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Complementarity analysis of the Priority Areas Development Program and the Priority Attention Areas Program in the National Crusade Against Hunger Program in indigenous municipalities in the State of Veracruz Mexico

Análisis de complementariedad del Programa de Desarrollo de Zonas Prioritarias y del Programa de Zonas de Atención Prioritaria en el Programa Cruzada Nacional contra el Hambre en municipios indígenas en el Estado de Veracruz México

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Abstract

Mexico, with the commissioning of the "National Crusade Against Hunger Program" in 2013, aimed at serving the population that presents both extreme poverty and food deprivation. The article aims to analyze whether the criterion of the selection of the municipalities of the State of Veracruz incorporated in the National Crusade Against Hunger Program (PNCH) show complementarity with the efforts in the fight against poverty in the social expenditure strategy applied in the Priority Attention Zones Program (ZAP) and the Priority Areas Development Program (PDZP) and, particularly, the indigenous municipalities that have a greater degree of social exclusion. The adjustment of a binary logistic regression model is presented, in order to assess the incidence of contextual factors to interpret the scope of the strategy adopted by the federal government in the fight against poverty and hunger. As a result, it is evident that there is no continuity in the fight against poverty, since the municipalities included in the strategy Priority Areas of Attention and Program of Development of Priority Zones are not considered in the selection of municipalities incorporated in the National Program of Crusade Against Hunger, a situation that identifies the relationship between programs is not complementary.

Social Exclusion, Indigenous Population, National Crusade Against Hunger Program

Resumen

México con la puesta en operación en año 2013 del "Programa Cruzada Nacional contra el Hambre" se buscó atender a la población que presentan tanto pobreza extrema y carencia alimentaria. El artículo se dirige a analizar si el criterio de la selección de los municipios del Estado de Veracruz incorporados en Programa de Cruzada Nacional contra el Hambre (PNCH) muestran complementariedad con los esfuerzos en el combate a la pobreza en la estrategia de gasto social aplicada en el Programa de Zonas de Atención Prioritaria (ZAP) y del Programa de Desarrollo de Zonas Prioritarias (PDZP) y particularmente, los municipios indígenas y que tienen un mayor grado de exclusión social. Se presenta el ajuste de un modelo de regresión logística binaria, con el fin de valorar la incidencia de los factores contextuales para interpretar el alcance de la estrategia adoptada por el gobierno federal en el combate a la pobreza y el hambre. Como resultado es evidente que no existe continuidad en la lucha contra la pobreza, ya que los municipios incorporados en la estrategia Áreas Prioritarias de Atención y Programa de Desarrollo de Zonas Prioritarias no son considerados en la selección de municipios incorporados en el Programa Nacional de Cruzada Contra el Hambre, situación que identifica la relación entre los programas no es complementaria.

Exclusión Social, Población Indígena, Programa Cruzada Nacional Contra El Hambre

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Introduction

The fight against poverty is a current concerns, its study is addressed from various theoretical and methodological approaches. Thus, in the United Nations document "Millennium Development Goals" signed in New York in 2000, it was established, as a very ambitious goal, to reduce by half the world's poverty by 2015. The World Bank also has directed its policy in order to seek a solution to poverty, from a macroeconomic perspective, through actions that allow countries to alleviate the debt burden, and with it, achieve economic stabilization. Recently, the Resolution adopted by the General Assembly of the United Nations on September 25, 2015 "Transforming our world: the 2030 Agenda for Sustainable Development" establishes, among others, the following paramount: "Objective 1.To put end poverty in all its forms and all over the world" and "Objective 2.

End hunger, achieve food security and improve nutrition and promote sustainable agriculture". It should be noted that recent studies have shown that the indigenous population has been subject to social exclusion, a situation that exacerbates their multidimensional poverty level (Medel, 2106), as well as making it difficult for them to access a formal laboral market, have health services, education and housing. In this sense (Tetreault, 2012, Rionda, 2010, Barba, 2009, Del Popolo et al., 2009, World Bank, 2004, Appasamy et al., 2003) point out that the indigenous population is subject to social exclusion due to factors such as: (i) their ethnic status; (ii) its gender; and (iii) its condition of multidimensional poverty. It is recognized as lacerating, from the point of view of social justice, the existence of conditions of marginalization and social backwardness that occurs in the indigenous population, to which they are conferred, for this fact alone, to be subjects of social exclusion.

The present article seeks to answer if, the criterion of the selection of the municipalities of the State of Veracruz incorporated in PHASE 2 the National Crusade Against Hunger Program (PNCH) shows complementarity with the efforts in the fight against poverty in the spending strategy applied in the Priority Attention Zones Program (ZAP) and the Priority Areas Development Program (PDZP) and, particularly, in the indigenous municipalities that present a greater degree of social exclusion.

To this end, a binary logistic regression model was adjusted in order to assess the incidence of contextual factors to interpret the scope of the strategy adopted by the federal government in the fight against poverty.

Theoretical framework

Multidimensional poverty

Poverty is a subject that has been widely studied; however, the study from a multidimensional approach is relatively new. In (Sen, 2000) poverty is conceived as the deprivation of basic capacities and not only in terms of low incomes. In the logic proposed by Sen (Boltvinik, 2013), poverty is defined as a phenomenon of multidimensional study and (Alkire-Foster, 2007) propose a methodology that identifies the poverty line and the deprivation line in the persons identified as poor.

Currently in Mexico, the strategy for combating poverty, according to social development policy, states that improving the provision of basic social infrastructure will break the cycle of poverty. In other words, in order to reduce regional disparities and reduce poverty levels, the aim is to improve the basic social infrastructure: water, drainage, electricity, basic services (education and health) and the improvement of housing conditions. .

The measurement of improvement under these conditions is measured through the marginalization index and the social lag index, however, it does not consider aspects that generate social exclusion and multidimensional poverty.

The following Graph 1 presents the theoretical, conceptual and referential framework that is used in the present study for the study of poverty, where it is proposed as a way of explaining multidimensional poverty (Alkire-Foster, 2008), the focus of the social exclusion (Rawls, 1995) and the deprivation of capabilities approach (Sen, 2000).

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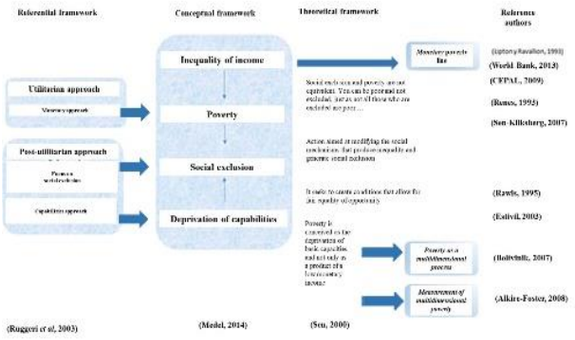


Graphic 1 Theoretical, conceptual and referential framework that is used in the present study for the study of poverty

Source. Own elaboration. Adapted from Medel Ramírez, Carlos (2016), Evaluation of the degree of social exclusion and multidimensional poverty in the indigenous communities in the State of Veracruz: The case of the development program of priority areas. (Doctoral thesis). Economy faculty. Doctorate in Public Finance. Universidad Veracruzana.

With Sen (2000) poverty is conceived as the deprivation of basic capacities and not only as a low income. In this logic proposed by Sen, Boltvinik (2013) defines poverty as a multidimensional process in which the well-being of households and people depends on six sources: current income; the non-basic assets and the indebtedness capacity of the household; family assets; access to free goods and services; free time and available for domestic work, education and rest and knowledge of people.

