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4 Mexico Agriculture Insurance Market Review

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CADENA Catastrophe Insurance: A Social Safety Net for Small-scale Farmers in Mexico

Reaching Small-scale Farmers with Agriculture Insurance

Natural disasters in Mexico have been increasing in frequency and severity in recent years, and the events recorded have had drastic impacts on agriculture. During the past two decades, over 80 percent of total economic losses from weather-related disasters occurred in the agricultural sector. Droughts, hurricanes, forest fires, and high temperatures damaged over 36 million hectares of crops between 1970-2002.

Compounding this issue is the segmentation of the farming sector, which faces increasing polarization. Only 0.7 percent of farms have over 100 hectares, yet these farms cover 29.3 percent of total agricultural area, while nearly half of all farms are less than 2 hectares. One of the main challenges for the development of affordable agricultural insurance in Mexico is to reach the large number of small-scale farmers who are scattered throughout the country, as the transaction costs are high for supplying conventional agricultural insurance to small-scale farmers.

As a solution to these issues, the Government of Mexico has clearly defined three target groups and has developed agriculture insurance programs and policies adapted to each group: (1) commercial farmers with access to credit for whom agricultural insurance is a requirement to obtain financing; (2) farmers with some difficulty obtaining credit, but that would be able to pool risks, purchase insurance and access credit; and (3) small-scale, vulnerable farmers with no access to credit or insurance. It is for this last group that the Component for the Attention of Natural Disasters (CADENA Program), was launched in 2003 under the Ministry of Agriculture, Livestock, and Fisheries (SAGARPA), making Mexico one of the first countries to recognize the opportunities for using macro-level catastrophe climatic agricultural index products as a social safety net product for small subsistence farmers for whom commercial crop insurance is not necessarily an appropriate or cost-effective mechanism. The CADENA Program has partially replaced traditional ad hoc post-disaster relief schemes with formal parametric crop and livestock insurance solutions at a State level.

The CADENA Model

The CADENA program contains two main components: (i) the Catastrophe Agricultural Insurance (SAC) programs for farmers, livestock producers, aquaculture farmers and fishermen and (ii) in States where SAC is not provided, the continued direct support (*Apoyo Directo*) compensation payments to farmers for climatic disasters.

The CADENA-SAC Component

Under the CADENA-SAC Macro-level Parametric and Index Crop and Livestock Insurance Programs (see details in Table 1), State Governments purchase insurance to protect their budgetary allocations to natural disaster compensation for the most vulnerable farmers. The State is the Insured, and the premiums are financed by the Federal and State Governments; in 2012 the Federal subsidies were 75-90 percent of the costs of premiums, with higher subsidies for areas with high degrees of marginalization. Small-scale, low-income farmers without access to commercial crop, livestock, or aquaculture insurance are the intended beneficiaries of the insurance coverage, and the program is designed to provide a minimum level of compensation to smallholder farmers to put them back into production following a major catastrophic event.

There are strict criteria defining which small-scale farmers are eligible to benefit from CADENA-SAC policies, which were significantly expanded in 2013. Previously in 2011, the program was limited to farmers without any other form of public or private agricultural insurance and who owned and/or cultivated less than 10 hectares of annual crops and/or 5 hectares of perennial fruit crops (increased to 10 hectares of perennial fruit crops in 2012), or who owned less than 45 Livestock Units (LUs; increased to 50 LUs in 2012). In 2013 the criteria were

Table 1. CADENA-SAC Crop and Livestock Insurance Products and Programs

No.	Type of CADENA Catastrophe Insurance Program	Basis of Insurance and Indemnity	Insured Perils
1	**Parametric Crop Weather Index Insurance** (*Seguro Agrícola de Indices Climáticos*, SAIC)	Weather Indices measures at ground stations	Drought, excess rain, flood, hurricane wind storm
2	**Crop Area-yield Index Insurance** (*Seguro Agrícola de Índices de Producción*, SAIP)	Area-Yields measured by in-field loss assessment	Comprehensive Multiple-peril
3	**Livestock-Pasture NDVI** (*Seguro Pecuario de Índices de Vegetación*, SPIV)	Satellite measured NDVI Index	All perils which reduce pasture growth (mainly drought)
4	**Traditional Livestock** (*Seguro Pecuario Catastrófico*, SPC)	Decreased forage and extraordinary weight loss in animals	Drought

Source: *Authors based on SAGARPA definitions.*

expanded to 20 hectares of annual crops and 60 LUs, representing a significant expansion of eligible farmers under the program.

