

Comparative analysis of the agricultural risk administration mechanisms in Mexico

Análisis comparativo de los mecanismos de administración del riesgo agrícola en México

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DOI: 10.35429/JNAS.2020.21.7.26.32

Received July 25, 2020; Accepted December 30, 2020

Abstract

The agricultural sector in Mexico is vulnerable to climatic variations and the happening of natural disasters. We analyze the Component of Attention to Agricultural Incidents (CADENA in Spanish) that is focused on small peasants with low incomes, and without access to insurance coverage and the Agricultural and Rural Insurance Funds. (FAAR) they operate under the logic of mutualism, so they only offer coverage to their partners. The geographic coverage of both mechanisms is differentiated; the FAAR concentrate their operation in regions with high commercial value agriculture and the CADENA operates throughout the country promoting incentives for contracting catastrophic insurances in municipalities with high and a very high degree of marginalization. It is concluded that both mechanisms complement each other as a public policy for agricultural risk management.

Risk management, Insurance Funds, CADENA, catastrophic insurance

Resumen

El sector agropecuario en México es vulnerable ante las variaciones climáticas y ocurrencia de desastres naturales. Se Analiza el Componente de Atención a Siniestros Agropecuarios (CADENA) enfocado a pequeños productores de bajos ingresos y sin acceso a coberturas de seguro y los Fondos de Aseguramiento Agropecuario y Rural (FAAR) que operan bajo la lógica del mutualismo por lo que únicamente ofrecen coberturas a sus socios. La cobertura geográfica es diferenciada; los FAAR concentran su operación en regiones con agricultura de alto valor comercial y el CADENA opera en todo el país promoviendo incentivos para la contratación de seguros catastróficos en municipios con alto y muy alto grado de marginación. Concluyéndose que ambos mecanismos se complementan como política pública para la administración del riesgo agrícola.

Administración de riesgos, Fondos de Aseguramiento, CADENA, seguros catastróficos

Citation: LUQUEZ-GAITAN, Carlos Ernesto, GÓMEZ-GÓMEZ, Alma Alicia and HERNÁNDEZ-MENDOZA, Natividad. Comparative analysis of the agricultural risk administration mechanisms in Mexico. Journal of Natural and Agricultural Sciences. 2020. 7-21:26-32.

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Introduction

Agricultural activities are constantly exposed to catastrophic risks, the rural sector is the most affected since in addition to covering little more than half of the national territory, primary activities are the main source of income and food for the population of this sector.

Some of the investigations carried out to measure the possible consequences of climate change in Mexico conclude that severe damage to crops, soil erosion, inability to cultivate due to water saturation of the soils, adverse effects on water quality, water stress are expected. and increased livestock deaths, among others, caused a greater manifestation of extreme phenomena such as droughts, extreme rains, hailstorms and cyclones, (FAO-SAGARPA, 2012).¹

The National Center for Disaster Prevention (CENAPRED) ² reports that, in Mexico, in the period from 2000 to 2015, there were 2,419 hydrometeorological phenomena, such as torrential rain, drought, flood, tropical cyclone, frost, strong winds, hail and extreme (high) temperature, affecting 7.6 million ha of crops and pastures, exceeding 384 billion pesos in economic losses.

It is worth mentioning that the Mexican countryside has been developing in an area of inequality among producers; The Mexican Association of Credit Unions of the Social Sector (2015)³ indicates that the agriculturally more prosperous regions that access international commodity markets are concentrated in the north of the country and in a small group of producers with access to financing, technology, insurance, price coverage and important support from the federal government to maintain its competitiveness and export capacity to the United States and Canada, especially after the entry into force of the Free Trade Agreement in 1994 (NAFTA).

In a study carried out by (Escalante, 2010), he analyzes public policies for insurance in the Mexican agricultural sector and climate change through surveys of producers of different economic levels where he analyzes the responses of agricultural and livestock products from Mexico to the public policies to subsidize the insurance of their productive activities. Likewise, it indicates that risk management implies anticipating possible difficulties and planning how to reduce their consequences, highlighting that it is essential to implement agricultural insurance programs that allow adequate management of risk exposure and ensure conditions of relative equality to compete in agricultural markets. increasingly global.

In this context, insurance plays an important role, although it is not the solution to all the problems of the agricultural sector, but it is considered a useful tool to cushion the damage caused by natural phenomena before which producers are in constant risk. However, not everyone has access to insurance, the most vulnerable population are producers with the lowest income or who practice subsistence agriculture, there are insurance policies focused on this population, which provide access to financial instruments that allow the transfer of risks to specialized agents increasing the resilience capacity and also, ensuring the permanence of said producers in their agricultural activities.