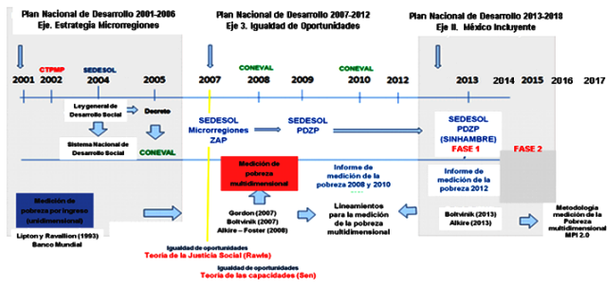
Alkire-Foster (2008) present a methodology that identifies two cuts, the first identified with the poverty line and the second with the deprivations identified in the people in poverty. This identification allows the targeting of the target population in the strategy to combat poverty. The following section presents the contributions of Sen, Alkire-Foster, and Gordon-CONEVAL, which constitute the basis of the theoretical foundation for the study of multidimensional poverty in Mexico."

Graphic 2, below, presents the evolution of the approach of social policy for the study and fight against poverty in Mexico.

It is emphasized that since 2004, with the promulgation of the General Law of Social Development and the creation of the National Social Development System, the creation, in 2005, of CONEVAL has been sustained. Based on the theoretical contributions of (Gordon, 2007), (Boltvinik, 2007) and (Alkire-Foster, 2008).

The CONEVAL proposes a measurement of poverty from a multidimensional approach, dictating in 2010 the methodological guidelines for the measurement of poverty. In Mexico, responsibility for determining the methodological criteria for the measurement of multidimensional poverty, by mandate of law, rests with the Ministry of Social Development (SEDESOL) and with the support of the National Council for the Evaluation of Social Development Policy (CONEVAL) issues the "Guidelines and general criteria for the definition, identification and measurement of poverty" establishing the technical and legal criteria that define multidimensional poverty, and which is incorporated in the Law of Social Development, and which defines:

Definition 1. "The population in a situation of multidimensional poverty will be one whose income is insufficient to acquire the goods and services required to satisfy their needs and is lacking in at least one of the following six indicators: educational lag, access to services of health, access to social security, quality and housing spaces, basic services in housing and access to food." [1]



Graphic 2 Evolution of the focus of social policy based on the measurement of multidimensional poverty and the National Anti-Hunger Program in Mexico, 2001 – 2017.

Source. Own elaboration. Adapted from Medel Ramírez, Carlos (2016), Op. cit.

[1] In 2010, 52 million people are living in poverty, of which 40.3 million correspond to a situation of moderate poverty and 11.7 million to extreme poverty. On the other hand, 84.3 million people have at least one social deprivation and 29.9 have at least three social deprivations, 23.2 million people shw educational backwardness, 35.8 million have a lack of health services, 68.3 million have a lack of access to social security , 17.1 million have a lack of quality and spaces in housing, 18.5 have a lack of access to basic services in housing and 28.0 million show lack of access to food. It is also noted that 21.8 million people are located with an income below the minimum welfare line and 58.5 million have an income below the welfare line. See CONEVAL Poverty report at the municipality level 2010. Retrieved from: http://www.coneval.org.mx/Informes/Pobreza/Pobreza_municipal/pobreza%20extrema%20y%20alimentacion%20por%20municipio.zip

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It should be noted that the evolution of the approach to social policy, are recognized and incorporate the theoretical and conceptual contributions of the Theory of Justice by Rawls.[2] and Sen's Theory of Capacities.[3] In this article, our proposal is to incorporate the index of social exclusion, as an explanatory element of the multidimensional poverty condition in the indigenous population of the State of Veracruz (Medel, 2016), as well as to analyze the scope of the social policy of combating poverty through the National Crusade Against Hunger Program (PNCH).

And complementarily with efforts to combat poverty in the social expenditure strategy applied in the Priority Attention Zones Program (ZAP) and the Development Program of Priority Zones (PDZP).

Social Exclusion

As a social phenomenon in which multiple factors are related, is approached from different approaches (Klanfer, 1965, Donzelot, 1992, Renes, 1993, Castel, 1995, Gazier, 1996, Appasamy et al. , 1996, Barry, 1998, Tezanos, 1999, Sen, 2000, Cabrera, 2002, Estivill, 2003, Sen, 2003, Uquillas et al., 2003, Subirats et al., 2004, World Bank, 2004, Raya, 2006; Laparra et al., 2007; Hickey, 2007; Sen-Kliksberg, 2007; Del Popolo et al., 2009; Rionda, 2010 and Tetreault, 2012). The concept of social exclusion has to do with the process through individuals or groups totally or partially excluded from the society in which they live. This category does not only refer exclusively to the lack of employment.

With (Donzelot, 1992, Renes, 1993, Castel, 1995) and (Gazier, 1996) recognizes that social exclusion its central paradigm of scarcity, leads him to raise the issue in terms of poverty / wealth, equality / inequality in the possession and use of produced goods. Meanwhile (Barry, 1998) indicates that there is an association between the dispersion of income and exclusion and that public policy can make a difference between the degrees of inequality that manifests itself in social exclusion.

In (Sen-Kliksberg, 2007) considers that the number of deficiencies or deprivations is not entirely limited to the material or economic, but can be extended to other dimensions that limit the capabilities of people to lead a full, dignified life and a society decent living, what are called social exclusion. Meanwhile, we agree (Hickey, 2007) in the sense that it must analyze the phenomenon of social exclusion, from the perspective of class, ethnic origin and gender, a situation that generates a multidimensional analysis, the study of poverty. (Subirats *et al*., 2004) proposes the following definition:

Definition 2. "Social exclusion is the result of a specific situation process of dynamic accumulation, overlap and / or combination of various factors of disadvantage or social vulnerability that can affect people or groups, creating a situation of impossibility or intense difficulty access to the mechanisms of personal development, community social inclusion and systems of protection."

Although within the country there are greater conditions of marginalization in the indigenous population[4] that in the non-indigenous, within the indigenous groups there are different levels of marginalization, which identify different degrees of social exclusion. The problem to solve is how to reduce the levels of marginalization and social exclusion in the indigenous population.

Strategy and the determination of the target population and the National Crusade Against Hunger Program (PNCH)

In the social policy of combating poverty, federal public resources are allocated through the targeting criterion for the attention of a target population. As a strategy for the allocation of resources, priority areas for attention (ZAP) were identified in 2007 and subsequently the criterion was modified in 2009 in the Priority Areas Development Program (PDZP), which is currently used. (See Figure 1, presented earlier).

[2] See John Rawls 1971. The theory of Justice. The Belknap Press of Harvard University Press, Cambridge, Mass. Retrieved from: https://etikhe.files.wordpress.com/2013/08/john_rawls_-_teoria_de_la_justicia.pdf

[3] See Sen Amartya. (1976): "Poverty: an ordinal approach to measurement". Econometrica, 44, pp. 219-213

[4] The municipalities with indigenous population refer to the municipalities in which the population that speaks the indigenous language are registered, and that do not speak Spanish. This information is described in the records of the 2010 Population and Housing Census.

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a. **Priority Attention Areas.** In November 2006, CONEVAL presented the criteria for the determination of Priority Attention Zones (ZAP). This methodology allowed defining the areas of attention for the targeting of federal public resources, as well as defining the target population in the operation of social development programs. The Priority Attention Areas (ZAP) approach worked from 2007 to 2008 and was subsequently modified in the Priority Areas Development Program (PDZP) in 2009, currently in operation. In both targeting criteria, factors such as: i) indigenous presence are recognized[5] and ii) level of marginalization, as criteria in the selection of the target population, in the incorporation of social development programs, in accordance with the standards and applicable legislation in the matter.

b. **Priority Areas Development Program**. In accordance with the operation rules, the objectives of the (PDZP)[6] they are basically three:

1. To increase the quality of life in areas of priority attention through the rehabilitation and expansion of the basic social infrastructure and the improvement of housing.

2. Contribute to the reduction of regional inequalities in localities and municipalities of high and very high marginalization, with social backwardness or with a strong concentration of poverty.

