguez, 1975). In the area of interest there are two climates, in the northwestern portion there is a warm sub-humid climate with rain in summer, with higher humidity, A (w2); while in the southeastern portion the climate is warm sub-humid with rain in summer, of medium humidity, A (w1); the dominant soils of the area are thick eutric regosol (Re/1) (INEGI, 2006).

**Image 2.** Work areas. The coastline of the municipality of Tapachula, Chiapas is shown. *a* = beach erosion zone, *b* = beach accretion zone



According to the Mexican Geological Service ([SGM], 2012) and Barrios-Ramos (2013) on the coast of Tapachula, there are two distinct areas, an area *a* of intense erosion that is located on the north-west of the breakwaters built in the 70's and that has affected homes and restaurants in the community of Puerto Madero, and an accretion zone *b* located southeast of the breakwater

mentioned above (Image 3). Based on this differentiation, the analysis was based on said zoning (Image 2).

**Image 3.** Breakwaters built in the 70's. The changes in the coastline are presented at both ends of the built breakwaters that separate the two study areas



Source: Barrios-Ramos (2013)

### *Preliminary Risk Analysis*

Based on the available scientific and climatological information, a preliminary analysis of the coastal risk level of Tapachula, Chiapas was conducted for the two indicated areas and applying "The Coastal Hazard Wheel (CHW)" (Rosendahl and Halsnæs, 2015) (Image 4), which is a simple technology tool that can be used in areas with limited data availability and institutional capacity, is, therefore, specially made for use in developing countries. The method first performs a classification of the coast, then identifies the level of inherent risk (low, moderate, high and very high) that is established under a climate change scenario in five biogeophysical properties of the coast (Rosendahl and Halsnæs, 2015):

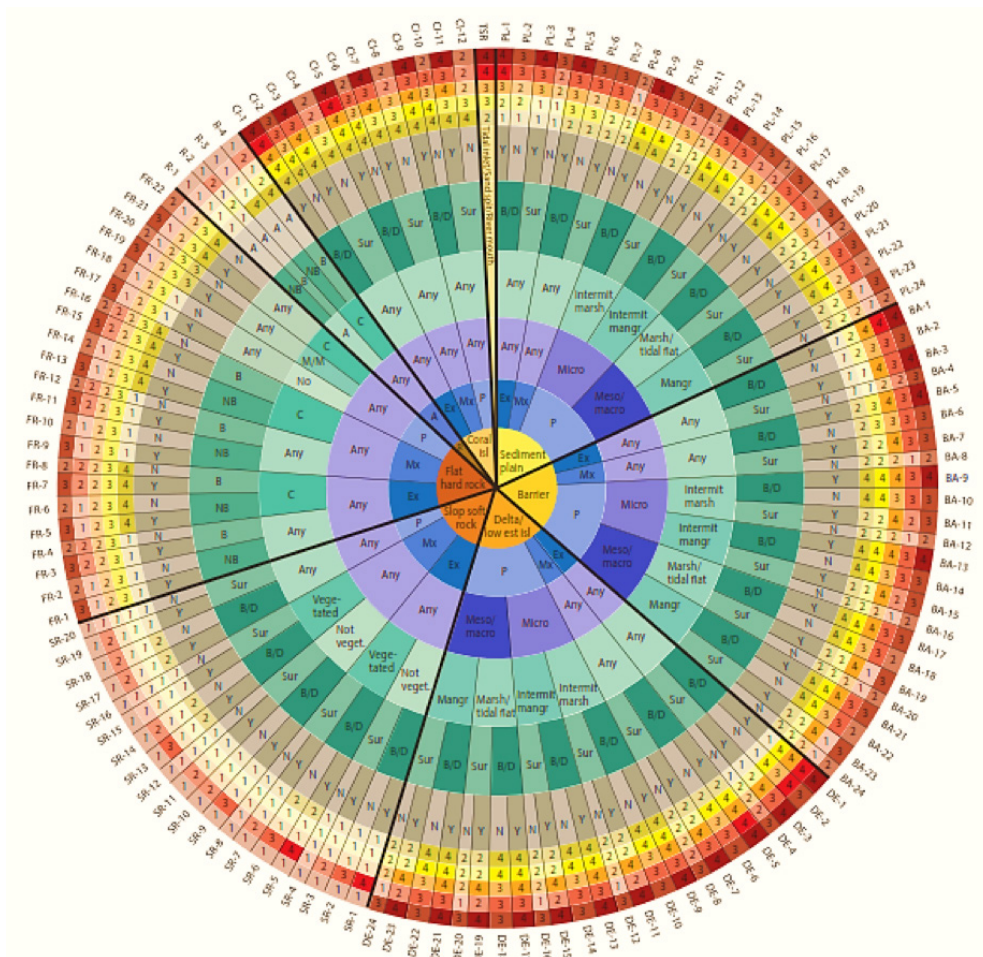
- a) Ecosystem disruption: describes the possibility of an interruption of the current state of the coastal ecosystem under a climate change.
- b) Gradual inundation: describes the possibility of a gradual submersion of a coastal environment under climate change.



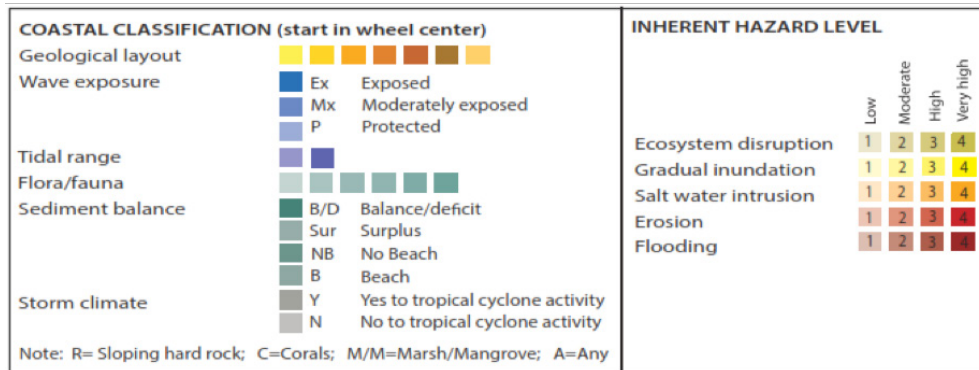
- c) Salt water intrusion: describes the possibility that marine salt water penetrates into shallow coastal waters and groundwater aquifers under climate change.
- d) Erosion: describes the possibility of erosion of a coastal environment under climate change.
- e) Flooding: describes the possibility of a sudden, abrupt and often dramatic flooding of a coastal environment caused by a short-term increase in water level due to storm surge and extreme tides under climate change.

The level of coastal risk obtained was validated from the changes and/or damages documented by various studies and by recent (2015) environmental phenomena (sea bottom) that modify and generate disasters in the coastline.

**Image 4.** Coastal risk wheel. Proposal used to assign the level of risk of the areas of interest (Rosendahl and Halsnæs, 2015)







## RESULTS

*From the available information*

When carrying out the search and analysis of the existing information it was possible to confirm that this is scarce; however, it was sufficient for the objectives of this work. Of the works carried out to date, the following stand out:

- a. Coastal dynamics study and wave measurement to solve the problem of clogging of the access channel of Puerto Madero, Chiapas (Mexican Institute of Transportation [IMT], 1997). Data on erosion and accretion were reported, on the protection structures, sediment transport, variations of the coastline, and beach profiles among others.
- b. Analysis of the erosion/accretion process in Puerto Chiapas, Mexico (Bustamante, 2007). This work made short and long term scenarios on coastal morphology, in addition to proposing solutions to erosion/sedimentation.
- c. Changes in the coastline of the municipality of Tapachula, Chiapas, Mexico (Barrios-Ramos, 2013). The study reports the short and long term changes that the Tapachula coastline has suffered, as well as documenting erosion, describing the beach profile, as well as the types of sand on different beaches.
- d. Atlas of hazards of the State of Chiapas. Technical report (SGM, 2012). This document describes the erosion/sedimentation processes that occur in the coastline; however, it does not establish any level of danger or risk.
- e. Loss of beaches in Puerto Madero, Chiapas. Damages and perspectives (Castro-Castro *et al.*, 2015). This work analyzes the loss of beaches, its consequences and the anthropic and natural factors that cause the erosion of the beaches of Tapachula, Chiapas.

- f. Erosion and sedimentation of beaches in the municipality of Tapachula, Chiapas, Mexico (Castro-Castro *et al.*, 2017). The study documents short and long term changes of the coastline of Tapachula, Chiapas; In addition, it describes, from the coastal sedimentation erosion index, the current state of the beaches, and performs a granulometric analysis of the same.

*Preliminary risk analysis; stage 1, classification of the coast*

Based on the existing information, the preliminary coastal risk analysis was carried out for the two well-defined zones of Image 2. Thus, the characterization of zone *a* was:

- \* Geological arrangement: sedimentary plain (■), coast with slope less than 3-4%, at least 200 meters inland from the middle tide line, are composed of sedimentary deposits of silt, clay, sand, gravel or large pebbles.
- \* Wave exposure: originally the area was totally exposed to the waves (■), to date about 50% of the area is exposed to waves (■) and 50% protected (■) by a barrier of stones and concrete blocks (Image 5a).
- \* Tidal range: micro-tidal (■) in normal climatic conditions (without storms, sea bottom or hurricanes), where the tidal range (vertical difference between high tide and low tide) is less than 2 meters.
- \* Flora/Fauna: it does not have a relevant role in the characteristics of the coast (■) and/or in the inherent risk profile, this because 50% of this area is protected by an artificial barrier of rocks and concrete blocks (Image 5a) and the remaining 50% presents mostly herbaceous vegetation (Image 5b) that very little contributes to the stabilization of the coast against the force of the waves.
- \* Sedimentary balance: although the sedimentary dynamics of this area, according to the methodology used, is located in the balanced/deficit category (■), the reality is that this area is totally deficient, since it is a highly eroded zone (Image 5c).
- \* Storm climate: the zone is of high tropical cyclonic activity (■).

**Image 5.** Evidence of the characteristics of the area *a*. Image shows the barrier of artificial protection of rocks and concrete blocks; image *b* shows herbaceous vegetation and image *c* the level of erosion



Zone *b* presented characteristics similar to zone *a* with the exception of the sedimentary balance, since in this zone the sedimentary dynamics was surplus according to the literature reviewed, so the beach has increased considerably.

*Preliminary risk analysis: stage 2, level of inherent risk*

The second stage of the methodology employed leads to determine the level of inherent risk defined as the risk that exists in the inherent part of the biogeophysical properties of a coastal environment, when exposed to predictions of changes in the global climate of the coming decades (Intergovernmental Panel Climate Changes [IPCC], 2007, 2013). Although the level of risk posed by the CHW method is under a future climate change scenario, it can also be applied to current conditions, so the exercise was carried out in the current and future scenario. The results of the current risk analysis of zone *a* and zone *b* are presented in Table 2.

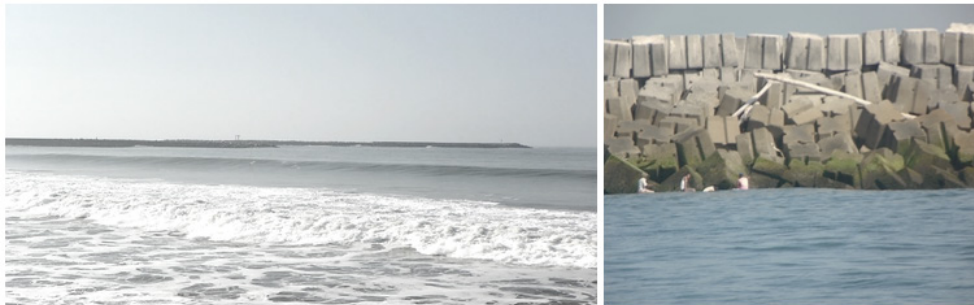
**Table 2.** Current coastal risk level of the sites analyzed

Biogeophysical properties	Intrinsic risk level							
	Low (1)		Moderate (2)		High (3)		Very High (4)	
	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>
Alteration of ecosystem		x						x
Gradual flooding				x	x			
Saline intrusion				x				x
Erosion		x						x
Sudden and catastrophic flooding				x	x			
Coastal risk level	Zone <i>a</i> , very high				Zone <i>b</i> , moderate			

The analysis carried out has taken into account the changes suffered in the coast of Tapachula in the last 10 years, and recent events of the sea bottom. Thus, the considerations made by biophysical property were:

Alteration of the ecosystem: the whole landscape of the beach, to the west of the breakwaters (zone *a*) built in the 70's, has been completely modified for the protection of the community of Puerto Madero with a stone barrier and concrete cubes (Images 5a, 6). This alteration has continued during the last years with the construction of new protection structures (Images 7), which undoubtedly is a very strong alteration of the beach ecosystem, which is why it was classified as very high risk.

**Image 6.** Breakwater and wall. It shows the breakwater built in the 70's (including extensions made in recent years) and the barrier of concrete cubes



**Image 7.** New works of "protection". The new "protection" works constructed in recent years in the west of the community of Puerto Madero, Tapachula, Chiapas, are shown in a circle



With regard to zone *b*, the alteration of the ecosystem has also occurred strongly, but due to intense accretion processes of the beach. The accretion processes have been considered, from the tourist perspective (AC National Academy of Research and Development [ANIDE], 2018), as a process that contributes to reducing the vulnerability of beaches, so that the level of risk for the zone *b* was established low.

Gradual flooding: for zone *a*, a high risk level was considered because the area is a storm climate and during the rainy and cyclones season; floods in

the community usually occur. For zone *b*, because it is a sparsely populated area (mainly resting houses), and with a wide beach, the risk level of gradual flooding was estimated to be moderate.

Saline intrusion: in conversations held with inhabitants of the Puerto Madero community, it was verified that salt water has been introduced around 60 to 100 meters into the continent, while in the low season the saline intrusion expands around 120 -150 meters to the continent, so this area was classified as very high risk. While for zone *b*, due to the amplitude of the beach, it was placed at moderate risk level.

Erosion: in terms of the erosion of the beaches analyzed, the evidence was overwhelming, zone *a* has suffered for more than 20 years severe erosion processes (Images 5c and 8), a process that continues today and has generated serious damage to tourism infrastructure and family heritage, so that the current level of risk was identified very high as can be seen in Image 8. For zone *b* the beach has had a progradation process, registering areas where the beach has grown little more than 800 meters (Image 9), which is why the area was at a low risk level.