Materials and methods

This research took as a reference the mixed approach from which qualitative and quantitative analysis are approached in a complementary way. The qualitative approach assesses the natural development of events, is based on an interpretive perspective, focused on the understanding of living beings, mainly humans and their institutions.

¹ FAO-SAGARPA. 2012. Mexico: the agricultural sector facing the challenge of climate change.

² International Center for the Investigation of the Phenomenon of the Child (CIIFEN). Approach for calculating risk: http://www.ciifen.org/index.php?option=com_content&view=category&layout=blog&id=84&Itemid=336&lang=es. Retrieved March 1, 2018.

ISSN: 2410-356X

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³ Mexican Association of Credit to the Social Sector. (February 2, 2015). Isuu Inc. Retrieved from Isuu.com: https://issuu.com/amucss/docs/documento_ve_agricola_v1

The quantitative approach uses data collection and analysis to answer research questions and test previously established hypotheses, and relies on numerical measurement, counting, and frequently the use of statistics to accurately establish patterns of behavior in a population (Hernández et al., 1998).

To address the quantitative approach, it was necessary to obtain information through SAGARPA directly from the General Directorate of Attention to Climate Change specifically for the component of Attention to Agricultural Sinestros better known as CADENA, also for the analysis regarding the FAARs, it was analyzed information provided by the National Integrating Body of FAAR (OINFA) and the (SAGARPA, 2014). The analysis starts from the following:

In the first place, an analysis of the damaged area was carried out with data from the SIAP in order to contextualize the agricultural losses at the national level in recent years which were complemented with data from CENAPRED to relate the main hydrometeorological phenomena that affected the agricultural sector. The damaged area, which is the difference between the sown area (ha) and the harvested area (ha) and in this case, it was obtained by state.

1) A comparison was made of two important mechanisms for the administration of agricultural risks in Mexico; the component of attention to agricultural claims of small producers (CADENA) and the Agricultural and Rural Insurance Funds, considering key characteristics such as legal framework, historical development in addition to the following aspects:

- Geographic coverage of both mechanisms, considering the following:

A. CHAIN: Historical coverage at the municipal level through the contracting of the various insurance schemes, as well as the coverage allowed in the SAGARPA operating rules.

B. Insurance Funds: Coverage according to its geographical scope of operation authorized in its constitutive document and attached to the Law of Agricultural and Rural Insurance Funds. Coverage is represented by authorized municipality, from the regional concentration point of view, this is by analyzing the number of Insurance Funds that affect the municipalities.

- Analysis of social coverage: an analysis was carried out of the types of producer that both mechanisms serve, jointly or differently, providing protection against natural disasters.

- Analysis of insurance products: The different insurance products, which are offered through both mechanisms, are analyzed by type of insurance, type of cultivation, type of cultivation, type of risks, etc.

The information for the analysis starts from the following:

1) The insurance coverage with information related to the coverage contracted by the governments of the federative entities and, where appropriate, by the SAGARPA, considering, insurance schemes, preferred beneficiary, insurance company, cycle, modality, crop, insured area, yield, total insured sum, total premium and risks protected at the municipal level as of 2003.

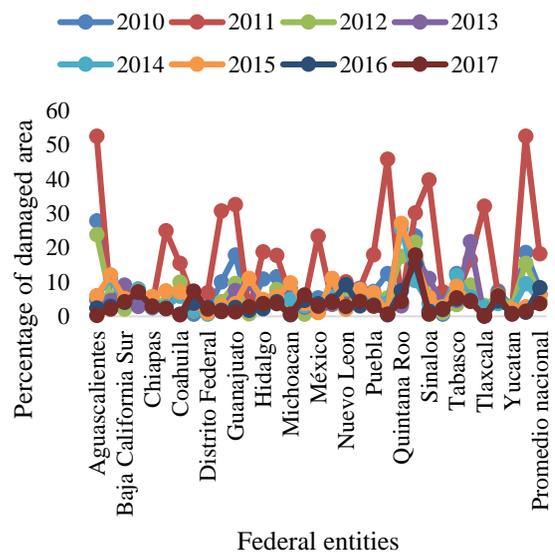
2) Compensation proceeding, with data of area or amount compensated, insurance company, and preferred beneficiary, at the municipality level.