3. Contribute to the actions aimed at the municipalities considered in the 100x100 Strategy, which aims to provide comprehensive care for the 125 municipalities with the greatest marginalization and poverty in the country, under inter-institutional coordination schemes and the three levels of government.

The Program for the Development of Priority Areas (PDZP) operates in the 32 states and mainly in the territories defined as Priority Attention Areas (ZAP), according to the following criteria:

1. In high and very high marginalization municipalities that are part of the (ZAP). In predominantly indigenous municipalities, according to CONAPO, regardless of their degree of marginalization Source.

2. In strategic locations for the development of the regions established in the ZAP declaration, and their areas of influence.

3. In localities of high and very high marginalization, located in municipalities of medium, low and very low marginalization, provided that it does not duplicate with the activities of the Habitat program. And support for housing can be given regardless of the territorial criteria provided that the inhabitants of the houses present conditions of poverty, backwardness or marginalization

[5] The indigenous regions correspond to the CDI catalog. In 2010, the State of Veracruz registered an indigenous population of 969,439 people, whose regional distribution is as follows: 66.51% correspond to municipalities that do not belong to an indigenous region, while municipalities that identify with an indigenous region represent 33.49 % of total municipalities. Of the municipalities that identify with an indigenous region, we have the following:

— The Cuicatlán, Mazateca, Tehuacán and Zongolica regions are integrated by 23 municipalities and represent 10.85% of the municipalities at the state level. According to the characteristic of the indigenous region, it is noteworthy that 17 are indigenous municipalities, 5 are municipalities with indigenous presence and only 1 municipality has scattered indigenous presence. In this region, an indigenous population of 198,914 people was registered.

— The Huasteca region encompasses 17 municipalities and represents 8.02% of the municipalities at the state level. It is composed of 15 indigenous municipalities and 2 municipalities with indigenous presence. In this region an indigenous population of 284,148 people was registered.

— The Tuxtlas, Popoluca-Nahuatl region of Veracruz concentrates 14 municipalities and represents 6.60% of the municipalities at the state level. It is integrated by 6 indigenous municipalities, 6 municipalities with indigenous presence and 2 municipalities that have scattered indigenous presence. In this region, an indigenous population of 140,861 people was registered.

— The Sierra Norte de Puebla and Totonacapan region concentrates 14 municipalities and represents 6.60% of the municipalities at the state level. It is composed of 9 indigenous municipalities and 5 municipalities with indigenous presence. In this region an indigenous population of 196,705 people was registered.

— And finally, the Chinanteca region which concentrates 3 municipalities and represents only 1.42% of the municipalities at the state level. It is composed of 2 indigenous municipalities and 1 municipality with an indigenous presence. In this region an indigenous population of 26,878 people was registered.

See National Commission for the Development of Indigenous Peoples (CDI). 2006. Indigenous regions of Mexico. Retrieved from: http://www.cdi.gob.mx/regiones/regiones_indigenas_cdi.pdf

[6] See AGREEMENT whereby the Operating Rules of the Program for the Development of Priority Areas are issued for the fiscal year 2013. (Mexico, Ministry of Social Development, SEDESOL). Mexico DF.

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c. **National Crusade Against Hunger Program (PNCH).** a) Operation PHASE 1. - In this phase of operation, the National Crusade Against Hunger Program (PNCH) [7] (PNCH) began with the attention of 400 municipalities nationwide in which extreme poverty and food deprivation are present, with a potential population to be served estimated at 57,776,808 million people. At the operational level, this generated 70 federal programs coordinated by SEDESOL to meet the following objectives:

1. "Zero hunger from adequate food and nutrition of people in extreme multidimensional poverty and lack of access to food;

2. Eliminate acute infant malnutrition and improve the weight and height indicators of childhood;

3. Increase food production and income of peasants and small agricultural producers;

4. Minimize post-harvest and food losses during storage, transportation, distribution and commercialization, and Promote community participation for the eradication of hunger. "

It highlights the attention of the states of Chiapas, Guerrero and Oaxaca who concentrate 234 municipalities of the 400 municipalities included in the PNCH program in its PHASE 1, thats is they represent 58.50% of the total of the municipalities served within this program. At the state level, the State of Veracruz in PHASE 1 of the PNCH were selected 33 municipalities, of which 14 are identified as indigenous municipalities, 11 correspond to municipalities with an indigenous population presence and 8 are municipalities with scattered indigenous population.

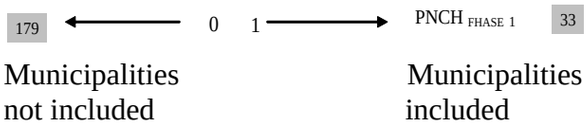
b) Operation PHASE 2 .- In 2014, in its PHASE 2 of operation the PNCH 612 municipalities are served more in order to reach 5.5 million people in extreme food poverty that represent 78.4 percent of the target population[8] by what total 1,012 municipalities in total.

In PHASE 2 of the PNCH at the state level, 52 municipalities are incorporated into the 33 initial municipalities, making a total of 85 municipalities in the PNCH in this phase of operation. Of the 85 selected municipalities, 37 are identified as indigenous municipalities, 18 are municipalities with an indigenous population, and 30 are municipalities with scattered indigenous populations. PNCH PHASE 1 are 33 municipalities that were included in the PNCH Program. Be PNCH PHASE 1 the first phase of operation of the PNCH in which 33 municipalities of the State of Veracruz were included.

Where:

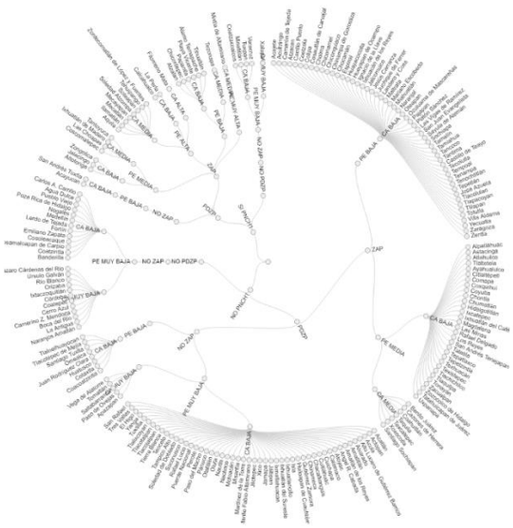
— The value of 1 is assigned to the municipalities that are included in the PNCH PHASE 1 and
— The value of 0 to municipalities that are not included in the PNCH PHASE 1.

Dichotomous value



And where:

Selection criteria for the municipality within the PNCH is: PE High extreme poverty and CAA Food shortage. (See Graphic 3 below)



Graphic 3 Municipalities of the State of Veracruz included in the National Program Against Hunger in PHASE 1 according to incorporation to the Priority Zone Development Program, Priority Attention Area, Extreme Poverty Degree and Degree of Food Deficiency. 2013
Source: Own elaboration with information from SEDESOL.

[7] See DECREE. National System for the Crusade against Hunger. (January 22, 2013. DOF.) Agreement by which the operation rules of the food support program are issued, for fiscal year 2013. (February 26, 2013).

[8] See SEDESOL. National Crusade against Hunger. Recovered from: https://www.gob.mx/sedesol/documentos/cruzada-nacional-objetivos

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It is estimated that the indigenous population likely to be served by the PNCH PHASE 1 corresponds to 518,912 people, which represents 53.53% of the total indigenous population in the State of Veracruz. It is important to highlight the orientation in the selection criteria for indigenous municipalities, since 63.64% corresponded to municipalities that correspond to an indigenous region and only 36.36% corresponded to municipalities that do not belong to an indigenous region. See Table 1 below.