**Image 8.** Erosion and damage in zone *a*. Severe erosion and damage to the touristic infrastructure and family heritage in Puerto Madero, Tapachula, Chiapas are shown. Images of September 2012



**Image 9.** Accretion of beaches. Part of zone *b* is shown. The black lines show the length of beach that has been acquired.  $a=830$  m,  $b=673$  m





Sudden and catastrophic flooding: this biophysical characteristic is perhaps the highest risk due to the sudden condition. In recent years there has been an increase in bottom-sea events, which have mostly been unexpected for the population of Puerto Madero and have caused major damage to the tourist infrastructure (Image 10). In the year 2015, three sea-bottom events were presented (April, May and August), the one happening in May being the most catastrophic one (Image 10), where according to the Meteorological Bulletin of the *Dirección General Adjunta de Protección y Seguridad Marítima de la Secretaría de Comunicaciones y Transportes*, the predicted waves reached heights greater than 2.1 m. To date, these sea-bottom events are occasional, so the level of risk assigned to this area was high. For zone *b*, given the width of the beach, the sea bottom has caused minimal damage, so the level of risk assigned was moderate.

There is no doubt about the existing evidence that zone *a* is an area of very high risk, since when estimating the average value, according to the CHW, it was 3.6, while for zone *b*, the average value was 1.6, which places this area with a moderate level of risk. The status of zone *a* with a very high level of coastal risk requires urgent attention from the authorities of the three levels of government, as well as from research institutions and society in general.

#### *Future scenario through CHW*

The CHW is a developed system of multi-risk assessment and multi-risk management of coastal areas under a scenario of climate change for decades

to come, and can be applied at a local, regional and national level (Rosendahl and Halsnæs, 2015). For the zones that are presented, it is important to mention that the analysis scenario was projected towards the closest temperature increase (Table 1) (2020; + 1.0 °C to + 1.1 °C), and the scenario of the highest temperature increase (2075-2099; + 2.4 °C to + 3.6 °C). In all cases, several documents conclude that the consequences of this increase in the environmental temperature will be a greater number of hurricanes per year and of greater intensity; as well as an increase in the mean sea level. Consequently, the expected risk analysis is presented in Table 3.

**Image 10.** Groundswell. Impact by sea bottom in Puerto Madero, Tapachula, Chiapas in May 2015



» HASTA el momento no se tiene un recuento total de daños, pero el mar sigue generando olas bruscas y peligrosas en Puerto Madero y otras entidades del pacífico mexicano. (Fotografía: Marco Hernández)

The average risk level for the zone *a* went from 3.6 to 3.8, while for zone *b* the change was from 1.6 to 2.2, although both zones increased their average risk value, the level of assigned risk remained in very high level of risk for zone *a* and moderate level of risk for zone *b*. The very high level of coastal risk in the zone *a*, current and future requires immediate attention.

**Table 3.** Expected risk level

	Intrinsic risk level							
	Low (1)		Moderate (2)		High (3)		Very high (4)	
	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>
Biogeophysical properties	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>

Alteration of ecosystem						x	x	
Gradual flooding				x	x			
Saline intrusion						x	x	
Erosion		x					x	
Sudden and catastrophic flooding				x			x	
Coastal risk level	Zone a , very high				Zone b, moderate			

## DISCUSSION

### *About the sea level rise*

For the Mexican Pacific coasts (excluding Acapulco, Guerrero) of which there is a registry (Ensenada, BC.; La Paz, BCS.; San Carlos, BCS.; Guaymas, Son.; Topolobampo, Sin.; Mazatlan, Sin.; Manzanillo, Col.; Puerto Angel, Oax.; and Salina Cruz, Oax.), trends have marked increases between 1.04 and 16.08 mm/year for the time period from 1951-1968 to 1987-1992. In the case of Puerto Madero, a rough approximation made by Castro-Castro *et al.* (2015) states that the sea level rise per year is 1.70 mm/year, a value very similar to those reported in Puerto Angel and Salina Cruz, Oaxaca of 1.70 and 1.13 respectively (Vázquez-Botello, 2008).

In the future there are several estimates regarding the sea level rise at a global perspective. The IPCC (2007) and Rahmstorf (2007) estimated that by 2100 (relative to 1990) the mean sea level will rise between 18 cm to 1.4 m. For the Gulf of Tehuantepec, including the coast of Chiapas, the approximations of the mean sea level rise, for the period 2010-2040, are between 1.8 to 2.0 mm / year, and for the period 2040-2070 are between 2.0 to 2.4 mm / year (United Nations [UN], 2015), which implies that from 2010 to 2070 the average sea level could rise between 114 mm to 132 mm. It is important to consider that numerical models give us estimates based on available data, which in many cases are insufficient, and expected data where uncertainty is high, so that approximations of increase must always be considered with due precautions and considering the uncertainty associated (Table 4). It is also advisable, for the protection of people, the coastal infrastructure, the assets of individuals and companies, to always consider the most dangerous scenario so the protection measures implemented are as efficient as possible, to ensure the greater security of society as a whole.

**Table 4.** Sea level expected rise and associated uncertainty (95% confidence) for the Gulf of Tehuantepec



	2040	2070
Expected average value (mm)	43.5 a 54.4	96.5 a 119.4
Associated uncertainty (mm)	2.2 a 3.5	7.1 a 8.2

Source: Chart made with UN data (2015)

With the rise in mean sea level it is expected that floods, storm surges, coastal erosion, salinization of the water table aggravate, this last one will decrease the availability of water for humans and the ecosystems of coastal areas. The rise in sea level will increase the water column, decreasing bottom friction, inducing higher energy waves in the coastline (Vázquez-Botello, 2008), and therefore, coastal erosion and potential damage to the coastal infrastructure and heritage of the people, in addition to the increased risk in the lives of people.

#### *About the coastal risk level*

Although the coastal risk level used here is based on the risk that exists in the biogeophysical properties of a coastal environment, when it is exposed to predictions of changes in the global climate of the coming decades, it is clear that its implications go beyond the biogeophysical characteristics, and necessarily involve socioeconomic (Puerto Chiapas, port area bordering the community of Puerto Madero, has been declared as Special Economic Zone, which enhances the risk analysis from an economic perspective), environmental and disaster aspects, such as watershed management, beach dynamics, changes in land use, protected natural areas, urban and rural development, salinization of the water table (decrease in the availability of water for human use and consumption), analysis and prevention of risks among many others.

In the case of zone *a*, the result was overwhelming both in current and future time, a very high coastal risk level. This level of risk was assigned since it was clearly and strongly evidenced that the original biophysical conditions of the zone *a* coast have been strongly altered and above all the processes of beach erosion have been and still are intense (Images 5c and 8), besides alteration of the ecosystem of beaches and the saline intrusion. It should also be noted that in recent years, extreme events such as the sea bottom have been presented with greater frequency and intensity (Image 10).

It is indisputable that the very high coastal risk level assigned to zone *a* leads to another concept that is duly relevant to the scenario posed in this area: the concept of Vulnerability. According to the IPCC (2001)

vulnerability is the "*Measure in which a system is capable or unable to cope with the negative effects of climate change, including climate variability and extreme events. Vulnerability depends on the character, magnitude and rate of climatic variation to which a system is exposed, its sensitivity and its ability to adapt.*" Vulnerability refers to three key components: a) exposure, which refers to the degree to which a system is exposed to external stimuli acting on it; b) sensitivity, refers to the rapidity of reaction, that is, to the degree of affectation and change (positive or negative) of the system in the face of climate change or any of its components, and c) adaptability, referred to the capacity or ability of a system to adjust to changes, in the sense of being better prepared to face and manage their "exposure" and "sensitivity" (Department of the Environment, Junta de Andalucía [CMAJA], 2011). When working with exposure + sensitivity, gross vulnerability is described, and when working with the three components, net vulnerability is described (CMAJA, 2011).

Under the previously described vulnerability approach, it is clear that zone *a* is highly exposed to external events, and it is also highly affected, in a negative way, to these stimuli, so it is highly feasible to consider this area with a very high level of gross coastal vulnerability; however, it is important to perform the analysis with the necessary details. It is also very likely that the net coastal vulnerability will be very high, since the evidence of damage and changes in the coastline does not allow us to consider that the area has a good capacity to adapt or adjust to changes.

Additionally, it is important to consider the occupation and urbanization of the coastal areas in an unplanned manner in these risk and vulnerability analyzes, since they generally do not respect the existing norms and laws regarding the use of land, modification and/or destruction of the coastal natural protections, such as mangrove forests and coastal dunes among others, and that alter the dynamics of coastal biophysical processes that consequently increase the natural fragility of the territory where social activities take place and therefore potentiate the negative effects on the community and their assets (Monti and Escofet, 2008; Cabrera *et al.*, 2009), as is the case of the community of Puerto Madero (Image 11) where the anthropogenic and natural damage suffered has led to the realization of multiple works of "protection" (breakwaters), works that contributed to the erosion and loss of beaches, which unquestionably affected the ecological balance of beaches; as well as the loss of houses, *palapas* and restaurants. In this context, the integrated management of the coastal zone is the fundamental tool, where the reduction of risks and disasters, have been analyzed as elements and actions that allow to prevent and minimize threats and

vulnerabilities (mitigate) that allow to give notice and if necessary evacuate the population during the occurrence of a disaster (alert), it is also included in this context save, assist and defend the population and their goods (respond), to finally proceed to the correction of damages (reconstruction) (Ramírez- Chávez, 2010).

**Image 11.** Madero Port. The barrier of stones and concrete blocks that protect the community are shown in black. The circles show areas where the stone barrier has disappeared



In the case of zone *a*, given the very high level of coastal risk, the high level of vulnerability and the evidence of damage to the community and its assets (Images 8 and 10), it is urgent to start working under the vision of a MIZC that allows, as soon as possible, planning and ordering the coastline of the municipality of Tapachula (including zone *b*), with the objective of making a sustainable management of the coast, as well as preventing risks and minimizing damages for the benefit of society.

## CONCLUSION

It is clear that the coast of Tapachula has two very different areas. However, given the current and future scenario, it is zone *a* that has been identified in this work as a zone of very high level of coastal risk and vulnerability, which consequently has placed and places society and its goods in conditions of high danger, which requires urgent attention in a context of adaptive integrated management.

## PROPOSALS

As an indispensable and urgent policy, it is proposed to initiate efforts to develop an adaptive integrated management program for the coastal area of Tapachula and the entire coast of Chiapas, which involves the aspects discussed here of coastal risk and coastal vulnerability, which it also involves the prevention and mitigation of risks in the event of disasters, as well as the consequent reconstruction if necessary. It must also necessarily involve the management and conservation of biotic and abiotic natural resources.

Another suggestion that could and should be implemented, in those areas where it is not yet urbanized, is the zonation proposed by Barrios and Castro-Castro (2013) consisting of (Image 12):

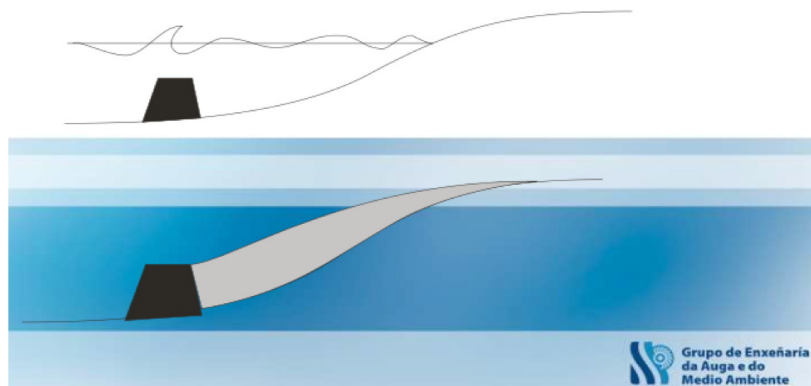
- a) Active zone: the intertidal zone, up to the waves of greater intensity reach limit, preferably registered in hurricane seasons;
- b) Buffer zone: area where the 20 m corresponding to the federal zone described in the General Law of National Assets must be applied. This area can be concessioned, but it is suggested that fixed infrastructure is not allowed, only movable accessories such as sun chairs and sunshades and therefore it is the ideal area for visitors to temporarily settle to enjoy the beach;
- c) Service area: an area with at least 20m in width and that must be an area also owned by the Mexican state and, if applicable, concessioned to individuals. In this area it is suggested to install non-fixed infrastructure (rustic *palapas*, portable stores, drinks and sweets kiosks among others); and
- d) security zone: zone from which it is already possible, with the corresponding environmental precautions (analysis of environmental risk and long-term analysis of the dynamics of the beach) the installation of fixed infrastructure (restaurants, houses, warehouses, among others), from this point, it is possible to have a greater guarantee in the security of the infrastructure, therefore a lower probability of economic loss.

**Image 12.** Zoning proposal Barrios and Castro-Castro (2013), propose four different zones for the beaches of Puerto Madero, Tapachula, Chiapas. Image taken from the aforementioned authors



Even when it is necessary to carry out the necessary studies, another proposal that must be considered are wave energy dissipaters such as artificial reefs, sunken ships or submerged stone structures and/or blocks of concrete that reduce the force of the waves that reach the beach (Image 13).

**Image 13.** Wave energy sink. It shows a submerged structure that allows to dissipate the strength of the waves



Source: presentation of the Universidad de Coruña and Enxeñaría de Auga e do Medio Ambiente in *Xornada on enerxía que vén do mar*.

It is also urgent to increase the scientific research that allows updating the existing information and generating the one that is essential for a program of integral management of the coastal zone. Investigation in sediment dynamics, currents, erosion and protection of beaches, accretion of beaches, environmental and socioeconomic impact, strategies of restoration and protection of natural resources, protection of coastal infrastructure among many other areas, information that allows decision-making based on knowledge, with the ability to adapt to the changes that arise, for the benefit of society in general present and future, that is, a program of coastal management intra and interdisciplinary, multi-sectorial, transversal and adaptive.

Citizen participation is essential, particularly for the inhabitants of Puerto Madero, who must be the main managers for the protection of their assets, but above all for the protection of themselves; besides being the first plaintiffs and protagonists of diverse actions like reforestation of the littoral zone, active participants in the decision making of future works of "protection" and "development" of the community, citizen training for management and decision making, demand of officials from the three levels of government with apt skills and competencies for coastal management.

Undoubtedly, this last characteristic is urgent and fundamental, since both the coastal municipalities and the state government do not have personnel to meet the needs of the Chiapas coast, even when they have clear faculties in the different legal systems; while the unit of coastal ecosystems of the Federal Delegation of SEMARNAT in Chiapas is too limited to cover the entire Chiapas coast. The aforementioned marks urgently that decision-makers in coastal management, mainly at the state and municipal levels, have the ideal profile, or at least be properly trained in coastal management, a skill that allows them to make the appropriate decisions that allow development and sustainable use of the coastal zone of Tapachula and Chiapas.