Additionally, according to (Altamirano, 2001), in order to broadly compare the conditions in which both mechanisms operated and to have an overview of the efficiency of risk management, the following economic indicators were used:

1. Loss coefficient (CP) = (indemnities paid / premiums paid). Through this indicator the part of the premiums collected that is destined to the payment of claims is measured, the difference between this value and the unit indicates the part of the premium that the insurer has to cover its administration expenses, constitute reserves and profits . When the value is greater than 1, you are paying more in claims than what is being charged in premiums.
2. Claims ratio (IS) = (compensation paid / sum insured, it is an indicator of the risk itself, it measures the part of the sum insured that is paid as compensation. The premium that the insurer must collect from the insured is made up of this part plus the amount corresponding to the amount necessary to cover the costs of administration and operation, the constitution of reserves and the obtaining of profits.
3. Compensation per hectare (compensation paid / area insured) allows you to see the efficiency of the insurance operation. Indicates the amount paid in compensation for each hectare insured and represents the premium in pesos per hectare that the insurer needs to cover claims.
4. Premium per hectare (Premiums captured / insured area) It represents the cost that the insured and the government paid for each hectare that was insured and that the insurer uses to pay risks and cover costs. It consists of the Indemnity per hectare plus an additional charge to cover operating costs, obtain profits and establish reserves.

Results and discussion

An analysis of the area sown and harvested in recent years was carried out with information from the Agri-Food and Fisheries Information System (SIAP). The difference between the area sown and harvested is taken as losses in production that could be attributed to different factors, mainly attributed to climatic variation.



Graphic 1 Percentage of damaged area
 Source: Own elaboration with data from SIAP

The main phenomenon attributed to the losses in the agricultural sector for 2011 is a frost, according to information from SAGARPA, the region most affected by the frosts that occurred in February was the Carrizo Valley region, which includes the municipalities from Ahome and El Fuerte in Sinaloa and Álamos and Huatabampo in Sonora. According to information obtained from the SIAP, more than 100,000 hectares of various crops were affected in these municipalities, of which more than 80,000 hectares correspond to grain corn, which, due to the cultivated area, was the most affected (46% of the cultivated area), likewise, significant losses were recorded in crops such as safflower, beans, green tomato, zucchini, tomato, green chili and vegetables in values of 55, 20, 46, 65, 53, 44, and 72 percent of the damaged area, respectively.

The CADENA, according to its operating rules, maintains as an incentive differentiated co-participation percentages for the acquisition of insurance coverage. Until before 2010, when contracting catastrophic insurance coverage in municipalities with high and very high marginalization, the federal government contributed 90% of the cost of the premium and the governments of the states only 10%, and when it was a question of municipalities with medium, low, and very low degree of marginalization, the co-participation percentages corresponded to 70 and 30%, respectively.

Most of the Agricultural Insurance Funds operate in the most productive agricultural regions of the country, which are mainly concentrated in the northern part of the national territory. As can be seen in Figure 3, most of the Funds concentrate their operations in the states of Sonora, Sinaloa, Baja California, Chihuahua, Coahuila, Tamaulipas, Jalisco and Guanajuato. It is evident that in some municipalities there is a great density of funds operating, as is the case of Ahome, Angostura, Culiacán and Guasave in Sinaloa; Etchojoa, Cajeme and Navojoa in Sonora, in which more than 10 Agricultural Insurance Funds operate. This concentration is due to the fact that the agriculture that is practiced in these territories is characterized by corresponding to irrigation areas with high technology and high production volumes and yields, which favors the organization of producers and in turn the culture of insurance. Likewise, despite having wide geographic coverage, in the Bajío region only 2 FAA operate in each municipality. Although the Insurance Funds have had a good acceptance and growth in the Mexican insurance sector, there is a wide region that does not have their coverage; As shown in Figure 1, there are 1849 municipalities in which no Insurance Fund provides protection for agricultural risks. These municipalities are located in the central and southern regions of the country and in the mountainous and / or arid areas, which in turn are regions with higher levels of subsistence agriculture or with a livestock and / or forestry vocation.

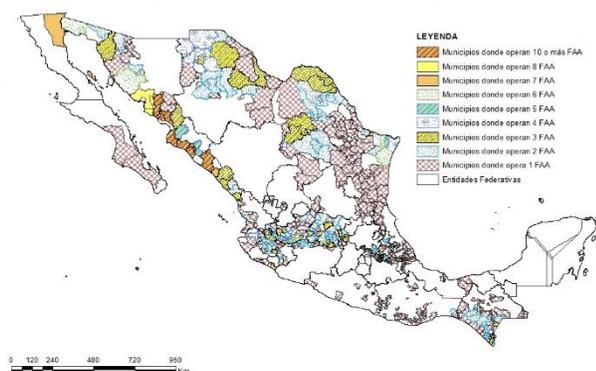


Figure 1 Geographic coverage of the Agricultural Insurance Funds
 Source: Own elaboration with information provided by the General Directorate of Attention to Climate Change of SAGARPA

The following shows in a general way the points to compare both the Component of Attention to Agricultural Claims before (CADENA) and the Agricultural Insurance Funds at the national level. It is worth mentioning that each of the mechanisms has evolved according to its legal framework and its way of operating, in this context the most relevant points are shown by mechanism.