INDIGENOUS REGION 1	Not included	Include 2
Chinanteca	2	1
Cuicatlán, Mazateca, Tehuacán y Zongolica	18	5
Huasteca	11	6
Sierra Norte de Puebla y Totonacapan	10	4
Tuxtlas, Popoluca-Náhuatl de Veracruz	9	5
Municipalities that do not belong to an indigenous region	129	12
TOTAL	179	33

Table 1 State of Veracruz by Ignacio de la Llave. Number of municipalities according to inclusion in the PNCH PHASE 1 and indigenous region. 2013
Source. Own elaboration with information from CDI[1] and SEDESOL[2]

In Phase 2, 85 municipalities were included in the PNCH Program. Be PNCH PHASE 2 the second phase of operation of the PNCH in which 33 municipalities of the State of Veracruz were included.

Where:

— The value of 1 is assigned to the municipalities that are included in the PNCH PHASE 2 and
— The value of 0 to the municipalities that are not included in the PNCH PHASE 2,

Dichotomous value

127 ← 0 1 → PNCH PHASE 2 85

Municipalities not included

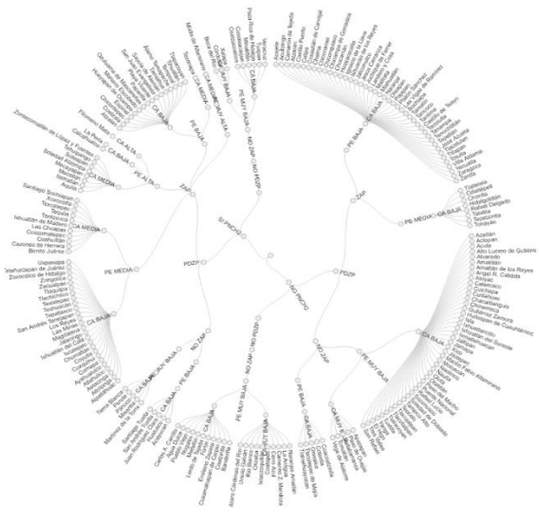
Municipalities included

And where:

Selection criteria for the municipality within the PNCH is: PE=High extreme poverty and CAA= Food shortage. Of the municipalities that are incorporated in the PNCH PHASE 2, 23 identify as indigenous municipalities[9], 7 are municipalities with indigenous presence[10] and 22 are municipalities with scattered indigenous population. As regards its distribution according to the indigenous region, this information is presented in Table 2 and Graph 4, below.

INDIGENOUS REGION 1	PNCH 2 PHASE 1	PNCH 2 PHASE 2
Chinanteca	1	2
Cuicatlán, Mazateca, Tehuacán y Zongolica	5	15
Huasteca	6	11
Sierra Norte de Puebla y Totonacapan	4	12
Tuxtlas, Popoluca-Náhuatl de Veracruz	5	10
Municipalities that do not belong to an indigenous region	12	35
TOTAL	33	85

Table 1 State of Veracruz by Ignacio de la Llave. Number of municipalities incorporated in the PNCH, according to the operation phase and indigenous region. *Source. Own elaboration with information from CDI[1] and SEDESOL[2]*



Graphic 4 Municipalities of the State of Veracruz included in the National Program Against Hunger in PHASE 2 according to incorporation into Priority Zone Development Program, Priority Attention Area, Degree of Extreme Poverty and Degree of Food Deficiency, 2014.
Source: Own elaboration with information from SEDESOL.

[9] According to the information provided by the CDI, it is estimated that of the 23 municipalities that are incorporated in PHASE 2 of the PNCH and that are identified to indigenous municipalities, and in accordance with the index of ethnolinguistic replacement (indicator that measures the condition of that the new generations of the population of an ethnolinguistic group maintain the use of the indigenous language) has 1 municipality shows a degree of ethnolinguistic replacement that qualifies it as an accelerated extinction, 5 municipalities show a degree of ethnolinguistic replacement that qualifies it as a slow extinction , 7 municipalities show a degree of ethnolinguistic replacement that qualifies it as in equilibrium and 10 municipalities show a degree of ethnolinguistic replacement that qualifies it as slow expansion. See Ordorica Manuel, *et al*. The ethnolinguistic replacement index among the indigenous population of Mexico. Desacatos, Journal of Social Anthropology, núm 29, 2009. Retrieved from: http://desacatos.ciesas.edu.mx/index.php/Desacatos/article/view/436/305

[10] It is estimated that of the 7 municipalities that are incorporated in Phase 2 of the PNCH and that are identified to municipalities with indigenous presence, 5 municipalities show a degree of ethnolinguistic replacement that qualifies as accelerated extinction, 1 municipality show a degree of ethnolinguistic replacement that it qualifies as a slow extinction, 1 municipality shows a degree of ethnolinguistic replacement that qualifies it as in equilibrium. . See Ordorica Manuel, *et al*. The ethnolinguistic replacement index among the indigenous population of Mexico. Op. Cit.

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As seen in both PHASE 1 and PHASE 2, the criterion for the selection of the target population is that it presents a high level of extreme poverty, lack of food. Here we must ask ourselves: What is the result of this targeting strategy for the allocation of federal public resources aimed at combating multidimensional poverty and what is the impact on the indigenous speaking population? Is there complementarity in the solution of poverty in the new strategy proposed in the National Crusade Against Hunger Program (PNCH), for the indigenous population that presents high marginalization and social exclusion? To this end, a binary logistic regression model was adjusted in order to assess the incidence of contextual factors to interpret the scope of the strategy adopted by the federal government in the fight against poverty. Our proposal is to incorporate social exclusion as an element to explain the current condition of poverty in indigenous.

Methodology

Definition of the study area.

The study area is the State of Veracruz and corresponds to the 212 municipalities attending the following: Extreme poverty (PE), Food deficiency (CA), Educational lag (RE), Municipal social lag (GRM) , Municipal Marginalization (GMM), Social Exclusion Index (IES) and Income less than the minimum well-being line (PIILBM).

Population of 3 years and more that speaks some indigenous language (PHLI3YMAS), Total current income per capita monthly (ICTPC). The analysis of the municipalities also incorporates the identification and classification according to: the Indigenous Region (REGIND), Type of indigenous municipality (TIPMUNIND) and Degree of ethnolinguistic replacement (GRE). And finally, to the identification or belonging of being a municipality included in the Priority Area Assistance Program (ZAP), a municipality included in the Priority Areas Development Program (PDZP) and a municipality included in the National Crusade Against Hunger Program, corresponding to PHASE 1 or PHASE 2 of operation.

Sources of information.

The data has been obtained from the "Report on poverty measurement in the United Mexican States 2010" of the National Council for the Evaluation of Social Development Policy (CONEVAL), where information corresponding to the following was extracted: Percentage of population in extreme poverty (% PE), Percentage of educational lag (% RE), Percentage of population with lack of access to food (% CAA), Percentage of population with Total Current Income per capita Monthly (% PIILBM), Percentage of population of 3 years and more speaker of indigenous language (% PHLI3 +) and the percentage of municipal social lag (GRM).

From the National Population Council, the information on the Degree of Municipal Marginalization (GMM) was obtained. The National Commission for the Development of Indigenous Peoples (CDI) obtained the classification of the Indigenous Region (REGIND), Type of Indigenous Municipality (TIPMUNIND) and Degree of Ethnolinguistic Replacement (GRE). And from the Ministry of Social Development (SEDESOL) the catalog of municipalities incorporated in the Priority Area Assistance Program (ZAP), the Priority Areas Development Program (PDZP) and Phase 1 or Phase 2 of the Program's operation was recovered. National Crusade against Hunger.

The social exclusion index (ES)[11] it is constructed as a weighted sum of 16 variables. The selection of the variables is an adaptation proposed by (Medel, 2016b) de (Subirats, 2004). The data source corresponds to the statistical information contained in the General Population and Housing Census for 2010.

Regression Model Binary Logistics.