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AUTONOMY AND SUBNATIONAL  
FINANCIAL DEPENDENCE.  
EVIDENCE FOR A LOCAL  
DEVELOPMENT POLICY IN MEXICO

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Paul Eduardo Jiménez López  
lalo\_870624@hotmail.com

UNIVERSIDAD AUTÓNOMA DE CHIAPAS, MÉXICO.



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— *Abstract* —

The purpose of this article is to analyze the relationship and impact autonomy and financial dependence has had on Gross Domestic Product (GDP) per head of subnational government in Mexico. Economic growth is not enough for the creation of local developmental processes. However, it is a necessary condition that may encharge actors of local politics to consider detonating real developmental processes and improve living conditions of society. The research propose two indicators of autonomy and subnational financial dependency. In addition, econometric models were created using the methodology of data ordered in panel to analyze the impact about the product per person. In essence, it conclude that there is statistical evidence at an international level about the importance of financial autonomy in economic activity as well as mexican cases it observed in the same variables.

**Keywords**

*Financial autonomy; financial dependence; local development policy.*

**A**t the beginning of the 1980s, Mexico experienced important changes in several sectors of the national economy. In 1978, former President José López Portillo enacted the Fiscal Coordination Law in order to share tasks of revenue collection and distribution of spending between the federal government, state and municipal authorities (World Bank, 2006). The objective was to build a more cooperative federalism among the three levels of government and to address more efficiently the most important needs of society; however, the indicators of poverty and social wellbeing currently challenge the local development policy that has been implemented in the country. According to the National Council for the Evaluation of Social Development Policy (CONEVAL, 2013) in 2012, 61.2% of the population in Mexico did not have social security and approximately 45.5% of the population was in poverty.

There is evidence that shows that in Mexico a process of decentralization of public spending has been carried out maintaining a strong centralism of the main taxation powers, that is, subnational governments have limited themselves in the collection of resources and have become dependent on transfers from the federal government. Contrary to the logic of the Mexican model, the focus of local development focuses on the strengthening of local autonomy and the active participation of territorial actors in the design and implementation of development policies, in this sense, for Arocena (2002) it is important that decentralization reforms provide sufficient degrees of autonomy that allow local actors to efficiently manage their own resources; in other words, local autonomy is a fundamental condition of development and therefore a key element to improve the quality of life of the population.

For the local development approach, the efficient and timely intervention to the social demands in the territories requires a greater endowment of subnational financial autonomy. Financial autonomy is understood as the ability of subnational governments to have sufficient own resources and cover the needs of spending in their respective jurisdictions, in other words, financial autonomy means the existence of own resources on the one hand and the ability to make decisions on the use of those resources on the other. According to Cabrera and Lozano (2010), to speak of financial autonomy in subnational governments implies, in advance, to identify the taxes on those with regulatory capacity and the relative importance they have over total income, in this same sense Inza (2004) defines the concept of financial autonomy as follows:

Financial autonomy implies freedom of decision on the part of the local government regarding the destination of its resources and the structure of its

expenses, the possibility of deciding on the total volume of disposable income and distribution of the tax burden among the taxpayers and the power to arrange operations of Treasury, borrowing in the medium and long term in order to finance investments (page 23).

The purpose of this research is to analyze the relationship and impact of autonomy and financial dependence on GDP per capita in the states during the period 1997-2012. While it is true that development is a much broader concept, it is also true that economic growth is a necessary condition for development, therefore, for practical purposes of research, GDP per capita has been considered as a proxy variable that allows analyzing local development processes in subnational governments of Mexico.

The article is structured in three general sections, the first of which deals with the methodological aspects and the variables used in the development of indicators of autonomy and financial dependence. In the second section the results obtained in the econometric models are presented from the data and the indicators proposed in the research, finally, the conclusions generated are mentioned based on the theoretical and conceptual expositions.

## METHODOLOGY

The results and reflections of the research were generated from the development of a quantitative methodology that consisted basically of two stages. In the first stage, two proxies indicators of autonomy and subnational financial dependence were developed with data displayed by the National Institute of Statistics and Geography (INEGI, 2015). In the second stage, two econometric models were elaborated with data ordered in a panel, one of them analyzes the case of the subnational governments of the countries of the Organization for Economic Cooperation and Development (OECD, 2015) and the second model analyzes the indicators of autonomy and financial dependence as independent variables and the subnational GDP per capita as a dependent variable.

$$\text{Financial Autonomy Index} = (\text{own income} / \text{Total expenditure}) * 100$$

$$\text{Financial Dependency Index} = (\text{Transfers} / \text{Total Expense}) * 100$$

According to Gujarati and Porter (2010), econometrics makes an abstraction of reality through statistical methods that are combined with economic sciences and mathematics. Within econometrics itself there are different research methodologies such as cross-sectional models, co-integration

analysis in time series models and panel data models; for this research, the data grouped in panel methodology was used since it has the advantage of combining cross-section and time series models, therefore, they are models that help explain the behavior of the variables better; in addition, panel-type models have a great advantage over cross-sectional and time-series models since they work with a greater number of statistical data due to their two-dimensional character (time and space). As with conventional models, panel grouped models are usually expressed in linear regressions such as the following:

$$Y_{it} = \alpha_{it} + \beta X_{it} + U_{it}$$

Where Y is the endogenous or explained variable and X to Xn the exogenous or explanatory variables, that is, is the ith observation at t time for the K independent variables. In the same way the term (i) represents the transverse units, (t) time. ( $\alpha$ ) Intercept vector, ( $\beta$ ) vector of K parameters and finally (Uit) represents the error term in the model. There are three important specifications in the models grouped in panel, these can be fixed effects, random or dynamic models, the choice between one or another model will depend on the nature of the data that is available; however, the researcher can perform statistical tests that will allow them to choose the appropriate model (Hausman Test).

Table 1 describes each of the variables that were used in the model for the case of subnational governments members of the OECD. This organization is composed of thirty-four countries, however, seven countries were not considered in the model because they had partial or no information for the period of analysis, these countries were Australia, Chile, Turkey, Estonia, Iceland, Korea and Poland.

**Table 1.** Variables included in the model for OECD countries

Variables	Denotation	Measurement Unit	Period
GDP per capita.	Log (GDPpc)	Constant 2005 prices in US dollars.	2006 - 2010
Consolidated revenues of subnational governments.	Log (CR)	As GDP percentage	
Income of transfers from subnational governments.	Log (TR)	As GDP percentage	

Source: Own elaboration

For the OECD, the consolidated revenues of subnational governments are defined as total revenues minus transfer income. For the purposes of this research and given the existing information, the consolidated revenues were taken as a percentage of GDP as a proxy variable of the indicator of financial autonomy prepared for the states in Mexico, in the same way, transfers as a percentage of GDP represent a proxy of the index of financial dependence.

Table 2 contains the variables that were used to model the behavior of the indicators of autonomy and financial dependence that were previously constructed for the case of subnational governments in Mexico. Unlike the OECD model, each explanatory variable was run separately resulting in three different models. The reason for independently analyzing each indicator in relation to GDP per capita was basically due to two reasons, on the one hand to avoid problems of multicollinearity and autocorrelation but also because of the characteristics of the indicator of financial dependence since this can be divided into participations (branch 28) and contributions (branch 33).

**Table 2.** Variables included in the models used for the states

Variables	Denotation	Measurement Unit	Period
GDP per capita.	Log (PIBpc)	Constant 2008 prices in Mexican pesos	1997 - 2012
Index of financial dependence with respect to federal participations.	IDF28	From 0 to 100 %	
Index of financial dependence with respect to federal contribution.	IDF33	From 0 to 100 %	
Index of financial autonomy	IAF	From 0 to 100 %	

Source: Own elaboration

## RESULTS

In 1992, there was a considerable decrease in the financial autonomy indicator of subnational governments in Mexico, while the national average was 8.68% during the period from 1990 to 2012. These low levels are the result of the decentralization policies of public expenditure that occurred at the beginning of the 1990s, specifically with the decentralization of education and health services. The fall in the financial autonomy index is not the result of lower revenue collection from the states, it is rather the result of increased decentralized public spending, in other words, subnational governments acquired new responsibilities in the provision of important services for the development of their jurisdictions but this process was not accompanied by greater responsibilities in terms of tax collection.

On the side of the financial dependence indicator, there was a considerable growth in 1994 and a high annual average of 81.1% during the period 1990-2012. In these same years, the behavior of the growth rates of the financial autonomy indicator was negative (-1.5%) while that of the financial dependency indicator showed a positive growth rate (0.8%).

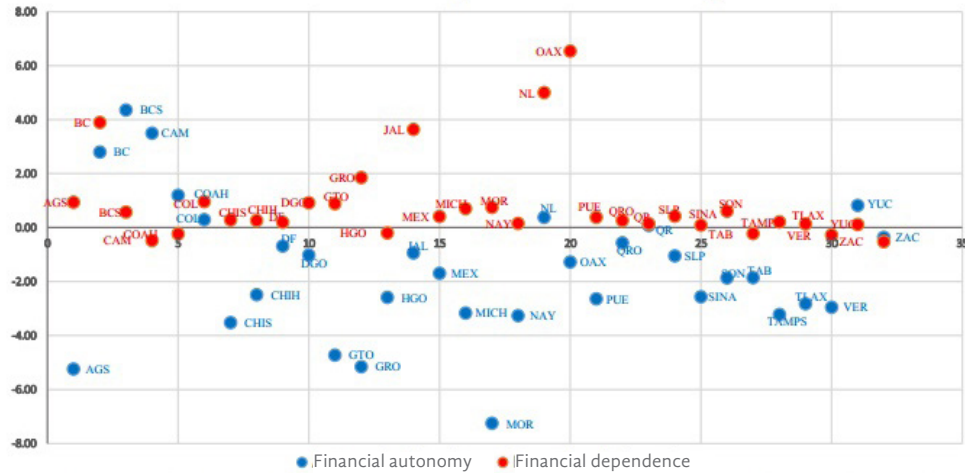
On average, the states with the highest financial autonomy index were Chihuahua (17.2%), Quintana Roo (12.0%) and Nuevo León (11.6%) and the states with the lowest autonomy were Oaxaca (3.1%), Tabasco (4.2%) and Guerrero (5.2%). In contrast, the states with the highest rate of financial dependence in the analyzed period were Tabasco (90.6%) and Zacatecas (89.7%), while Nuevo León (58.2%) and Baja California (62.3%) were the entities with the lowest financial dependency with the resources transferred by the central government.

If the average growth rate of both indicators is analyzed and for each federal entity, the state financial trend that has been developed under the tutelage of the current National System of Fiscal Coordination is observed. Based on chart 1, most states present a negative average growth rate of the financial autonomy index (blue dots); the only states that have increased their financial autonomy have been Baja California Sur, Campeche, Baja California, Coahuila, Nuevo León, Colima, Yucatán and slightly Quintana Roo.

The red dots indicate the average growth rate of the financial dependency index by states. Here we see positive growth, that is, the financial tendency of the states has been increasingly dependent on federal transfers, in this tenor, Oaxaca has been the state with the highest indicator growth while Coahuila, Campeche, Hidalgo, Tabasco, Veracruz and Zacatecas had a decreasing indicator.

**Graph 1.** Autonomy and Financial Dependency by federal entity Index  
(average growth rate 1990-2012)





Source: Own elaboration with INEGI data

In order to obtain the values of each parameter in the models it was first necessary to elaborate the Hausman Test and in this way to determine the characteristics of the data, in all cases the null hypothesis (Ho) was rejected and the alternative hypothesis was accepted (Ha), that is, of fixed effects. It is also important that for all cases the Durbin-Watson statistic was close to two, therefore, it is possible to ensure that the data do not present autocorrelation problems.

Estimated model for subnational governments in countries members of the OECD:

$$\text{Log (GDPpc)} = 9.998485 + 0.106428 \text{ Log [CR (-1)]} - 0.073935 \text{ Log [TR (-1)]}$$

**Table 3.** Statistics of the model used in the subnational governments of the countries members of the OECD

Observations	Hausman Test	R <sup>2</sup>	p-value	Durbin-Watson
125	Ha = Fixed effects	99.38%	Log [CR(-1)] = 0.0019 Log [TR(-1)] = 0.0072	1.76

Source: Own elaboration

To carry out the estimation of the model it was necessary to delay a period (-1) to the explanatory variables, this is generally due to the fact that the impact of transfers and consolidated revenues on GDP per capita are not generated in the same fiscal year. On the other hand, the model used a level of significance of 5%, resulting in the exogenous variables being statistically significant. The variable Log [CR (-1)] has a positive coefficient, in other

words, the model maintains a direct relationship between consolidated revenues as a percentage of GDP and GDP per capita for the case of OECD countries, i.e., an increase of one percentage unit of consolidated revenues as a percentage of GDP would be causing an increase in GDP per capita of 0.10%. The previous argument takes great relevance when affirming that there is empirical evidence to strengthen the levels of financial autonomy in subnational governments.

Contrary to what happens with consolidated revenues as a percentage of GDP, the variable  $\text{Log} [\text{TR} (-1)]$  has a negative coefficient, that is, the 1% increase in transfers as a proportion of GDP in member countries of the OECD causes a decrease in GDP per capita of 0.07%. It is important to be clear that the inverse relationship between both variables does not support a policy that goes against the transfer schemes and in favor of a centralized system; however, this inverse relationship can be explained through the fundamental principles of transfers. The resources provided by centralized governments are intended to complement and strengthen subnational budgets and in no case should be seen as a substitute for the collection responsibility of subnational governments.

In the methodological part of this work, the reasons for which it was decided to disaggregate the data and generate three explanatory models were pointed out. The first regression (1) relates the GDP per capita variable according to the indicator of financial dependence that only considers non-labeled transfers, that is, the federal participations in the branch 28; the second regression (2) analyzes again the GDP per capita in terms of federal contributions or also known as branch 33 and finally, the relationship between the product per person and the indicator of financial autonomy in subnational governments is analyzed (3).