Aspect	Component of Attention to Agricultural Claims (CADENA)	Agricultural and Rural Insurance Funds
Design and legal framework	It is created as a Fund for the care of rural producers affected by natural disasters, in compliance with article 129 of the Sustainable Rural Development Law. Since its creation, it has undergone several modifications giving greater impetus to the acquisition of catastrophic agricultural insurance coverage by the governments of the federative entities and the federal government and recently it has given impetus to the promotion of individual coverage through extraordinary subsidies to those who they purchase agricultural insurance.	They were conceived under the initiative of organized producers, based on the principle of mutuality, to provide agricultural insurance coverage exclusively to their partners. The Law of Agricultural and Rural Insurance Funds (LFAAR). As incentives for the promotion and acquisition of coverage, the Insurance Funds receive federal resources through the Agricultural Insurance Program, which operates through three Components: 1) Subsidy for the Agricultural Insurance Premium, 2) Support for Agricultural Insurance Funds and 3) Insurance Subsidy for Weather Contingencies.

Aspect	Component of Attention to Agricultural Claims (CADENA)	Agricultural and Rural Insurance Funds
Geographic coverage	The Operating Rules allow you to transfer resources to the 32 states to contract coverage or to the federal government to contract. As an incentive to provide coverage to the most unprotected regions, different percentages of federal-state resource sharing have been maintained depending on the degree of marginalization of the covered municipalities, with lower state contributions in municipalities with high and very high degrees of marginalization. With these measures, this policy has made it possible to have agricultural insurance coverage in up to 98% of the country's municipalities.	According to the LFAAR, an Assurance Fund, when it is constituted, it must specify the regions and municipalities in which it intends to operate, which is called the geographical area of operation, to which it will have to restrict its operations. Legally, in any productive zone of the country, an assurance fund can be established and operated. With the information analyzed, it was found that 405 Funds currently operate in 27 Federal entities, however, they are concentrated in the northern region: Sinaloa, Tamaulipas, Sonora, Chihuahua and in the Bajío region where Guanajuato and Jalisco stand out and with a very low incidence in the central and southern states, in which, in most cases, the established funds operate to cover industrial crops such as sugar cane, coffee, and bananas.

Aspect	Component of Attention to Agricultural Claims (CADENA)	Agricultural and Rural Insurance Funds
Social coverage	It is mainly focused on small producers considered by SAGARPA as low-income producers with areas of less than 20 ha.	It focuses on producers who are generally organized in associations, and who have the economic capacity to pay fees for the operation of the Assurance Fund to which they belong.
Types of assurance producto	The Component of Attention to Agricultural Claims manages: <ul style="list-style-type: none"> • Traditional damage insurance (agricultural branch) • Parametric • Vegetation indices • Production Guarantees 	Lon Assurance Funds manage: <ul style="list-style-type: none"> • Damage insurance in the agricultural branch (traditional) • Insurance of related goods • Life and personal accident insurance of its partners
Financial indicators		
1) Loss coefficient	0.24	0.82
2) Accident rate	.043	.0315
3) Compensation per hectare	\$63.87	\$705.11
4) Premium per hectare	\$196.43	\$859.43

Table 1 General comparison of mechanisms.
Source: Own elaboration with data provided by the General Directorate of Attention to Climate Change of SAGARPA

Conclusions

The analysis of the two risk management mechanisms shows that they are complementary since the Component of Attention to Agricultural Claims (CADENA) has as its target population low-income producers who cannot access insurance and, in turn, the greatest geographic coverage. This mechanism is found in states with municipalities that have high and very high degrees of marginalization. On the contrary, the Assurance Funds mainly serve organizations or legal entities and concentrate their insurance operations in the northern part of the country. Although in many cases both mechanisms affect the same municipalities, they serve different groups of producers since the operation of the CADENA according to its operating rules is concentrated in small producers without access to agricultural insurance on an individual basis and the Insurance Funds attend to organized producers, with the economic capacity to cover the different quotas established by law by the Funds for their administration and are commonly dedicated to the production of profitable crops with a higher technical level.

Considering the above, it can be affirmed that the sum of the efforts implemented through these two risk management mechanisms has allowed the different levels of government to provide attention to both low-income producers and others with better economic conditions; contributing to the construction of an efficient public policy for agricultural risk management.

Through the CADENA, public resources destined to natural disasters are strengthened, the participation of private companies in agricultural insurance is encouraged, the risk is dispersed more efficiently throughout the national territory since the same insurer can guarantee coverage for different risks in several states at the same time, at the same time it is possible to diversify the insurance products offered by insurance companies.

For their part, the Insurance Funds have the advantages of reducing or canceling moral hazard given that the same partners participate in the monitoring of the indemnities from, they allow their partners better management of their own resources in years with low claims, this represents an area of opportunity to promote those producers without some type of insurance but who at the same time have the resources to assume agricultural risks through the Assurance Funds.

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