Estimate the result of a categorical qualitative variable (a variable that adopts a limited number of categories, in our study, the value SI = (1) or NO = (0) for a municipality to be included in the National Crusade Against Hunger Program , which is a function of independent variables or predictors.

[11] See Medel-Ramírez C. (2017). Proposed methodology for estimating the index of social exclusion: the case of indigenous population in the state of Veracruz Mexico. Journal Mathematical and Quantitative Methods. ISSN 2531-2979 Vol 1 December 2017. Retrieved from:
http://www.rinoe.org/revistas/Journal_Mathematical_and_Quantitative_Methods/vol1num1/Journal_Mathematical_and_Quantitative_Methods_V1_N1_1.pdf

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Be:

Definition. Let Y be a binary dependent variable that takes two possible values (0 and 1). Let X1, ..., Xk be a set of independent variables observed in order to explain and / or predict the value of Y. [12]

The objective is to determine:

P [Y = 1 / X1, ..., Xk], where P indicates probability
So:
P [Y = 0 / X1, ..., Xk] = 1- P [Y = 1 / X1, ..., Xk]).

A model is built:
P [Y = 1 / X1, ..., Xk] = p (X1, ..., Xk; β)

Where:

p (X1, ..., Xk; β)
is a function that is called a link function (probability function) whose value depends on a parameter vector: β = (β1, ..., Bk) '.

Likelihood Function

In order to estimate β and analyze the model behavior, we observed a simple random sample of size n given by {(Xi '), Yi; i = 1, ..., n}

Where: Xi = (Xi1, ..., Xik), is the value of independent variables

Yi = {0,1} is the observed value of Y in the i-th element of the sample.
Y / (X1 ....., Xk) is distributed as binomial (1, p (Y = 1 / X1 ....., Xk; β))

The likelihood function is:

$$L(\beta/(x_1, y_1), \ldots, (X_n, Y_n)) = \prod_1^n p_i^{y_i}(1-p_i)^{1-y_i}$$

Where pi = p (xi ', β) = p (xi1, ..., xik; β) with i = 1, ..., n

The degree of prediction of the binary logistic regression model is a function of 1) the substantive interpretation, where the independent variables that intervene are a function of the research hypothesis, in addition to the interpretation of these relationships must be theoretically relevant; 2) its capacity for statistical prediction, since it must be significant and 3) it must comply with the principle of parsimony, that is, with a smaller number of variables present better goodness of fit.

The binary logistic regression model was processed using the statistical software IBM SPSS Statisc version 24, from which follows the following binary logistic regression model (Logit) to analyze the impact of the incorporation or not of a municipality in the National Crusade Program against Hunger. The binary logistic regression model uses the maximum likelihood method in estimating the coefficients in the model. (Visauta and Martori, 2003). To evaluate the significance of the estimated coefficients, the Wald statistic is used to test the hypothesis of whether the regression coefficients are equal to zero. In this sense, the criterion of statistical significance that is adopted is: $\alpha = 0.05$

Significance Tests

Once the model coefficients are estimated, it is necessary to verify if the model adequately predicts the dependent variable. To evaluate the goodness of the model, the logarithm of the likelihood ratio and the Hosmer-Lemeshow test are used.[13]

The hypotheses that are posed are:

H0: observed P = estimated P (the model is significant),
H1: P observed ≠ P estimated

Where:

Observed P = Observed value and
Estimated P = Probability estimated by the model.

[12] In this sense, the non-metric character of the dichotomous dependent variable is adapted by making predictions of belonging to a group and the probability that an event will occur (Hair et al., 2001). With this model what is interesting is to know how the changes in the elements affect the probabilities of response.

[13] The hypothesis is tested that the model found is the one that best fits through the likelihood ratio. See Hosmer D. Y Lemeshow S .; Applied Logistic Regression; Wiley Series in Probability and Statistics; 2nd edition, Canada, 2000.

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Testing of coefficients

Once the best set of explanatory variables that predict the dependent variable Y have been found, each coefficient must be evaluated to determine which one or which enter the model, this process is done by the Wald statistic. The hypothesis that arises is the following:

H0: βi = 0 The independent variable does not influence pi.
H1: βi is not equal to 0 The independent variable influences pi.

The interpretation of the results obtained is done from the coefficients of the model. For this, it is enough to take into account that if the adjusted model is adequate, then the model is said to be significant, but in addition, the degree of statistical association that exists in its parameters must be analyzed.

Where:

β1> 0 the risk factor will be greater than 1 and p (X1, X2 ....., Xk; β) will increase.
β1 <0 the risk factor will be less than 1 and p (X1, X2 ....., Xk; β) will decrease.
β1 = 0 the variable X1, has no effect on the probability of risk.

Binary logistic regression model.

Initial complete model

Logit P($PNCH_{F2}$) = $X'\beta$
con X' = *(1, Extreme poverty, educational lag, lack of access to food, population with income below the minimum welfare line, ICTPC, PHLI3YA, indigenous region, degree of municipal marginalization, degree of municipal lag, degree of ethnolinguistic replacement, TIPMUNIND, GES, Priority Area of attention, Priority Zone Development Program))*
β = ($\beta_0, \beta_1, \ldots \beta_{30}$)

Dependent variable

PNCHF2 = National Crusade Against Hunger Program (Phase 2)
Where:

1 = Municipality included in the National Crusade Against Hunger Program (Phase 2)
0 = Municipality not included in the National Crusade Against Hunger Program (Phase 2)

See Table 3 below.

			Predicted		
			PNCH PHASE 2		
	Observed		0	1	Correct percentage
Paso 0	PNCH PHASE 2	0	127	0	100.0
		1	85	0	.0
	Global percentage				59.9

a. The constant is included in the model.
b. The cut-off value is .500

Table 3 Classification initial complete model
Source. Own elaboration.

Where:

Independent variables

Quantitative variables:

PE = Percentage of the population living in extreme poverty.[14]

RE = Percentage of the population with educational backwardness.[15]

CAA = Percentage of the population with lack of access to food. [16]

PIILBM = Percentage of the population with income below the minimum welfare line.[17]

ICTPC = Total current income per capita per month.[18]

PHLI3YMAS = Percentage of the population aged 3 years and over that speaks an indigenous language.[19]

Categorical variables:

[14] See CONEVAL Poverty report at the municipality level 2010. Retrieved from: http://www.coneval.org.mx/Informes/Pobreza/Pobreza_municipal/pobreza%20extrema%20y%20alimentacion%20por%20municipio.zip
[15] See CONEVAL Poverty report at the municipality level 2010. Op. Cit.
[16] See CONEVAL Poverty report at the municipality level 2010. Op. Cit.
[17] See CONEVAL Measurement of poverty. Recovered from: http://www.coneval.org.mx/Informes/Pobreza/Pobreza_municipal/Tablas_dinamicas/TD_Veracruz.zip
[18] See CONEVAL Poverty report at the municipality level 2010. Op. Cit.
[19] See INEGI Intercensal Survey, Mexico, 2015 Retrieved from: http://www.beta.inegi.org.mx/contenidos/proyectos/enchogares/especiales/intercensal/2015/doc/eic2015_resultados.pdf

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REGIND = Indigenous region.[20]
Where:

Regind 1 = Chinanteca Indigenous Region
Regind 2 = Cuicatlán, Mazateca, Tehuacán and Zongolica indigenous region
Regind 3 = Huasteca Indian Region
Regind 4 = Indigenous Region Sierra Norte de Puebla y Totonacapan
Regind 5 = Indigenous region Tuxtlas, Popoluca-Náhuatl de Veracruz
Regind 6 = Municipalities that do not belong to an indigenous region

GMM = Degree of municipal marginalization.[21]
Where:

Very-high GMM = Very high degree of marginalization
AltaGMM = Degree of high marginalization
MediaGMM = Degree of marginalization
BajaGMM = Degree of low marginalization
Very low GMM = Very low degree of marginalization