Estimated models for subnational governments in Mexico:

$$\text{Log} (\text{PIBpc}) = 11.48527 - 0.001269 \text{ IDF28} (-1) \dots \dots \dots (1)$$

$$\text{Log} (\text{PIBpc}) = 11.40602 + 0.000709 \text{ IDF33} (-2) \dots \dots \dots (2)$$

$$\text{Log} (\text{PIBpc}) = 11.43695 + 0.001913 \text{ IAF} (-1) \dots \dots \dots (3)$$

**Table 4.** Statistics of the models used for subnational governments in Mexico

Observations	Hausman Test	R <sup>2</sup>	p-value	Durbin-Watson
--------------	--------------	----------------	---------	---------------

420	Ha = Fixed effects	99.19%	IDF28 (-1) = 0.0028	1.94
390	Ha = Fixed effects	99.16%	IDF33 (-2) = 0.0381	1.97
420	Ha = Fixed effects	99.17%	IAF (-1) = 0.0580	2.01

Source: Own elaboration

The explanatory variable presented a p-value below 0.05 providing us with security to accept the coefficient of -0.0012, note that it has also had to lag behind a period (-1). According to the results of the regression we can say that the indicator of financial dependence with respect to federal participations bears an inverse relationship with GDP per capita in such a way that if the IDF28 in a state increases by 1%, the income per person of this same entity would be reduced by 0.0012%.

In regression (2) a positive coefficient was observed for the indicator of financial dependence with respect to federal contributions, using a two-year lag (-2), therefore, an increase of 1% of IDF33 (-2) would cause an increase in GDP per capita of 0.000709%. Unlike what the IDF28 presented, here you can see a progressivity on the part of the resources of the branch 33, that is, the objective of these resources has been to compensate and reduce the disparities between the states through promoting greater equity in Access to services such as education and health.

Finally, the results obtained from the regression (3) show us the existence of a direct relationship between the financial autonomy index and the GDP per capita in the states. Increasing the indicator of financial autonomy of entities in a percentage unit could mean an increase in GDP per capita of 0.0019%, which would be even higher than the increase of 1% of federal contributions, in this context, it is important that states assume a greater fiscal responsibility by increasing their own income and reducing the financial dependence that has maintained on federal transfers.

## CONCLUSIONS

The processes of local development are accompanied by the direct participation of the most important actors in society. The government is an important actor in the detonation of development but not the only one, in this sense, the participation of society is fundamental to make transparent the public resources managed by the states and which are aimed at promoting the development of their regions. For the local development approach it is important to increase the financial autonomy in terms of collection and the ultimate goal

of resources, in this regard, economic growth plays an important role since without this it would not be possible to finance local development policies.

Empirical evidence at the international level shows the impact that financial autonomy has on economic growth and, therefore, on development. The estimated model for the case of subnational governments in OECD countries presented two important parameters, the first of which was the parameter that accounts for the inverse relationship between transfers and GDP per capita, but this did not happen with consolidated revenues (financial autonomy) since it presented a direct positive relationship with the product per person; that is, the parameter of the variable  $\text{Log} [\text{CR} (-1)]$  means that financial autonomy in OECD countries has been important in the growth and socioeconomic development.

In the case of subnational governments in Mexico, behavior similar to that of the OECD countries was observed. Federal participations (branch 28) presented a negative parameter in relation to GDP per capita by state; however, for the case of federal contributions was the opposite, that is, the increase in resources from branch 33 has had a positive impact on GDP growth per capita. More important has been the value of the parameter that showed the indicator of financial autonomy that besides being positive, was greater than the parameter of the federal contributions, in this sense, a proposal to increase the financial autonomy of the subnational governments could mean a first step towards true processes of local development. In the not too distant future it will be necessary to include in the public agenda a local development policy that considers the increase of subnational autonomy.

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# RECENT TRENDS IN INTERNAL MIGRATION IN NUEVO LEÓN, MEXICO

—  
Yuliet Bedoya Rangel<sup>1</sup>  
yulietbedoya@gmail.com

José Alfredo Jáuregui Díaz<sup>2</sup>  
alfjadi@yahoo.com.mx

Ma. De Jesús Ávila Sánchez<sup>1</sup>  
marycolef@yahoo.com

Esteban Picazzo Palencia<sup>1</sup>  
epicazzo@yahoo.com

1 INSTITUTO DE INVESTIGACIONES SOCIALES, UNIVERSIDAD AUTÓNOMA DE  
NUEVO LEÓN, MÉXICO

2 UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN, MÉXICO



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— Abstract—

Nuevo León State, Mexico, has historically been a pole of population attraction at the national level, the population growth recorded in this geographic space during the last 50 years is largely a product of immigration processes, stimulated by economic growth of a growing industrial sector, which generated a labor demand that without the arrival of population from other parts of the country would not have been possible to cover.

This research presents the recent trends of immigration in Nuevo León using as a primary source of information the Intercensal Survey 2015 of the National Institute of Statistics and Geography (INEGI), which analyzes some contextual variables such as sex, age, Indigenous speaking status and schooling. As a reference, data derived from the 1970, 1990, 2000 and 2010 censuses are also used, because it is not possible to understand the present without understanding the past.

### Keywords

*Internal migration; Nuevo León; labor maker; aging.*



Studying internal migration as a social phenomenon is essential to know the spatial distribution, demographic dynamics and changes in a population. This research is based on the assumption that population mobility can only be understood if we observe the interaction of economic and social factors at different scales, as well as their own characteristics.

Studies of migration from the local perspective are essential for the planning and development of sectoral and multisectoral public policies -transportation, infrastructure, housing, urban and rural development, among others- for the implications of these changes in the amount and profile of the relevant requirements for such policies.

Several factors, such as the abandonment of the countryside in pursuit of an industrial development, coupled with the ease of displacement contributed to put mobility in first place next to nearby migration circuits. In a second moment, geographical distance has ceased to be a migration barrier, due to technological progress and the development of transport systems.

Partida (1994) using census data showed how the unequal distribution of social and economic development between the different regions is the main cause of internal migrations in Mexico. Chávez (1999) delves into the issue and points as a trigger for migration, inequality understood as "a manifestation of the way in which the economic, political and social structure of a country is shaped. It is expressed, in general terms, in the differential access that the population has to the basic satisfactions that allow a dignified life "(p.20).

This way, migrations have been transformed, not only from points of origin and destination, as shown by several investigations (Partida, 1994; Corona, 1996; Pimienta, 2002; Romo, Téllez and López, 2013), but also from the migrants' point of view.

The objective of this research is to present the recent trends of immigration in Nuevo León. In a schematic way, the research is divided into five sections, the first of which is called methodology and describes the sources of information used in its preparation; the second named "Internal migration in Nuevo León-Context 1970-2010" and deals with two aspects, the first describes the main studies on internal migration carried out in Nuevo León, the second presents the trends of internal migration in Nuevo León 1970-2010; the third is the results where the recent trends of internal migration are exposed in Nuevo León, Mexico; a fourth section is devoted to the conclusions; and in the fifth the bibliography used in the elaboration of the research is stated.

## METHODOLOGY

In carrying out this research, the census microdata of the years 1970, 1990, 2000 and 2010 are used as primary sources of information, in addition to the intercensal survey conducted in 2015 by the National Institute of Statistics and Geography (INEGI). Two variables captured by the sources of information referred to, were fundamental in the analysis presented here, the place of birth and place of residence five years before, as well as contextual variables such as sex, age and cumulative schooling, among others.

### INTERNAL MIGRATION IN NUEVO LEÓN - CONTEXT 1970-2010

#### *a) Studies conducted on internal migration in Nuevo León*

Interest in the study of migration to Nuevo León began in the late sixties and early seventies of the last century, a historic moment in which migration to the city was a growing phenomenon in the country's main capital cities; the pioneering study on migration, named *Occupational structure and social mobility (The case of Monterrey)* by Balán and Jelín from 1973, where they point out, among other things, that under certain conditions migrants arriving in Monterrey compete successfully with the natives, and in most cases experience a certain social ascent in relation to those that do not migrate. "This social ascent is explained by the occupational opportunities that Monterrey offers" (p.240).

Another study of the seventies in Nuevo León is the one carried out by the state government in 1977, which was called *Demographic Aspects of the State of Nuevo Leon: brief description of some demographic indicators and sources of information*, that although it is not specializing in migration treats the issue tangentially as one more variable that should be considered in the study of demographic dynamics. During the following decade there were practically no studies on migration in Nuevo León, it is until the nineties that the interest in migration began again.

In the nineties the study conducted by Valero and Tijerina (1998) Immigration to the metropolitan area of Monterrey, wages, employment and occupation, 1985-1996 stands out, which conclude that historic immigration to the State of Nuevo León has been decreasing since 1965 and fell stronger between 1985-1990; it was also characterized as coming from neighboring states. Regarding the relationship between education and income Valero and Tijerina highlight that in the Metropolitan Area of Monterrey the income

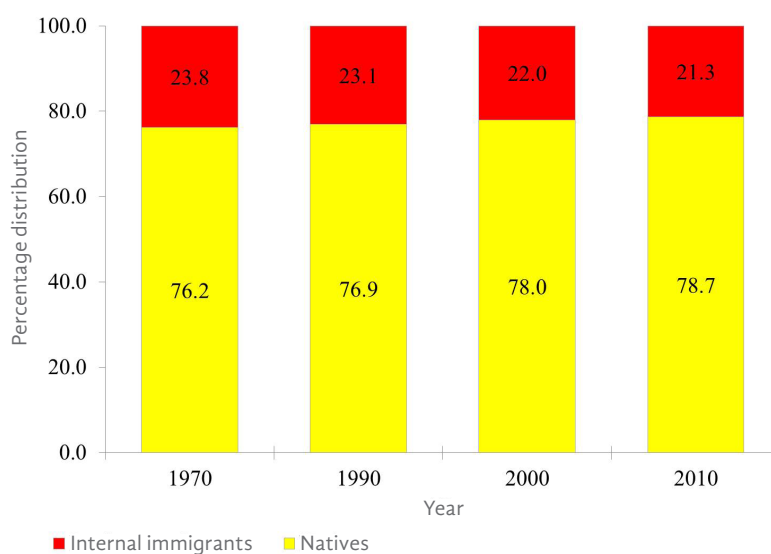
of the most educated is greater; and it is shown that immigrants are not only placed in traditional sectors of the economy but move to the sectors of greater profitability.

In the first three decades of this century, studies on migration have focused on subgroups of migrants residing in Nuevo León as an indigenous population and domestic workers from an anthropological perspective (Durin, 2003; Durin, 2003a; Durin, 2012; Durin, 2013; Velázquez, 2014). Other studies carried out, which come out of the previous classification, are those of Solís in 2007 on inequality and social mobility in Monterrey; Sanchez, Luyando, Aguayo and Picazzo (2014), which deals with sustainable labor development and its relationship with internal migration in Mexico; and that of Jáuregui, Ávila and Bedoya (2017), where the aging process of the migratory flows that arrived in Nuevo León in the sixties and seventies is dealt with.

#### *b) Internal migration trends in Nuevo León 1970-2010*

In four decades spanning between 1970 and 2010, the migratory process to Nuevo León has been a living entity with a growing dynamic. As can be seen in Image 1, the proportion of immigrants residing in Nuevo León remained above 20 percent of the total population, that is, one in five inhabitants in Nuevo León was born in another entity of the country.

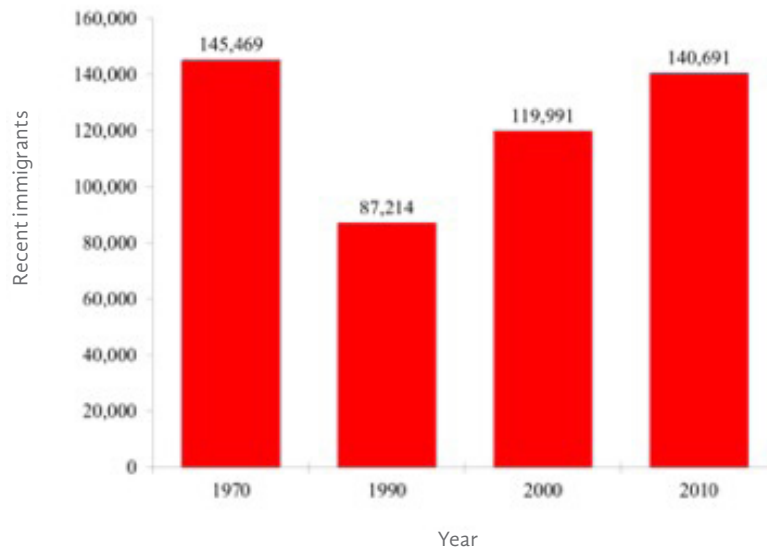
**Image 1.** Percentage of immigrants and natives residing in the State of Nuevo León, 1970, 1990, 2000 and 2010



Source: Own elaboration based on census microdata, 1970, 1990, 2000 and 2010, IPUMS 2016

Immigration in Nuevo León was encouraged by the economic growth of the industrial sector since the mid-20th century, which generated a demand for labor that without the arrival of population from other parts of the country would not have been possible to cover. According to statistics on recent migration<sup>1</sup>, the years in which the state has received more national immigrants was in 1970 (Image 2), however the arrival of immigrants has not stopped over time.