At its inception in 2003, the CADENA-SAC programs were exclusively underwritten by Agroasemex, the parastatal agricultural reinsurer, but since 2004 the Government has actively promoted participation by the private commercial insurance sector. When a State Government does not request coverage, SAGARPA is entitled to purchase insurance cover in its own right and pay its percent of the premium (between 75 to 90 percent of the total); under this system SAGARPA insures exclusively through Agroasemex and all indemnities go directly to SAGARPA. Otherwise, and if the State Government requests coverage and pays its percent of the premium (between 10 to 25 percent of the total), it can insure with any of the three private commercial insurance companies (or even Agroasemex), and all indemnities would go directly to the State Government. An uninsured State can also still benefit from CADENA Direct Support payments in the event of a catastrophe.

The State Governments are responsible for identifying the planted area of each crop or the number of animals in each municipality they intend to insure, and the total sum insured is then calculated using standard unit sums insured. In the event of a triggered payout, the payment is made to the State Government (or to SAGARPA, if that would be the case), and it is the responsibility of the State Government (or SAGARPA) to distribute the benefits to the farmers in the affected areas.

The CADENA-Direct Support (Apoyo Directo) Component

Where a State declines to purchase a catastrophe agricultural crop or livestock insurance program, it can still benefit from the CADENA Direct Support (*Apoyo Directo*) payments in the event of a catastrophe event being declared by an independent and competent authority. Up to 2012, the National Commission of Water (CONAGUA) was responsible for declaring a hydro-meteorological catastrophe event and the National Center for Disaster Prevention (CENAPRED) was responsible for geomorphic events (earthquakes, volcanoes, etc). However, in 2013, the procedures were modified to transfer responsibility for the declaration of a catastrophe event triggering direct payments to the State Governments in conjunction with the state-level delegation of SAGARPA.

The CADENA budget includes an allowance for Direct Support payments where insurance has not been purchased or where crop insurance cover does not insure against certain types of damages. The main difference is that in this case, SAGARPA will only compensate 50 percent (increased to 60 percent in 2013) of the total estimated or assessed costs of the damages and the State is obliged to fund the other 50 percent (reduced to 40 percent in 2013) share of the direct costs. There are obvious incentives for a State to purchase parametric or traditional catastrophe insurance cover, because in this case SAGARPA will finance between a minimum of 75 percent (increased to 80 percent in 2013) and a maximum of 90 percent of the costs of the premiums.

Key Features of CADENA-SAC Programs

- CADENA offers macro-level crop and livestock catastrophe insurance programs.
- Small-scale, vulnerable farmers are the intended beneficiaries.

- CADENA is a Group Risk Crop Insurance and pays to all farmers in the group if the policy is triggered.
- CADENA crop insurance policies are issued by the public parastatal reinsurer Agroasemex and three private insurance companies, all of which are reinsured by international reinsurance companies on a proportional quota share basis.
- The State Government is normally the Insured under CADENA coverage (except in cases where the State Government declines to purchase insurance and SAGARPA purchases coverage), and is responsible for distributing payments to beneficiaries in the case of a triggered payout.