*GRS = Degree of social backward*ness.[22]
Where:

Very-high GRS = Degree of very high social lag
AltaGRS = Degree of high social lag
MediaGRS = Degree of average social lag
BajaGRS = Degree of low social lag
Very-low GRS = Degree of very low social lag

GRE = Degree of ethnolinguistic replacement. [23]
Where:

GRE1 = Degree of ethnolinguistic replacement in equilibrium
GRE2 = Degree of ethnolinguistic replacement in slow expansion
GRE3 = Degree of ethnolinguistic replacement in accelerated extinction
GRE4 = Degree of ethnolinguistic replacement in slow extinction

TIPMUNIND = Type of indigenous municipality.[24]
Where:

Mi = Indigenous municipalities: those with 70% and more of indigenous population and with a percentage of 40 to 69 of indigenous population.
Mpi = Municipalities with an indigenous presence, those with less than 40% indigenous population but more than 5,000 indigenous people within their total population and with a significant presence of minority language speakers;
Mid = Municipalities with dispersed indigenous population, with less than 40% indigenous population and less than 5,000 indigenous

IES = Index of social exclusion.[25]
Where:

Very-high%% = Very high exclusion
AltaIES% = High exclusion
MediaIES% = Average exclusion
BajaIES% = Low exclusion
Very-low% = Very low exclusion

ZAP = Municipality included in the Priority Areas Attention Program.
Where:

1 = Municipality included in the Priority Zones Program
0 = Municipality not included in the Priority Zones Program

PDZP = Municipality included in the Priority Area Development Program.
Where:

1 = Municipality included in the Priority Area Development Program
0 = Municipality not included in the Priority Areas Development Program

[20] See CDI. Indigenous regions of Mexico. Retrieved from: https://www.gob.mx/cms/uploads/attachment/file/35735/cdi-regiones-indigenas-mexico.pdf
[21] See CDI. Socioeconomic Indicators of the Indigenous Peoples of Mexico, 2015. Retrieved from: http://www.cdi.gob.mx/gobmx-2017/indicadores/12-cdi-base-indicadores-2015.zip
[22] See CONEVAL Index of social lag 2010 at the municipal level and by location. Retrieved from: http://www.coneval.org.mx/Informes/Pobreza/Rezago_Social/Rezago_Social_2010/Rezago_Social_Estados_y_Municipios_2000_2005_2010.zip
[23] See CDI. Index of ethnolinguistic replacement. Retrieved from: http://www.inegi.org.mx/rne/docs/Pdfs/Mesa1/20/MiguelPalacios.pdf
[24] See CDI. Indigenous localities Catalog of Indigenous Locations 2010. Retrieved from: http://www.cdi.gob.mx/localidades2010-gobmx/catalogo_de_localidades_indigenas_2010.xlsx
[25] See Medel-Ramírez C. (2016a). "Evaluation of the degree of social exclusion and of multidimensional poverty in the indigenous localities in the State of Veracruz: The case of the program of development of priority zones." (Doctoral thesis). Economy faculty. Doctorate in Public Finance. Veracruz University. Mexico.

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MEDEL-RAMÍREZ, Carlos & MEDEL-LÓPEZ, Hilario. Complementarity analysis of the Priority Areas Development Program and the Priority Attention Areas Program in the National Crusade Against Hunger Program in indigenous municipalities in the State of Veracruz Mexico. ECORFAN Journal-Mexico 2018.

Selected method for the Binary Logistic Regression Model.- Advance in steps (Wald)[26]

Significance omnibus tests of model coefficients.- If the significance is less than 0.05, it indicates that the model helps explain the event, that is, the independent variables explain the dependent variable. In the adjustment of the Binary Logistic Regression Model.- Advance in steps (Wald) for PNCHF2. The level of significance is less than 0.05, so the model explains the PNCHF2 See Table 4.

		Chi squared	gl	Sig.
Paso 1	Step	6.306	1	.012
	Block	6.306	1	.012
	Model	**190.471**	**29**	**.000**

Table 4 Omnibus tests of model coefficients for PNCH F2
Source: Binary Logistic Regression Model.- Advance in steps (Wald) for PNCH F2

Rx-square of Cox and Snell, and R-square of Nagelkerke

It indicates the part of the variance of the dependent variable explained by the model. The higher the R-squared the more explanatory is the model, that is, the independent variables explain the dependent variable. See Table 5, below.

Step	Logarithm of verisimilitude -2	R square of Cox and Snell	R square of Nagelkerke
1	95.047[a]	.593	.801

a. The estimate has ended at the iteration number 20 because the maximum number of iterations has been reached. The final solution can not be found

Table 5 Model summary for PNCH F2
Source: Binary Logistic Regression Model.- Advance in steps (Wald) for PNCHF2.

The R squared of Cox and Snell is based on the comparison of the log of the likelihood (LL) for the model with respect to the log of the likelihood (LL) for a model of baseline. Its values oscillate between 0 and 1.

In this case it is a very discrete value (0,593) that indicates that 59,3% of the variation of the dependent variable is explained by the variables included in the model, on the other hand the R squared of Nagelkerke that indicates that 80.1% of the variation of the dependent variable is explained by the variables included in the model.

Hosmer and Lemeshow test

Shows the goodness of fit of a logistic regression model, by evaluating a high value of the predicted probability (p) will be associated with result 1 of the dependent binomial variable, while a low value of p (close to zero) will correspond to the result Y = 0. The value obtained in the Hosmer and Lemeshow test is> 0, so a goodness of fit is estimated in the PNCHF2 explanation. in the Binary Logistic Regression Model.- Advance in steps (Wald). See Table 6 and Table 7.

Step	Chi squared	gl	Sig.
1	4.116	8	.847

Table 6 Test of Hosmer and Lemeshow for PNCH F2
Source: Binary Logistic Regression Model.- Advance in steps (Wald) for PNCHF2.

Variables in the equation

		B	Standard error	Wald	gl	Sig.	Exp(B)
Paso 1[a]	Extreme poverty	.305	.120	6.488	1	.011	1.357
	Educational backwardness	.098	.086	1.287	1	.257	1.103
	Lack of access to food	.142	.047	4.523	1	.033	1.153
	Population with income below the minimum welfare line	.043	.099	.192	1	.661	1.044
	ICTPC	.003	.001	4.247	1	.039	1.003
	%PHLI3Y =	.007	.042	.025	1	.874	1.007
	Indigenous region			8.396	5	.136	
	Indigenous region (1)	-3.701	2.731	1.836	1	.175	.025
	Indigenous region (2)	-3.127	1.552	4.059	1	.044	.044
	Indian region (3)	-.176	1.665	.011	1	.916	.839
	Indigenous region (4)	22.737	8720.433	.000	1	.998	7487778568.000
	Indigenous region (5)	3.033	1.808	2.451	1	.117	20.703
	Degree of municipal marginalization 2015			4.478	4	.345	
	Degree of municipal marginalization 2015 (1)	-6.223	3.405	3.340	1	.068	.002
	Degree of municipal marginalization 2015 (2)	-3.090	2.017	1.395	1	.238	.045
	Degree of municipal marginalization 2015 (3)	-5.879	3.230	3.314	1	.069	.003
	Degree of municipal marginalization 2015 (4)	12.068	6430.242	.000	1	.999	174252.803
	Degree of municipal lag 2010			7.082	4	.132	
	Degree of municipal lag 2010 (1)	4.021	2.779	2.094	1	.148	55.771
	Degree of municipal lag 2010 (2)	5.501	2.190	6.311	1	.012	244.964
	Degree of municipal lag 2010 (3)	4.275	2.452	3.040	1	.081	71.868
	Degree of ethnolinguistic replacement			12.909	3	.005	
	Degree of ethnolinguistic replacement (1)	-2.884	.878	10.799	1	.001	.056
	Degree of ethnolinguistic replacement (2)	1.151	1.585	.340	1	.482	3.160
	Degree of ethnolinguistic replacement (3)	3.187	1.684	3.181	1	.058	24.209
	TIPMUNID			4.873	2	.087	
	TIPMUNID (1)	-4.283	1.940	4.873	1	.027	.014
	TIPMUNID (2)	-25.187	8720.433	.000	1	.998	.000
	Var-high%	-1.317	2.444	.291	1	.590	.268
	AltoEI1%	.017	.051	.080	1	.778	1.017
	MedioEI1%	-.021	.039	.304	1	.582	.979
	RezaEI1%	.011	.036	.088	1	.767	1.011
	Priority attention area (1)	3.179	1.209	5.000	1	.015	24.025
	Constant	-18.981	7.734	6.023	1	.014	.000

a. Variables specified in step 1: Priority attention area.