**Image 2.** Recent immigrants residing in the State of Nuevo León, 1970, 1990, 2000, and 2010

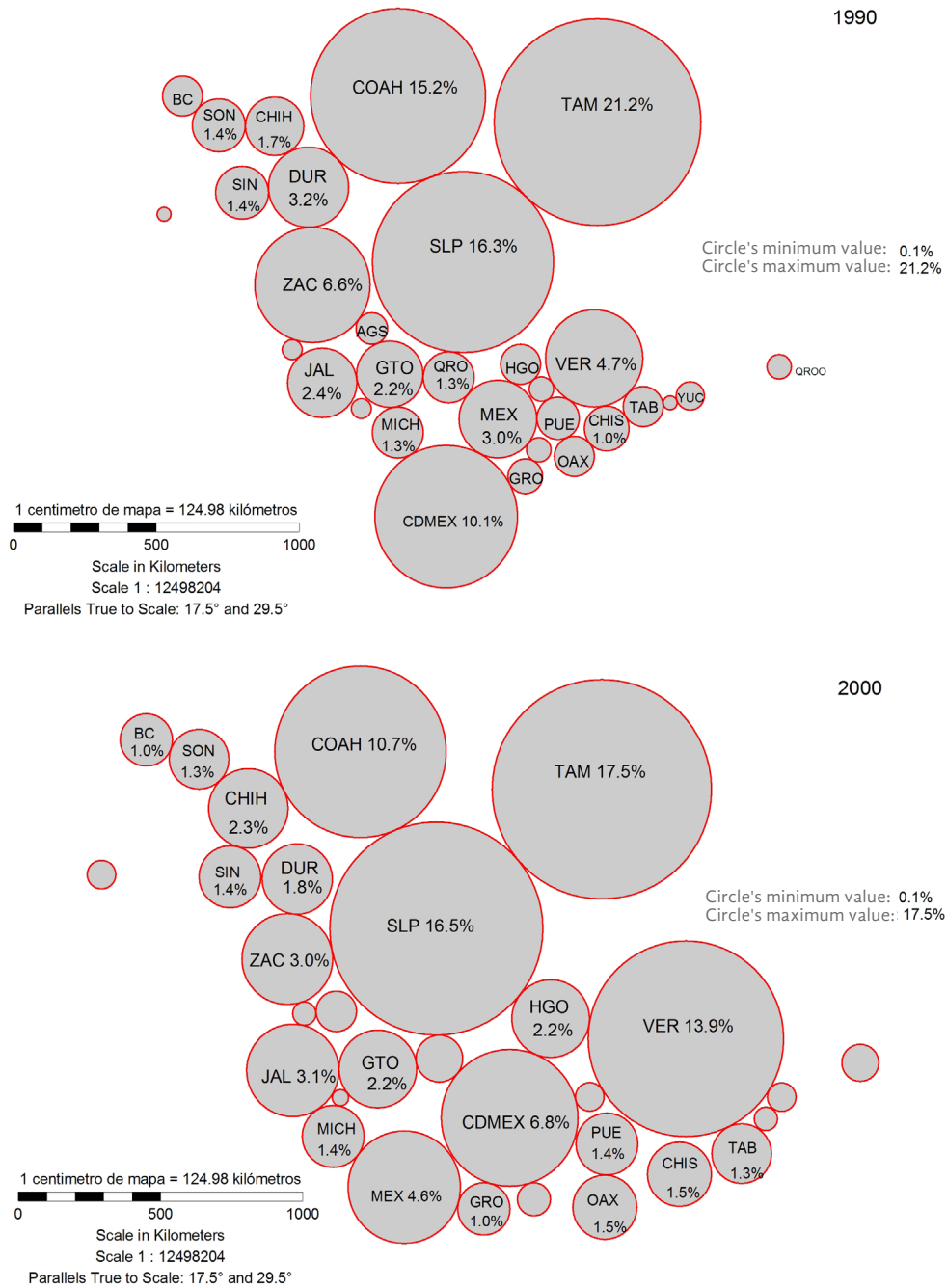


Source: Own elaboration based on census microdata, 1970, 1990, 2000 and 2010, IPUMS 2016

These recent immigrants in Nuevo León come primarily from neighboring entities such as Coahuila, San Luis Potosi, Tamaulipas or Zacatecas, although with the increase in roads and means of communication and transportation that shortened distances, makes it easy to arrive at immigrant entities throughout the country, for example, immigrants can come from entities such as Hidalgo, Jalisco and Oaxaca (Image 3).

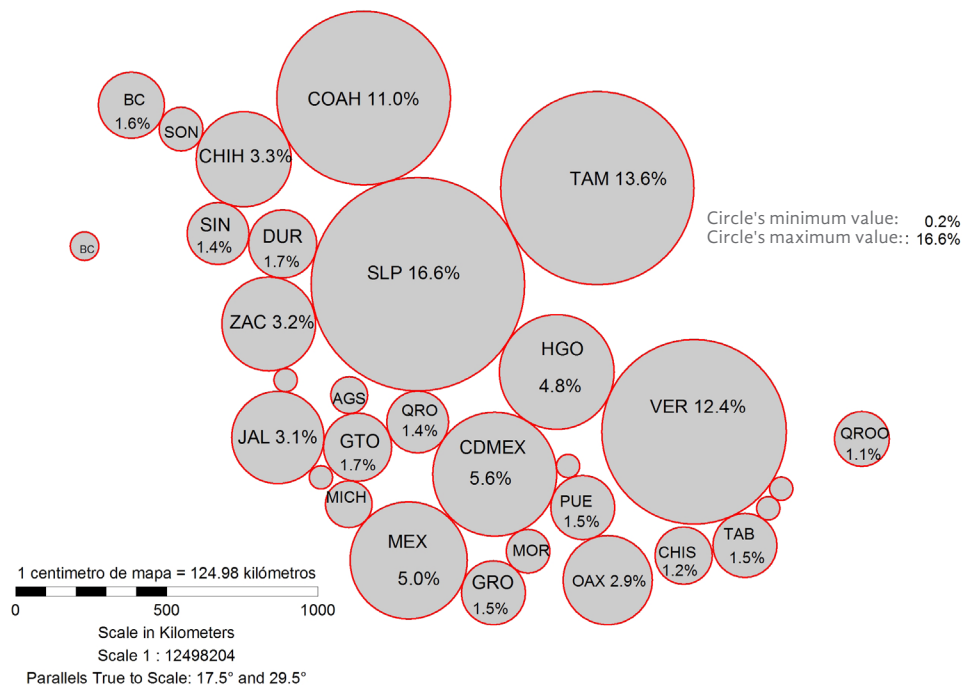
1 It is understood as recent migration the set of people resident in Nuevo León who, at a given time, lived 5 years ago in an entity other than Nuevo León.

**Image 3.** Entity of origin of recent immigrants, 1990, 2000 and 2010<sup>2</sup>



2 The data for the year 1970 are omitted because the recent migration variable was not captured in addition to the year 1980 because it is a census with a high rate of non-response.

2010



Source: Own elaboration based on census microdata 1990, 2000 and 2010, IPUMS 2016

Among the socio-demographic characteristics of recent migrants stand out in the years 1990, 2000 and 2010:

- A small female preponderance, 109 women arrived in Nuevo León for every 100 men, which has remained constant during the period 1970-2010, a trend related to a high supply of employment in economic activities associated with the female role, such as domestic service (Durin, 2013 and Velázquez, 2014), although these market niches are generally characterized by job insecurity as indicated by Huerta (2014).
- The age cohort is concentrated in productive ages because more than eighty percent are in the age group of 15 to 64 years, of which 25 percent are between 20 and 34 years old, a similar proportion belongs to the group 35- 49 years.
- The schooling of immigrants has increased in the study horizon in two years, from 7.2 years in 1990 to 9.2 years in 2010. On average they have one more year of schooling than the natives, a difference that has been preserved even with the increases in schooling recorded by the natives.

One fact that cannot be overlooked is the rapid aging process that is developing among the internal immigrants of Nuevo León which reaches three times the same process in the native population (Jáuregui *et al.*, 2017).

Among the immigrants, a group of special relevance is the speakers of indigenous language, while in 1970 there were barely 1,000 people. By 2010, there were 45,043 people. Although, numerically, they only represent 1.1 percent of the population, indigenous migrants show a sustained growth dynamics throughout the study horizon, so it is clear that the trend will continue in the future, consolidating Nuevo León as a labor destination for indigenous immigrants of the country.

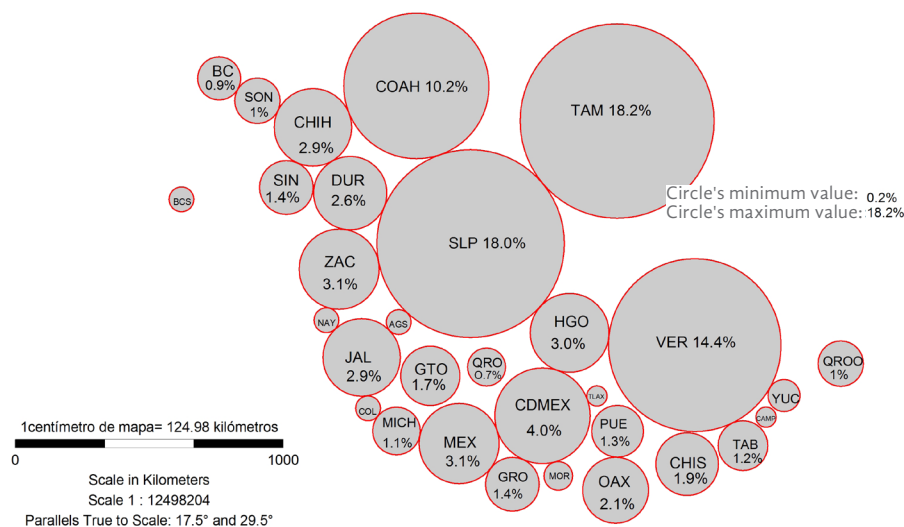
## RESULTS

In 2015, 1,032,567 of people born in another state reside in Nuevo León and represent 20.6 percent of the total population, that is, one out of every five people are immigrants. This population group is characterized by increasing with the population in general, so that at a percentage level it remains almost constant since 1970.

Recent migrants, that is, those who live in the entity in 2015 but who in 2010 were settled in other parts of the country, amount to 164,552 people. Fifty percent comes from places bordering Nuevo León, such as Tamaulipas, San Luis Potosí, Coahuila and Zacatecas, the rest moved from other places, highlighting its importance, in the center of the country, Mexico City, Hidalgo and the State of Mexico, in addition to Veracruz in the southeast (Image 4), together these entities represent almost a third of the total of migrants.

**Image 4.** Percentage distribution of recent migrants in Nuevo León according to entity of origin, 2015





Source: Own elaboration based on census microdata of the Intercensal Survey 2015, IPUMS 2016

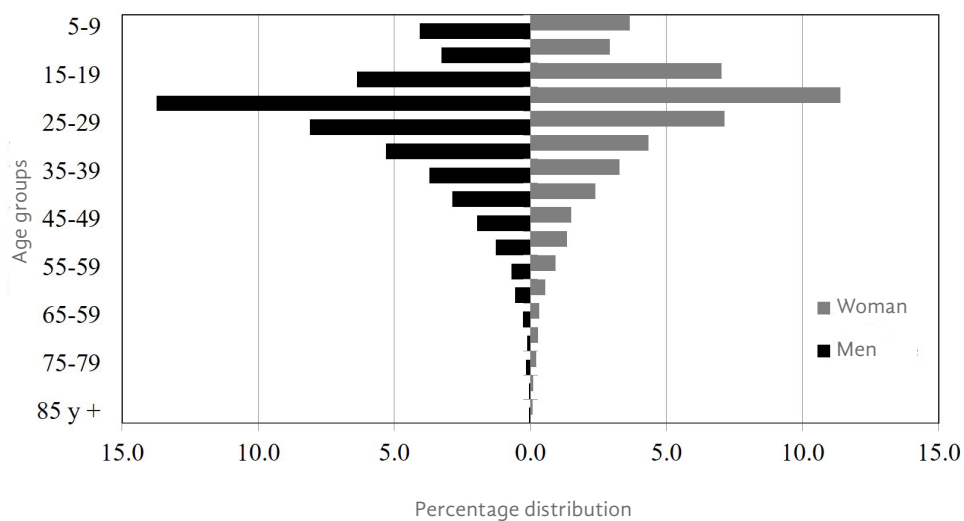
The recent migrants are a group that is characterized by a composition by sex with a small male predominance, 52.6 percent are men and 47.4 percent women, a perceptible trend with greater detail in the masculinity index that registers 111 men for every 100 women.

It is important to note that these data show a change in relation to what was observed in the past (period 1970-2010), so we should analyze in detail how the labor market has changed in Nuevo León and specifically some activities such as domestic work, that allow us to understand the change in the composition by sex of the migrants.

An inherent characteristic of recent migrants is that they are concentrated in productive ages between 15-64 years age group since it concentrates 84.4 percent of the total, the rest 13.9 percent is made up of the drag migration group, integrated by children of immigrants and the elderly (Image 5).

The accumulated level of education measured in years of study among recent immigrants registered an average of 9.7 years and a median of 9 years, although within the group there is great heterogeneity, on the one hand one in four has an average of 6 years of study, in counterpart a similar proportion registers an average greater than 12 years of study.

**Image 5.** Structure by age groups of recent migrants in Nuevo León according to entity of origin, 2015

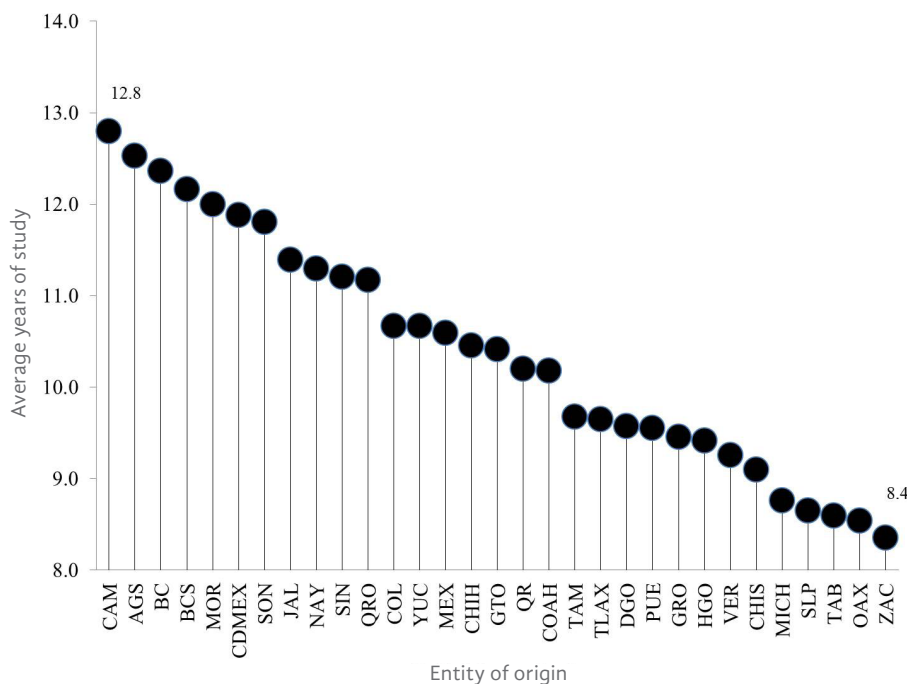


Source: Own elaboration based on census microdata of the Intercensal Survey 2015, IPUMS 2016

When analyzing the average of the accumulated schooling by entity of origin of the immigrants, there are gaps greater than four years, as in the case of those from Aguascalientes in opposition to those of Zacatecas, a pattern that could be related to the niche of economic activity in which they are inserted and the degree of specialization of migrants<sup>3</sup> (Image 6).

**Image 6.** Average schooling accumulated in years of recent migrants in Nuevo León according to entity of origin, 2015

3 The labor market in Nuevo Leon is so large that it needs both migrants with low levels of education to perform low-skilled activities and migrants with high levels of education to perform highly qualified activities.