The variables are not in the equation

			Score	gl	Sig.
Step 1	Variables	Priority Area Development Program (1)	1.699	1	.192
		Global statistics	1.699	1	.192

Table 7 Tes Odd ratio estimation in the binary logistic regression model in the analysis of the National Cross-Hunger Program PHASE 2
Source: Binary Logistic Regression Model.- Advance in steps (Wald) for PNCH PHASE 2

Logit P (PNCH PHASE 2) = *-18.981 Constant + 0.305 Extreme poverty + 0.098 Educational lag + 0.142 Lack of access to food + 0.043Population with income below the minimum welfare line + 0.003ICTPC + 0.007% PHLI3Y + -3.701 Region indigenous (1) + -3,127 Indigenous region (2) + -0,176 indigenous region (3) + 22,737 indigenous region (4) + 3,033 indigenous region (5) + -6,223 degree of municipal marginalization 2015 (1) + -3,090 degree municipal marginalization 2015 (2) + -5,879 Degree of municipal marginalization 2015 (3) + 12,068 Degree of municipal marginalization 2015 (4) + 4,021 Degree of municipal lag 2010 (1) + 5,501 Degree of municipal lag 2010 (2) + 4,275 Grade of municipal lag 2010 (3) + 4.145 Degree of municipal lag 2010 (4) + -2.884*

[26] The results are presented from Block 4 of the Method selected for the Binary Logistic Regression Model.- Advance in steps (Wald). IBM SPP version 24.

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Degree of ethnolinguistic replacement (1) + 1.151 Degree of ethnolinguistic replacement (2) + 3.187 Degree of ethnolinguistic replacement (3) + -4.283 TIPMUNIND (1) + -25,387 TIPMUNIND (2) + -1,317 Very-high% + 0.017 AltaIES% + -0.021 MediaIES% + 0.011 BajaIES% + 3.179 Priority attention area (1).

Results and Discussion

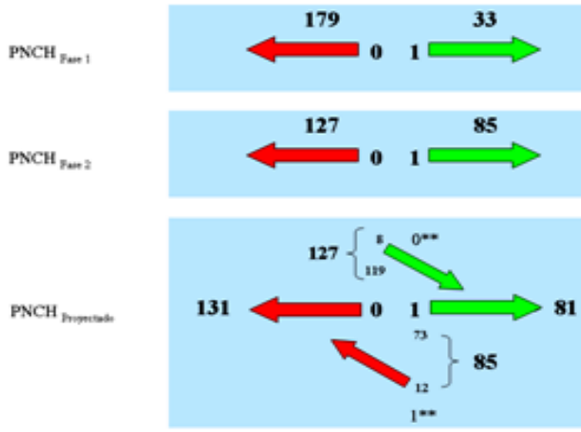
Overall percentage correctly classified.- This percentage indicates the number of cases that the model is able to predict correctly. Based on the regression equation and the observed data, a prediction of the value of the dependent variable (predicted value) is made. This prediction is compared with the observed value.

Where:

If correct, the case is correctly classified.
If not correct, the case is not correctly classified.

In Figure 4 below, presents for each of the phases of operation of the PNCH the number of municipalities that were selected in each stage, having the following, paragraph 1) and 2) refers to the selection of the municipality according to regulations legal expressed in corresponding decree:

1. In the first phase of the PNCH there are 33 municipalities included in the program.
2. In the second phase of the PNCH there are 85 municipalities included in the program.
3. Projected PNCH estimates whether the selected municipality corresponding to subparagraphs 1) and 2) corresponds to an assigned value = 1 and corresponds to a municipality included in the PNCH, obtaining that 73 municipalities are correctly classified and 12 corresponds to municipalities that They are not correctly classified. As regards the assigned value = 0 and corresponding to a municipality that is not included in the PNCH, it is observed that 119 cases are correctly classified and 8 municipalities that are not correctly classified. According to the information offered by the binary logistic regression model model, it is estimated that the overall percentage of the classification of the cases corresponds to 90.6%, and from this classification it is estimated that the municipalities that should be included in the PNCH are 81 and 131 should not be included. See Graphic 5, below.



Graph 5 Classification of selected municipalities in the PNCH according to the operation phase and Estimation of Projected PCNH
Source: Own elaboration.

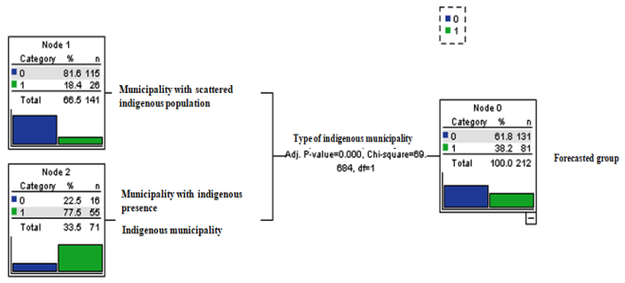
Municipalities included in the Projected PCNH. Of the 81 municipalities whose predicted result refers to the inclusion of the PNCH in Phase 2, 37 are indigenous municipalities, 26 correspond to municipalities with dispersed indigenous population and 18 to municipalities with indigenous presence. It is estimated that the percentage of municipalities that are included in the PNCH is 90.6%.

			Predicted		
			Projected PNCH		
	Observado		0	1	Correct percentage
Step 1	*Projected PNCH*	0	119	8	93.7
		1	12	73	85.9
	Global percentage		131	81	90.6

a. The cut-off value is .500

Table 8 Classification in predicted model for PNCH F2
Source: Own elaboration

Graphic 6 presents the classification tree of the municipalities according to the variable 1 that indicates included in the Projected PCNH and the variable 0 that indicates that it is not included in the Projected PCNH, the importance of the participation of the indigenous municipalities is observed and of the municipalities with indigenous presence in the Projected PCNH.



Graph 6 Classification tree Exhaustive CHAID method dependent variable PCNH Projected according to type of indigenous municipality
Source: Own elaboration

Of the municipalities 85 municipalities of the State of Veracruz included in Phase 2 of the PNCH, it is highlighted that those that meet the condition where (P observed = P estimated) this corresponds to 73 municipalities while 8 municipalities present the condition (P observed ≠ P estimated), so the total number of municipalities in the projected PNCH is 81. Table 9 below presents the information corresponding to the various indigenous regions that meet the condition of (P observed = estimated P) and (P observed ≠ P estimated).

Indigenous region	Included in PNCH PHASE 2 and included in projected PNCH (Observed P = estimated P)	Included in PNCH PHASE 2 and not included in projected PNCH (Observed P ≠ estimated P)
Chinanteca Region	**Playa Vicente.**	
Cuicatlán, Mazateca, Tehuacán and Zongolica regions	**Astacinga, Atlahuilco, Magdalena, Mixtla de Altamirano, Los Reyes, San Andrés Tenejapan, Soledad Atzompa, Tehuipango, Tequila, Texhuacán, Tezonapa, Tlaquilpa, Xoxocotla y Zongolica.**	**Coetzala**
Huasteca Region	**Benito Juárez, Chicontepec, Ilamatlán, Ixcatepec, Ixhuatlán de Madero, Tantoyuca, Álamo Temapache, Tempoal, Texcatepec, Tlachichilco y Zontecomatlán de López y Fuentes**	
Sierra Norte de Puebla and Totonacapan Region	**Cazones de Herrera, Coahuitlán, Cozquihui, Coyutla, Chumatlán, Espinal, Filomeno Mata, Mecatlán, Poza Rica de Hidalgo, Tihuatlán y Zacualco de Hidalgo.**	**Coatzintla**
Thoxtlas Region, Popoluca-Nahuatl de Veracruz	**Acayucan, Las Choapas, Hueyapan de Ocampo, Mecayapan, Minatitlán, Sayula de Alemán, Sotepan, Tatahicapan de Juárez, Uxpanapa y Santiago Sochiapan.**	**Pajapan, Zaragoza**
Municipalities that do not belong to an indigenous region	**Alpatláhuac, Altotonga, Aquila, Ayahualulco, Calcahualco, Coatzacoalcos, Comapa, Córdoba, Cuecomatepec, Huatusco, Ixhuatlán del Café, Xalapa, Juan Rodríguez Clara, Maxima Rezdrelo, Martínez de la Torre, Las Minas, Ozuluama de Mascareñas, La Perla, San Juan Evangelista, Santiago Tuxtla, Tamiahua, Tepatlaxco, Texistepec, Tuxpan, Veracruz y Zacualpan.**	**Cuichapa, Hidalgotitlán , Ixhuatlán del Sureste, José Azueta, Tonayán**
Total number of municipalities	73	8

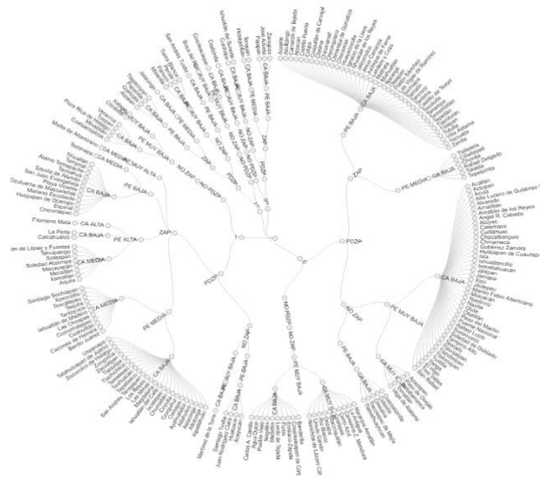
Table 9 Municipalities according to inclusion in the PNCH PHASE 2 and PNCH Projected according to indigenous region
Source: Own elaboration.

As regards the relevance with the PDZP, of the 81 municipalities indicated, 73 belong to a PDZP and present the following distribution: 37 are indigenous municipalities, 26 correspond to municipalities with dispersed indigenous population and 10 to municipalities with an indigenous presence. which present the following characteristics:

1. Indigenous Municipalities.- According to the degree of ethnolinguistic replacement, 8 municipalities are in equilibrium, 19 municipalities in slow expansion, 2 municipalities in accelerated extinction and 8 municipalities in slow extinction.
2. Municipalities with indigenous presence.- 2 municipalities are in equilibrium, 4 municipalities in accelerated extinction and 4 municipalities in slow extinction.
3. Municipalities with dispersed indigenous population. - 12 municipalities in accelerated extinction and 2 municipalities in slow extinction.
4. On the other hand, 8 the municipalities that do not belong to a PDZP correspond to municipalities with an indigenous presence.

Is important to point out that the 8 municipalities that are included in the PNCH but that are not in a PDZP are: Coatzacoalcos, Coatzintla, Córdoba, Xalapa, Minatitlán, Poza Rica de Hidalgo, Tuxpan and Veracruz.

These municipalities have the following characteristics: a) They are cataloged municipalities with an indigenous presence and that have an accelerated ethnolinguistic replacement degree; and b) they are municipalities that do not have the status of PDZP or ZAP, they have very low extreme poverty and very low food deprivation; low, low and very low exclusion rate. This information is presented in Graphic 7.



Graph 7 Municipalities of the State of Veracruz included in the National Program Against Hunger in PHASE 2 according to incorporation into the Priority Zone Development Program, Priority Attention Area, Extreme Poverty Grade and Degree of Food Deficiency. 2014
Source: Own elaboration.

Complementarity ZAP and PDZP.

In the next Graph 8 shows the information of the municipalities of the State of Veracruz according to the pertinence of incorporation in the ZAP or the PDZP according to their status as an indigenous municipality, with indigenous presence or dispersed indigenous population

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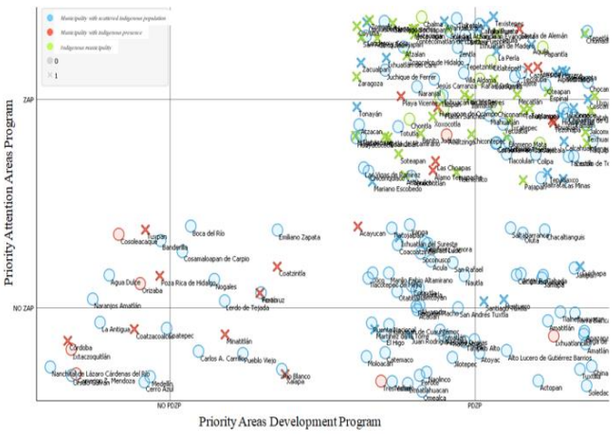

Graph 8 Dispersion of municipalities of the State of Veracruz included In the PNCH projected according to incorporation in the ZAP and PDZP according to indigenous presence. 2017
Source: Own elaboration.

From the point of view of the rules of operation of the PNCH, in which it is indicated that the municipalities incorporated in the strategy both PHASE 1 and PHASE 2 must be those that present a very high or high level of extreme poverty, one level very high or high food deficiency, as well as belonging to a ZAP or PDZP.

In the graph above you can see that the municipalities of Coatzacoalcos, Coatzintla, Cordoba, Xalapa, Minatitlan, Poza Rica de Hidalgo, Tuxpan and Veracruz do not comply with the regulations set forth in the rules of operation of the PNCH. In the same Graph 7, in the upper right quadrant it is observed in green indicator in "X" which identifies the municipalities incorporated in the PNCH and which are indigenous municipalities that meet the condition of being ZAP and PDZP.

Conclusions

The results of the adjustment of the binary logistic regression model that was conducted in order to assess the incidence of contextual factors to interpret the scope and complementarity with the efforts in the fight against poverty in the social expenditure strategy applied in the Priority Attention Areas Program (ZAP) and the Priority Areas Development Program (PDZP) in the strategy adopted by the federal government in the National Crusade Against Hunger Program (PNCH) in PHASE 1 and PHASE 2, particularly In the indigenous municipalities in the State of Veracruz, it is concluded that:

1. The incorporation of municipalities that have a very high or high degree of extreme poverty and a very high or high degree of food deprivation, even when they are necessary conditions, according to the rules of operation of the PNCH, these are not met, so The efforts in the fight against poverty to which the ZAP and PDZP strategies are directed are not complementary to the PNCH.

2. The indigenous municipalities such as Citlaltépetl, Coetzala, Chalma, Chiconamel, Chontla, Papantla, Platón Sánchez, Rafael Delgado and Tlilapan, even though they participate in the ZAP and PDZP strategy, these have been excluded from the strategy proposed in the PNCH PHASE 2.

3. There is no continuity in the fight against poverty, since the municipalities incorporated in the strategy Priority Attention Areas and Development Program of Priority Zones are not considered in the selection of municipalities incorporated in the National Crusade Against Hunger Program, situation that identify that the relationship between programs is not complementary.

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