Source: Own elaboration based on census microdata of the Intercensal Survey 2015, IPUMS 2016

The economic activity of recent migrants corroborates the variability of jobs in which they are inserted into the labor market, while 4.2 percent hold positions as director, coordinating manager or area manager, 19.6 percent perform elementary and support activities. Depending on the entity of origin, some specialization is registered in niche markets, for example, 24 percent of street vendors come from San Luis Potosí.

The monetary income that can be obtained in Nuevo León is a factor of attraction. Recent immigrants have an average income of \$8,402, similar to the average of the *Neoleoneses*, \$8,558; however, depending on the place of origin and economic activity, a great variability can be seen. Thus, those from San Luis Potosí earn less than \$ 6,000 per month for their work, while those who arrived from Mexico City earn a monthly average of \$14,813. Although a strong correlation between income and cumulative schooling was to be expected, as indicated by the literature, in the case of Nuevo León a very weak relation of 0.158 was obtained for 2015.

## CONCLUSIONS

The results presented in this paper constitute a first approach to the migration dynamics of Nuevo León developed over a period of 45 years, between 1970 -2015, but it is necessary to make more complex its analysis and conduct

studies according to the characteristics of the migrants according to their place of origin, economic activity, schooling, among others. In addition, it would be necessary to show how these variables are correlated.

On the trends of recent migration in Nuevo León, the following stand out:

- Consolidation of the traditional flows of immigrants from bordering states such as San Luis de Potosí, Coahuila and Zacatecas, along with a strengthening of migrants from central and southern states, such as Mexico City, Hidalgo, State of Mexico and Veracruz.
- Changes in the sex variable between immigrants, where the relationship between men and women, which used to favor females, is reversed.
- Concentration in productive and young ages, for example the age group 20-29 years represents more than 20 percent of the total.
- A cumulative schooling variable depending on the place of origin where a gap of more than four years is observed, as it happens with those from Aguascalientes and Zacatecas, two neighboring entities.
- A diverse labor market, with a need for migrants with different degrees of qualification.

Some facts are glimpsed, such as the population aging that they are experiencing as a result of the age of the first migratory arrivals, the diversification of the places of origin, the dynamics of growth of the indigenous people and the changes in the composition by sex, which makes the flow of migrants residing in Nuevo León increasingly heterogeneous.

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# CHILD LABOR AND FOOD INSECURITY IN CHIAPANECOS CHILDREN, A CASE STUDY

—

Octavio Grajales Castillejos  
Ana Daniela Villaseñor Rodríguez

estadi@unach.mx

CENTER OF STUDIES FOR DEVELOPMENT AND PUBLIC POLICIES  
UNIVERSIDAD AUTÓNOMA DE CHIAPAS, MÉXICO



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— *Abstract* —

The article presents results of a research on child labor, which *aimed* to identify the risk factors of child labor and food insecurity in Tzotzil children, in the state of Chiapas; for which a case study was conducted during the period 2015-2016. For this, a qualitative cross-sectional investigation was carried out during the period 2015-2016. The *results* show that girls and boys come from poor municipalities bordering the municipal district of San Cristóbal de Las Casas: Chamula, Chenalhó, Zinacantán, Oxchuc, Teopisca, Simojovel, San Juan Cancún, Amatenango del Valle and Chanal. The environment in which children work in the region exposes them to suffer diseases of all kinds, which, together with the unhealthy conditions and the food insecurity to which they are subjected, makes them even more susceptible. One of the conclusions of this research is that it is dedicated to the efforts of the various international, national, state and non-governmental organizations involved in mitigating child labor but have not yet achieved the desired results.

**Keywords**

*Child labor, food insecurity, poverty.*

The participation of children in family chores has existed in the history of mankind; however, the conceptualization of child labor has its origin in the Industrial Revolution, a movement with countless social and economic transformations that took place with the development of modern industry (Giddens A. 2009). These social and economic changes referred to by Giddens, have spread throughout the world, appearing with it generations of the working class, a fact that has been breaking the harmony of production processes.

The meaning of child labor today at the international level, is the product of the indicators of the Resolution of the Eighteenth International Conference of Labor Statisticians, in Geneva 2008, seen in the Workshop on Analysis of the Child Labor Module, which recognizes child labor as the participation of a girl, a boy or a teenager in a productive activity that takes place outside the law, whether below the minimum age for admission to employment according to the national legal framework; prohibited by its nature or exposure condition, being dangerous and unhealthy and that can produce negative effects, immediate or future, for their physical, mental, psychological or social development, and that for long hours, limit or prevent the enjoyment of their human and labor rights, especially assistance or permanence in school. And it makes a distinction with the training activities required by children and adolescents to obtain the necessary skills that allow them to prepare and develop the necessary competencies that adult life implies (ILO, 2016).

The International Labour Organization (ILO) warns of considerable differences among the many forms of work carried out by children. Some are difficult and demanding, others are more dangerous and even reprehensible from the ethical point of view. In the framework of their work, children perform a very wide range of tasks and activities.

In this regard, the ILO considers that in order to define child labor, it must first be taken into account that not all the tasks carried out by children should be classified as child labor, therefore, we must learn to differentiate which are the activities that are considered as such. In general, the participation of children or adolescents in jobs that do not threaten their health and personal development or interfere with their education is considered positive. Among other activities, such as help at home, collaboration in the family business, extracurricular tasks, or work activities during the holidays to contribute to family expenses and thereby mitigate poverty a bit; these types of activities are considered beneficial for the development of children. Also, it is considered that it helps them prepare to be productive members of society as adults.



In this context, the term "child labor" is usually defined as: all work that deprives children of their childhood, their potential and their dignity, and that is detrimental to their physical and psychological development. In this sense, the ILO calls child labor those activities that are dangerous and harmful to the physical, mental or moral well-being of the child; those that interfere with their schooling since: it deprives them of the possibility of attending classes; it forces them to leave school prematurely, or requires them to combine the study with a heavy and time-consuming work.

### REGULATORY FRAMEWORK

The regulatory framework in Mexico, as in other parts of the world, on the protection of children against child labor is based on the *Convention on the Rights of the Child of the United Nations*, ratified by Mexico from September 1990 and later in 2000, as well as *ILO Agreement 182*, on the worst forms of child labor. Specifically, Article 32 of the Agreement obliges States to take legislative, administrative, social and educational measures to address child labor (UNICEF, 2006). Therein lies the importance of the Mexican State taking seriously the responsibility of overcoming the international backwardness it faces by maintaining only a welfare policy and lacking a National System for Guaranteeing the Rights of Children, without which government actions and programs will continue without change the difficult reality that most girls, boys and adolescents in Mexico experience (REDIM, 2016).

### CHILD LABOR AND ITS RELATION TO FOOD INSECURITY

Studies show that the decrease in economic income in families is directly proportional to the increase in child labor, mainly in places with high marginalization. Poverty and the poor are defined (...) based on economic and homogenizing criteria. This situation has resulted in imprecise characterizations (Jiménez & Gómez, 2012, page 14). Poverty, scarce financial support for education, lack of decent work for adults, regional inequalities and social exclusion of marginalized groups (INEGI, 2004, pp. 20-21) are causes and consequences of poverty and marginalization prevailing in the country.

Different studies have shown the association between food insecurity and adverse factors, such as inadequate consumption of energy and nutrients, decrease in food supplies in homes, emotional problems in children, and obesity (Rose D, Oliviera V., 1997).

The term "food security" has been defined by the Food and Agriculture Organization of the United Nations (FAO) as follows:

There is food security when all people have at all times physical and economic access to sufficient safe and nutritious food to meet their food needs and food preferences in order to lead an active and healthy life "(World Food Summit, 1996).

Although FAO (2015) reports that hunger rates are below the 5% threshold in Argentina, Brazil, Chile, Costa Rica, Mexico, the Bolivarian Republic of Venezuela and Uruguay. It is clear that in the entities of the South-Southeast of Mexico these figures are very far from being true since for decades the states of Oaxaca, Guerrero and Chiapas have occupied throughout history the disgraceful first places in the low rate of human development and high degrees of marginalization indexes, consequently they are the poorest entities.

According to the National Council for the Evaluation of Social Development Policy (CONEVAL), the population living in poverty in Chiapas is 74.7% in 2012 and 76.2% in 2014, a figure that shows that Chiapas is getting poorer; consequently, its food insecurity situation is accentuated even more. This information indicates that progress in reducing various social needs has not been presented for Chiapas, Guerrero and Oaxaca.

The information from the Child Labor Module 2015 (MTI) reveals that Chiapas has a total population of 5,277,524 inhabitants, of which 49.25% are men and 50.75% are women. Of the total of its inhabitants, 29% (1,530,205) are children and young people between 5 and 17 years of age, of which 10.37% (158,776) of children and young people only 3.4% (5,403) develop their activities under permitted conditions, while 153,363 (96.6%) do so under conditions not allowed, of which 99,231 (64.7%) do so in hazardous occupation and 54,132 (35.3%) under the minimum age. To this data we should add the 136,783 children and young people who perform domestic work in unsuitable conditions; it is striking that in this particular indicator, women represent the highest percentage (51.4%).

Of the 153,363 working children, 61% carry out their activities in the primary sector, 7.6% in the secondary sector, 30.8% in the tertiary sector and the rest (0.6%) not specified. Regarding the duration of the usual workday, 27.6% of children and young people of both sex, work up to 14 hours a week, 27.5% more than 14 up to 36 hours, 20.6% more than 36 hours and 24.2% do not have a work schedule. Of the child labor carried out by children and young people from Chiapas, most do not receive income (64.3%), 25.5% receive up to a minimum wage, 8.3% up to two minimum wages and only 2% earn more than two minimum wages. It is important to consider that we could add to this data qualitative information that specifies the particular conditions of each child and young person who performs some type of work (MTI 2015, INEGI).

Based on these figures, we can show the relationship that child labor has with food insecurity, since both are directly related to poverty; that is why the present investigation *aims* to identify risk factors of child labor and food insecurity in Tzotzil children, from the state of Chiapas; for which a case study was conducted during the period 2015-2016. The investigation was carried out in the municipal seat of San Cristóbal de Las Casas, Chiapas; because it is the city with the greatest number of tourists and, consequently, where is tangibly observed the greatest concentration of children working, children who come from the neighboring municipalities of the region.

## METHODOLOGY

The study was carried out in the municipal seat of San Cristóbal de Las Casas, Chiapas; prior to the interviews, government and non-governmental organizations were visited, which referred to carrying out studies on street children; and commented that they had identified children from municipalities around the Capital, including: Chamula, Chenalhó, Zinacantán, Oxchuc, Teopisca, Simojovel, San Juan Cancúc, Amatenango del Valle and Chanal.

To analyze the problem of child labor in the V Tsosil-Tseltal region of the state of Chiapas, it was necessary to identify the risk factors of child labor and food insecurity in Tzotzil children in the state of Chiapas; for which a case study was conducted during the period 2015-2016. For this, on-site visits were made to the municipal seat of San Cristóbal de Las Casas, with the purpose of meeting the girls and boys personally, the causes for which they are forced to work, what they eat during and after their day of employment, where they sleep, their origin, with whom they live, among other variables that provide elements of analysis.

To locate the work areas of the children under study, a mapping was carried out, as a result of which 9 zones were established in the municipal capital; which were formed as follows: Central Park, Arco del Carmen, Santo Domingo Park, Andador Real de Guadalupe, Municipal Market José Castillo Tielmans, Ant Market, Popular del Sur Market, Mercalito and Zona Norte Market.

Once the work areas were located, each of them was explored to identify the environment in which the children live and work; for this, it was necessary a preliminary approach to the interviews (*primary source*), which consisted of creating an atmosphere of trust and at the same time identifying key informants, who subsequently gathered groups of children from each established area to participate in the study. During the interviews and the analysis of secondary sources, we sought to gather as much information as

possible about the factors that force them to work at such an early age, as well as their socio-demographic conditions.

To carry out the data recollecting process, a *semi-structured interview guide* was designed which allowed deepening into the categories of this research: health, food, education, leisure time, definition of child labor and working hours. The inclusion criteria were: children working in the municipal capital of San Cristóbal de Las Casas, who expressed their willingness to participate in the study and who also spoke Spanish, regardless of whether they spoke an indigenous language, and who had an age that oscillated between 11 and 14 years of age, since in previous visits it was identified that children of 10 years and less, could not express themselves with the clarity required to respond to the items of the interview. The primary information was collected through the nine groups of children (31 children in total) in their respective work areas.

## RESULTS

Nearly 60% of boys and girls (mostly boys) have been incorporated from an early age into economic activities as companions of their parents or siblings; therefore, they perceive child labor as a natural and optimal activity for their age. Most of the children mentioned that they are directly responsible for their inclusion in the workplace; however, it is a contradictory response when compared to when they were asked if they work compulsorily, since 90% reported being forced to work by their parents or guardians; they also commented that most of the profits are given to their parents. 40% believe that it is okay for children to work, since that income allows them to cover part of their basic needs such as food, support the family in life projects, such as building their house, or generate savings for health emergencies, as well as covering educational expenses, among others.

The reality shows us that the income received in each working day are sufficient only to survive, since they must cover the quota assigned by the father or his employer, which ranges between 80 and 100 pesos per working day, which shows that they hardly achieve collect an extra amount that allows them to buy food and personal items such as clothing, shoes, medicines or personal hygiene products.

Regarding education, despite the fact that the children claim to attend school, the data obtained from the public institutions themselves show that there is an assiduous absence, due to the lack of interest on the part of the parents and the children themselves; in addition to this situation, the

frequent suspension of classes due to teacher and community problems, accentuates this problem. In summary, the children expressed that they learn little or nothing in school, which can be due to two causes: First: the work actions mentioned by the teachers and secondly: by the frequent absence that the children present during the school year, derived mainly from the need of economic resources to pay for family expenses, as well as the parents' ignorance about the importance and benefits for their children, as well as that of their own families.

Regarding the health of children, environmental exposure in their working hours makes them more susceptible to suffer diseases of all kinds, caused by factors such as rain, cold, sun exposure and unsanitary conditions, which trigger: colds, flu, cough and those of a respiratory nature; as well as skin diseases expressed in fungi, symptoms such as redness, irritation, inflammation, burning, pruritus and possible allergies, in this respect 90% of the interviewees show skin injuries apparently derived from the long and exhausting work days under the sun, combined with the cold of the region, which reaches very low temperatures in some seasons; on the other hand, derived from unhealthy conditions are susceptible to suffering gastrointestinal diseases, lice and other types of parasites.

Children who mentioned working longer or performing excessive loads (60%) reported that it causes pain in legs, feet, knees, waist, head, etc. This dynamic to which they are subject over time predisposes them to impairments in the development of the musculoskeletal system and can, in the worst case, cause them some disability. It is evident that fatigue prevents them from having the strength to develop their cognitive abilities and generate skills that help them face adult life, as well as achieving better job opportunities. Added to this, poor care in their home can worsen their situation.

Even though the V Tsotsil-Tseltal region is highly productive in fruits and vegetables; the children under study lack access to these foods due to lack of money, since 70% of the children interviewed reported having one or two meals a day, which consists mainly of the intake of beans and many tortillas; the high consumption of junk foods (*chicharrín, frituras, volovanes, bottled sodas, etc...*) in which they invest a small part of the sales draws attention. They also said that they only eat meat when some people give it to them (already prepared), or when institutions feed them (mainly non-governmental).

Given the state of food insecurity in which these groups of children survive, the risk of malnutrition is high; however, this would be the least of the

problems if we consider that the complications they bring, such as fatigue, lack of concentration in classes for those children attending school, dental problems, little or no subcutaneous fat to mitigate the cold of the region, little immunity, among others, entails a low response capacity to face the constant risks to which they are exposed.

## CONCLUSIONS

It is to be expected that a federative entity such as Chiapas will present social problems of this nature, since it has occupied the last places in social welfare for decades, for which reason they are reflected in the lack of public services, lack of employment, marginalization, and consequence low human development index. Child labor is observed throughout the region; however, most of the cases are concentrated in the municipal seat of San Cristóbal de Las Casas; that is why the study took place in this city.

Despite the efforts made by the various international, national, state and non-governmental organizations that work to mitigate child labor, they have not achieved the desired results; since this problem is multidimensional; social, cultural and economic factors intervene, such as poverty, marginalization, illiteracy, among others. An additional factor is the lack of awareness among heads of families, as they see each of their children as another workforce, with what they try in volume, to reduce the poverty in which they are immersed.

Although the regulative framework on the rights of girls and boys in the Constitution of many countries is more complete each day, it is not enough, first, because it does not guarantee that it is applied as it is proposed, on the other hand, because there are still no ways for all children to assert their own rights, above all, because they do not know them and in many of the underdeveloped countries nor parents know of the existence of these rights, nor others that their Constitution grants them.

In short, the causes that foster the phenomenon of child labor and the insecurity to which girls and boys are exposed in the V Tsosil-Tseltal region of the state of Chiapas, despite being of a multifactorial nature, it can be asserted that it is as a result of the situation of poverty in which they find themselves, consequently, the parents of these girls and boys see in their children another labor force that can contribute to family spending, thus promoting child labor and in turn exposing them to suffer food insecurity, health risks, delay in their education and especially *the right to enjoy their childhood*.

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A C A D E M I C  
P A P E R



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# DO ECLIPSES CAUSE EARTHQUAKES?

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Idrish Huet Hernández  
Idrish.huet@gmail.com

Cristina Nieto Vasconcelos  
Miguel Fermín Rodríguez Arévalo  
Marcos Luan Castellanos Aguilar  
Jesús Alejandro Alfaro Gómez

FACULTAD DE CIENCIAS EN FÍSICA Y MATEMÁTICAS,  
UNIVERSIDAD AUTÓNOMA DE CHIAPAS, MEXICO



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**W**hy do we sometimes believe in statements like this? They sound reasonable or credible to some extent, come from sources with alleged authority, but we must not forget that science has been responsible for disproving many of these "reasonable" statements.

On August 21, 2017, a total solar eclipse took place in the United States; on September 7 and 19; two high intensity earthquakes (8.2 and 7.1 Richter degrees) were registered in our country with tragic consequences. Since then information began to circulate, especially in social networks, which relates a multitude of phenomena, including eclipses, with earthquakes. What is the basis of these claims? The idea behind them is that an alignment of the sun, moon and earth causes an effect capable of causing an earthquake. First, let's clarify that although the earthquakes are not predictable, it does not mean that they are totally mysterious, their causes are well understood from the geology, and among them we can say that there are volcanic, tectonic, sinking or displacement, among others, and it is known that any concentration of sufficiently large energy in the rocks of the crust can lead to earthquakes. The idea that this concentration of energy comes from an eclipse is unfounded. Let's reflect on this:

1. If the force of gravity is enough to produce movement in the gigantic and heavy rocks of the planet, it should also be able to greatly increase the tide of the seas and oceans that are much more fluid, but there are no swells during the eclipses. It is true that they increase the gravitational force but the increase is minuscule.
2. If the force of gravity of the eclipse was the cause, then why did not the earthquake happen in the United States, in the areas where the eclipse was total? That is, where the moon was exactly aligned with the sun and the gravitational influence was greater. Why did it happen in Mexico, where the eclipse was only partial?
3. Let's ask ourselves, if really the eclipse was the cause, why did so much time go by between one event and another? The eclipse was on August 21 and the earthquake in Chiapas was on September 7, while the second one happened in Mexico's City on September 19

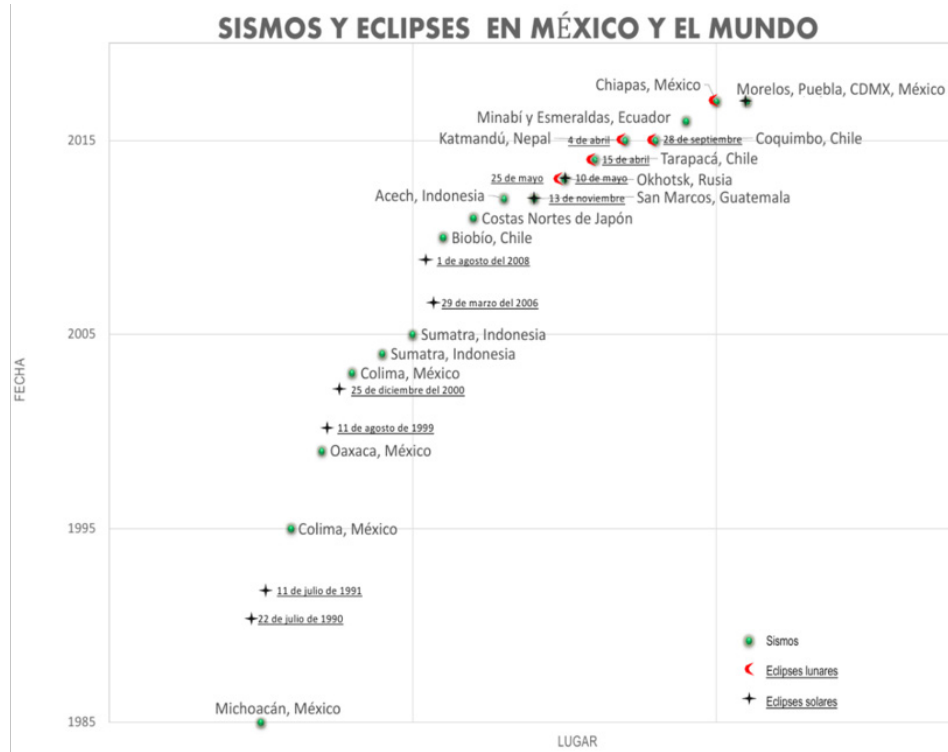
almost a month later! The action of the force of gravity between the moon and the earth takes 1.3 seconds to complete and between the sun and the earth it takes a little more than 8 minutes. It seems then too suspicious that the supposed effect has been felt so long afterwards. It is more natural to conclude that these are unrelated events.

Could it be that the force of gravity was not the cause but some other? Some news includes "magnetic fields" as the cause, or any other dubious origin. Science does not recognize "magical" forces due to an eclipse, but let's admit for a moment the possibility that there was some mysterious action of eclipses causing earthquakes. If this were true then there would be a pattern that would clearly relate eclipses to earthquakes, and we could discover it. Remember, for example, that there was not a devastating earthquake in 1991 in Mexico when a total solar eclipse occurred. Will it be that something similar is observed around the world?

Let's see the evidence, in the following graph we have collected data showing eclipses and strong earthquakes, of 7.1 Richter degrees or more, that have occurred around the world from 1985 to the present, as can be seen there are very few coincidences and if we see in detail the dates in which the events occurred we will realize that they do not fulfill the cause and effect relationship that would be expected according to popular beliefs. For example, on November 7, 2012 in San Marcos Guatemala there was an earthquake of 7.4 Richter degrees and later a solar eclipse visible in the same area on November 13, other similar cases that we can mention are those that occurred in Tarapacá (2014) and Coquimbo (2015) in Chile, where eclipses now of the lunar type occurred days after the earthquakes of April 15 and September 28 respectively. In general since 1957 there is a global record of a total of 21 strong earthquakes, 60 lunar eclipses and 57 solar eclipses, but only 14 lunar eclipses and 12 solar eclipses occurred in the same year as a large earthquake and for the same month or nearby dates there is only record of 5 lunar eclipses and 3 solar eclipses! So, we can conclude that there is no relationship between an earthquake and a solar or lunar eclipse. This evidence does nothing but discredit the catastrophic news and raises serious doubts about the supposed scientific authority of its researchers.

There will be a total solar eclipse in Mexico on April 8, 2024. Should we fear a similar catastrophe at that time? Not at all. Quoting Umberto Eco: "The Internet's drama is that it has promoted the fool of the people to the level of bearer of the truth." Is it not more convenient to reason on our own the information that comes to us, and thus form our own criteria, before giving credit to the alarmists?

Image 1. Earthquakes and eclipses in Mexico and the world



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SOME NOTES ON THE  
SUPRA RELATIONSHIPS AND  
SUBORDINATION BETWEEN  
DOCTOR-PATIENT AND THE  
HUMAN RIGHTS VIOLATIONS OF  
THE GERIATRIC PATIENT

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Raúl Sánchez Calderón  
doc\_rulas@hotmail.com

MEXICAN ASSOCIATION OF GERONTOLOGY AND GERIATRICS (AMGG)  
AUSTRALIAN ASSOCIATION OF GERONTOLOGY (AAG)



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The doctor-patient relationship is as old as humanity itself. If we place ourselves in the context of the first humanized tribes that inhabited the planet, we can see that those responsible for caring for the sick fell on the closest relative, usually parents or caregivers.

When there is a need for health or care of life, the patient enters a state of dependency and submission of the person in charge of restoring lost health, so there must be a relationship of Psychological Supra-ordination (to Doctors) and Psychological Subordination (of the Patient) based on respect and empathy towards the first one so that the second one submits his will to the knowledge of the doctor and the resulting therapy can be followed accordingly.

The figure of the patient's caregiver, usually the mother or father, is the key to success in the healing process.

In the old civilizations the DPR or Doctor-Patient Relationship is established, this relationship is spoken of, since the time of Hippocrates (Ayala: 1996) about 2,500 years ago. This model has remained to this day.

From the medical tradition of the eighteenth century, clinicians accept that disease is presented to the observer according to symptoms and signs that are distinguished by its semantic value and morphology. A symptom is the form under which the disease occurs, which is verbally expressed by the patient during the interview. It is the first transcription (translation) of the inaccessible nature of the disease. For his part, the clinician identifies the signs under the observation already oriented, by virtue of the preliminary conceptual images that he evoked when listening to the symptoms expressed by the patient (García: 1999).

The doctor knows that the sign announces what will happen, anamnesis what has happened, diagnoses what is currently developing; however, there is a difficult gap between the sign and the disease (García: 1999).

In some way, the institutionalization of medicine has modified the figure of the doctor in favor of them; transforming him into a technician, of cold and distant treatment.

The doctor who previously took care of the patient until he healed or died ... has almost disappeared. The doctor's mind has prioritized the acquisition of the scientific flow and has neglected to strengthen character and virtues to establish the traditional cordial links that united the patient with him. (Ayala: 1996)

With the growing dehumanization the medical ethics has become corrupted and medical behavior shows a distancing from the patient, today: Night calls are disregarded. There is doctor absenteeism on weekends. Chronic or terminal patients are abandoned. (Ayala: 1996)

The dehumanization of the doctor-patient relationship has multiple causes, we list some:

1. General Practitioner had a medical practice for several years, before accessing a specialty.
2. The socialization of Medicine.
3. Disinterest in the teaching of humanistic values in medical schools, with emphasis on the subject of the doctor-patient relationship, as well as the decrease of teachers who embody these values in their lives.
4. The increase in medical knowledge that has made the development of specialties imperative.
5. Technological development with new equipment and diagnostic techniques.
6. Doctors with lack of vocation and without human training.

This dehumanization in medical practice, has contributed to the current crisis of credibility and distrust in the doctor, and that he sees the patient not as a person, but as an object easy to manipulate and a source of wealth.

#### BASIC PRINCIPLES OF THE DOCTOR-PATIENT RELATIONSHIP

The fundamental ethical standards of Medicine are:

- The principle of Beneficence, from Latin bene = good, facere = make, which is the fifth essence of medical acts, refers to diagnosis and treatment.



- Principle of benevolence (bene=good, and volere= want). Benevolence predisposes the doctor to not only make an objectively valid diagnosis, but also a personalized goal, since each patient receives his or her disease in such a peculiar way that this also has prognostic implications. (Ayala: 1996)

Benevolence predisposes the patient to collaborate with the doctor, trusting in what he proposes to do to reach a diagnosis. This collaboration and trust is so important that without them sometimes you cannot move forward in this phase.

The principle of affability which etymologically comes from the Latin *ad fare* that means to speak to, term that we mistakenly take as synonymous of kind. Surveys complained of great frustration because the doctors did not let them speak, they did not allow them to tell their ailments, they were constantly interrupted and did not get answers to their questions. (Goik 1995)

In geriatrics, affability becomes relevant because communication and information is also one of the basic instruments of palliative care therapy. To communicate is to transmit to another something that one has: information. The objective of the communication is to inform, guide and support the patient and the family so that they have elements to participate in decision making. This should be a dynamic process that adapts to the inflection points of the disease, reviewing the information and the perception of health or illness with the patient and their family, thus advancing in communication for the preparation to deterioration, dependence and even death itself." (Amblás: 2006)

Let's not forget the principle of the Veracity, virtue that must be learned to dose; and the principle of prudence, which teaches how to apply truthfulness (Goik 1995). The principles of Veracity and Prudence are qualities that the Doctor must possess, since

"The ability to communicate bad news effectively is an essential quality for doctors. A systematic approach can strengthen collaboration between doctor, patient and family, offering the possibility of setting realistic goals, planning for the future and supporting each other." (Ayala: 1996)

Some Principles contained in the Law for Elderly are:

- I. Autonomy and self-realization. All actions that are carried out for the benefit of the elderly oriented to strengthen their independence, their capacity for decision and their personal and community development;

- II. Participation. The insertion of elderly in all areas of public life. In the areas of their interest they will be consulted and taken into account; their presence and intervention will also be promoted;
- III. Equity. It is the fair and proportional treatment in the conditions of access and enjoyment of the satisfactions necessary for the welfare of the elderly, without distinction by sex, economic situation, ethnic identity, phenotype, creed, religion or any other circumstance;
- IV. Stewardship The concurrence and shared responsibility of the public and social sectors, especially of the communities and families, for the achievement of the object of this Law, and
- V. Preferential attention. It is the one that requires federal, state and municipal government institutions, as well as the social and private sectors to implement programs according to the different stages, characteristics and circumstances of older adults.

Principles contained in the Human Rights of the Elderly that are refined and amalgamated in the process known as doctor-patient:

- Autonomy
- Participation
- Integrity
- Individuality
- Social inclusion
- Independence
- Continuity attention (Durán: 2012)

The doctor-patient relationship is the doorway to the completion of the clinical history and the most important opportunity that the clinician has to truly know the suffering of his patient, because initially he is the only one who knows what he feels (symptoms) , although the patient is not able to express it in a technical language that leads directly to the sign that the doctor will later identify and correlate with some mental/body functioning disorder and some alteration in the molecular or macroscopic structure of the internal organs. (Goic: 1995)

It is essential that in the establishment of the doctor-patient relationship there is a real connection between the two interacting characters, where both influence each other, without forgetting that they are at the mercy of an infinity of factors as mentioned by Dr. Alejandro Goic G. When pointing:

"The DPR is modulated by social and cultural factors and occurs in an intellectual and technical level but also affective and ethical. Social and cultural factors

influence the consultation of a particular doctor in the DPR scenario and therapeutic decisions. Impersonality in treatment, the attitude of judge and the petulance of the doctor negatively affect the DPR. The doctor should strive to create positive feelings in the DPR, which favors the diagnosis and treatment." (Goic: 1995)

Every sick person is an anguished being; it corresponds and it is the duty of the health professional to relieve their anguish and avoid at all costs to increase it. The doctor is obliged to recognize and manage his own emotions, in addition to abiding by the first ethical obligation, as it is, to have updated knowledge.

The doctor and primarily the specialist in geriatrics, should consider that all clinical decisions should be adopted, not only for technical reasons but also ethical. A bad Doctor-Patient Relationship leaves sequels that influence all the actors of the DPR and in the course of the disease, particularly when the relationship between the elderly and the caregiver is not adequate.

The anthropological and ethical training of the doctor and the mastery of semiological skills, not replaceable for technology, are decisive for the exercise of a human, technical, ethical and socially effective medicine. (Goic: 1995)

Clinical medicine includes everything that puts the doctor in contact with the individual reality of the patient and that allows him to diagnose and treat his patient. This procedure is done through the information he collects with his intelligence and senses and those provided by auxiliary diagnostic methods. The Doctor-Patient Relationship (DPR) is a decisive element in the practice of clinical medicine.

Ultimately, the diagnostic activity of the doctor and the success of his therapeutic action are consumed in the encounter with his patient. It is true that the relationship is not exclusive with him; it is, also, with the patient's family (López: 2010), with his relatives or friends. In the doctor-patient relationship, the caregiver or the family acquires, on occasions, a special relevance, as in the case of children's medicine, in the geriatric patient (López: 2010) and in the patient committed to conscience. However, in these situations, the relationship with others is generated according to the interpersonal relationship with the patient; the relationship would not exist if it were not because that person required the help of the doctor. (Goic: 1995)

Once the patient is recognized as the center of attention, the effect of the contextual variables, the theoretical perspective of health institutions, the orientation of the service providers, the culture and traditions of the patients, formally consider four approaches to establish the model of human communication in the doctor-patient relationship:

- The medical interview
- The psychological interview
- The psychiatric interview
- The anthropological interview

In the **medical interview** the predominant approach is the clinical biomedical. Its approach is operative, according to the patient's health problem, with emphasis on symptoms and iatrotropic signs characteristic of organic and functional damage, systematizing the findings by organs systems (Goic: 1995). Therefore, some Recommendations are suggested:

- A. Uses of empathy initiating a look of affection and some physical contact such as shaking hands when greeting and some friendly words of welcome;
- B. Context suitable for the interview, comfortable environment in its temperature, isolation, noise, lighting.
- C. Location of the interviewer (doctor, therapist) and the interviewee (patient): it is not advisable that there are barriers (desk) between them and neither an annoying insistence voice or a glare during the interrogation, although it is beneficial that from the beginning they establish some kind of alliance to face together the hostile or threatening outside world.
- D. Confidentiality, given that it is a fundamental principle of patient's rights. They have the right to have their privacy respected and to talk privately with the doctor (Goic: 1995).

Once the patient's confidence has been gained, the doctor must pay attention to his voice, the most valuable tool he has in his therapeutic arsenal. Plain and simple language helps clarify the message (symptoms) and deepen the psychological sphere.

Some specific recommendations to capitalize the interview are: attention to behaviors (eye contact, body posture, verbal continuity), use of questions (open, exploratory and closed), use of minimal stimuli that show interest in the patient (brief expressions of admiration or interrogatives), closing certain points with paraphrasing, especially to resolve situations of dilemma

and explain some unclear aspects. Finally, summarize the topic under discussion and promote reflection on feelings.

In the case of difficult patients, "Some experts have proposed five useful strategies to address these patients, which are briefly described: Reflection, legitimization, support, accompaniment and respect." (López: 2010) of which the guiding principles of human rights are described.

It is at this point that we must demonstrate the existence of supra and subordination in the doctor patient relationship and that this relationship does not violate the principles nor the rights protected by the inter-American commission of human rights, nor by the international organization of Human Rights, criteria that we will describe and evaluate later.

Regarding the **psychological interview**, one should not forget the anatomophysiological substratum of the disease, with this approach the doctor tries to perceive and understand his patient in his physical and mental totality (Goic: 1995).

Interrogation and physical examination retain their diagnostic value, but acquire the therapeutic virtues of an affective bond by exploring the needs and expectations of the patient.

"The knowledge of the personal history of the patient, particularly that oriented to lifestyles, family dynamics, social relations, job satisfaction, tensions and inter/intrapersonal conflicts is of great importance to identify symptoms of psychic tension, discover the existence of emotional disorders, stressful situations, character traits and their personal way of reacting, elaborating or sublimating the symptoms of emotional conflict". (García: 1999)

For the adequate compilation of signs and symptoms, the doctor should sharpen his senses, develop their capacity for listening and observation and be intuitive while listening and observing the Verbal, nonverbal communication and the emotional language of the patient, to simultaneously identify the physical symptoms and the subjective symptoms of great emotional charge, which translate into disorders that are often repressed, as a result of intra and interpersonal relationships.

"Symptoms of psychic tension are often apparent in the external habitus: cold or bright eyes, depressed countenance, cold diaphoresis, digital/palmar tremor, restlessness, abnormal movements, tics and myoclonus. On other occasions,

subjective symptoms predominate: anxiety, depression, fear, panic, apathy, asthenia, and handicap". (García: 1999)

This type of approach is considered low in the university's preparation of the doctor and as a result of the lack of this knowledge, the professional uses a mask of authoritarianism imposing his will on the patient's obstructing in the relationship and adherence to the prescribed treatment, in my concept of defining this attitude as **Supraordination**, the rejection of this position arises and the stigmatization of the philosophers of medicine begins.

The **psychiatric interview** is characterized by the meeting of two people, one of them recognized as an expert in interpersonal relationships (psychotherapist, psychiatrist, psychoanalyst) and the other known as client (interviewed, patient), who hopes to extract some benefit from a serious discussion with the expert on their needs in the case at hand, in health matters.

This approach is fundamental to a human communication model that links the individual in his process of self-awareness/reflection, linking it through his thoughts and through language, with the inter-subjectivity of his peers, in a specific sociocultural context (Goic: 1995).

The **anthropological interview** contains the previous ones but goes beyond the simple doctor-patient relationship when the psychophysical manifestations of the phenomena emanating from intra- and interpersonal interaction are identified in detail, and their effect on the health status of the interacting individuals.

The participation of the doctor-patient binomial in the alternation of their roles during communication and their effect on emotional and organic health is clear; in the same way, the role played by intervening variables in an extended context, that is, the full burden of historical, political, economic, religious and cultural phenomena, is clearer. In technical language, the intervening variables of the context are known in the health-disease process as risk factors and potential health factors.

The manifestations of the systems have as their vehicle the oral language. They are no longer considered only in a literal or semiotic sense, because under them there is a whole load of affectivity and meanings.

This model of interview where we analyze the individual globally by effectively including the social context, we can say that only then we will be addressing the patient in the bio-psychosocial spheres. Resulting in:

- Better understanding of the disease health process through looking at the doctor-patient relationship.
- Clearly human focus by emphasizing the psychological, social and cultural aspects of the interviewee, without forgetting their biological substrate.
- Privilege of language as a vehicle of the signifier (symptom-sign) in the manifestation, identification, understanding and interpretation of the disease (meaning).
- Deliberate and proactive use of the word as the most powerful intra and interpersonal communication tool.
- Maximum use of the therapeutic effect of the word *per se*

The anthropological interview, because it is a global technique, must be strictly applied in the geriatric patient, because the evaluation of this, not only tests knowledge and skills, but also evaluates the ability of concentration, tolerance and patience of the doctor and of the health team, due to the fact that they are multipatologic patients, polypharmacies and an increasing number of unmet needs (Morales: 2000).

The Doctor-Patient relationship in geriatrics "is distinguished from other medical evaluations by two basic aspects: the importance of the coordinated work of a multidisciplinary team and the time that must be invested to carry it out." (Morales: 2000)

Having walked through the most relevant aspects of the patient-physician relationship, we can go into the explanation of why, in order to ensure a good doctor-patient relationship, it is necessary to have the relationship of Supra-ordination and Subordination.

Before entering the field of the subject we must clarify the concepts of Supraordination, Subordination and Isordination.

**Subordination:** It refers to the dependency relationship that exists between one element with another and is determined by the suffix sub meaning low. It is correct to assume that in the doctor-patient relationship, it is the patient or health seeker who presents this state of need, so when going to the doctor a consensual and written contract is established when there is an informed consent letter.

This unique contract for professional services can occur in two areas, such as the private sector and the Institutional one. Due to this duality, the doctor-patient relationship should theoretically be analyzed in two ways, based on the scope of attention and of which we will see its legal aspects, but we must not forget that above the areas of work performance is the human and psychological aspect.

Meanwhile we will continue analyzing the problem, for this we have to point out that it is the supraordination, which is a term of legal use in administrative matters, where the governing body works under the rule of the executive power and serves the common citizen, which is Supraordination:

**Supraordination:** Is the person or entity placed in a plane of superiority in relation to another placed in a plane of dependence or hierarchical inferiority.

When it is pointed out that in Mexico the patient-physician relationship occurs in two areas, the private and the public, I can assure that when this relationship arises in the public sphere there is a misunderstood relationship of supraordination because the doctor works under the protection of the Public Institution.

#### THE RELATIONSHIP OF SUPRA TO SUBORDINATION

This relationship rests on the subjective quantitative duality, that is, it arises between two entities placed in a different position plane; that is, between the State as a juridical person, politics, and its organs of authority, on the one hand, and that governed by the other. In the medical field, it is the institution as part of the State and the patient as the other.

It is precisely this type of relationship that gives rise to the need to safeguard individual guarantees (article 4 of the Constitution on health) and human rights in general and for the elderly.

The relations of supra to subordination are those that exist or are created between state bodies, on the one hand, as depositaries of the power of empire and the subjects against whom the power is exercised through various acts of authority of diverse nature, on the other.

In these relations, the state moral person and his authorities play, in front of the governed, the sovereign or government activity, which results in the realization of authoritarian acts themselves that have as characteristic attributes the one-sidedness, imperativeness and coercively. These last



terms should not be unknown to us because we have seen them in our daily clinical practice.

While in the private sphere, there is a duplicity of needs in this relationship, consisting of the patient's need for health and the need for financial rewards and publicity from the doctor. Situation that the jurists have denominated as relation of Isoordination and that we will see next.

**Isoordination:** It is an intellectual operation of conceptual thinking; it is a particular relation of two classic concepts: The Isoordinated and the Isoordinate, the former being that characteristic that defines the latter; the last one is the one that wants to define.

However, as the definition itself points out, it is an intellectual operation, because on the real plane the Isoordinated (Patient) and the Isoordinate (Doctor), there is still a relationship of need and dependence.

So it is concluded that in the doctor-patient relationship there is a material relationship of supraordination and subordination according to the area where this medical act is performed.

But for real and current purposes, we must understand that in the relationship of the patient and doctor to rely on a state of need there will always be a psychological dependence on the part of the patient and the obligation of the doctor to maintain this distinction in a respectful and empathy for the moment the patient lives.

## FINAL THOUGHTS

In the text it is observed that the cornerstone in medical care and in particular the care of the geriatric patient is the doctor-patient relationship.

To achieve excellence, this should not be based on technical-medical knowledge, the use of technology and constant training. But it should be propped up in something simple and economical as it is the doctor-patient relationship that focuses mainly on the interview, and specifically in the anthropological interview since it encompasses the patient in its Bio-Psycho-Social-Cultural and sexual spheres of all patient.

The above is indicated, because the elderly belongs to a group of exponential growth thanks to the medical advances that influence the changes described in the demographic and epidemiological transition phenomena.

In the Doctor-patient Relationship there will always be a state of need, in which the patient wants to improve his health and for this reason he must submit his will in a respectful relationship with his treating doctor. Because supraordination must only exist within the psychological plane, not in the material relationship of the patient's treatment, where there must be treatment from human to human, man to man and equal to equal.

It is precisely in this relationship of respect, trust and an extra element called empathy, where the subordination is born to be able to accept the diagnosis and the therapy proposed by the doctor who is placed by the same patient in a plane of supraordination, but that must be based on empathy, where this can, through emotional intelligence techniques achieve psychological and emotional attunement (Raport) with the patient, transmitting interest in the satisfaction of their need.

Supraordination, has been misunderstood by some of the health professionals, who have used this element as a mask to justify an inadequate medical practice.

The relationship of Supraordination and subordination of the doctor-patient relationship, for being founded on the principles of empathy, solidarity, honesty, affability, veracity, beneficence does not violate the patient's human rights.

The doctor-patient relationship must be carried out in psychological and emotional harmony, where empathy plays an important role and in the case of the elderly patient it must be seasoned with great patience.

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