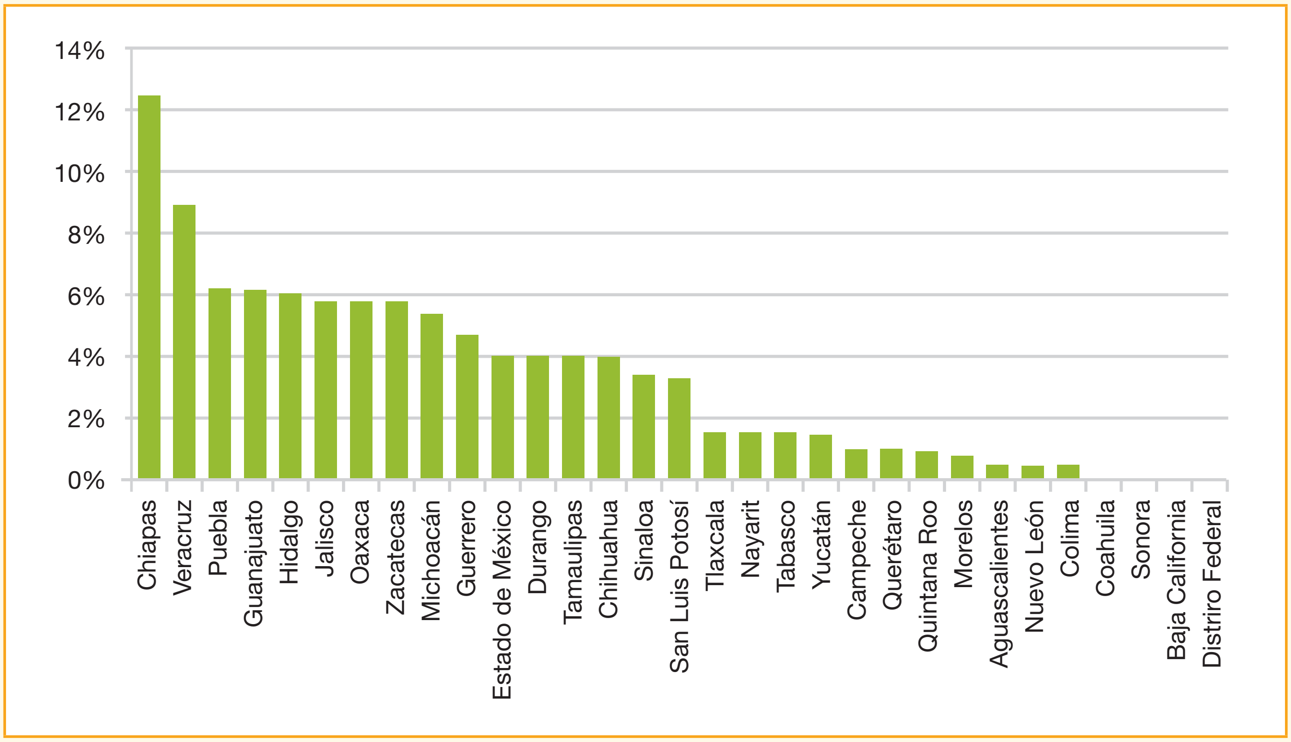
Results

The CADENA-SAC programs have become very popular with Mexico's Federal and State Governments and have expanded coverage greatly over the past 9 years; since 2008 30-31 of Mexico's 32 States have been covered. In 2011, the CADENA Program insured about 8 million hectares of crops, and slightly over 4.2 million head of livestock, representing 56 perecnt of the target group of 4.5 million subsistence smallholders farming 16.5 million hectares. The Total Sum Insured has grown rapidly over this period to slightly greater than MXP 12 billion in 2011. The program has been concentrated in the relatively poorer states with a high proportion of small subsistence farmers such as Chiapas, Veracruz, Puebla, and Guanajuato. Figure 2 shows the cumulative Insured Crop Area by State over the past nine years.

The average premium rates are relatively high, reflecting the catastrophe or covariate nature of the insured perils and the high risk exposure to droughts, hurricanes, frosts, and floods in Mexico. The Federal Government's CADENA budget has increased significantly over recent years, and in 2012 stood at US$232.7 million. Due to the expansion in coverage, as well as an increase in direct payments, higher subsidies to basic catastrophe level coverage (SAB), and the increased share of SAC premiums, SAGARPA is expected to incur a 26 percent increase in expenditures on the program.

Evidence shows that CADENA has been successful as a tool to reach the most vulnerable farmers in the country. An independent evaluation of the program conducted in 2009 confirmed that more than 90 percent of surveyed beneficiaries were primarily involved in agricultural crop livestock and fishing activities, and that nearly 70 percent of crop beneficiaries managed less than 5 hectares of crops. 99 percent of the surveyed beneficiaries reported they had returned to their agricultural activities after a climatic event thanks to the benefits they had received

Figure 1. CADENA: Insured Crop Area by State (% of Total Insured Area), 2003 to 2011



Source: SAGARPA, 2012.

from the program. However, surveyed beneficiaries (as high as 72 percent of crop producers) noted that the payouts were inadequate to cover the costs of their investments in their agricultural enterprises, although 97 percent of respondents advised that all affected farmers in their locality had received assistance from the program.

Challenges, Lessons Learned and Options for Strengthening CADENA

CADENA has encountered considerable success in providing basic catastrophe protection for the most vulnerable farmers in the country. Based on recent experience, the following lessons learned and options for strengthening the program are proposed:

1. The Government and the private and public insurance industry might wish to consider forming a pool to underwrite the CADENA agricultural crop and livestock insurance programs because: (1) the formation of a coinsurance pool would eliminate the need for the tender process and reduce charges of unfair competition by the insurance industry; (2) it would require that the insurance companies collaborate in providing the most cost-effective products and services to Federal and State Governments as opposed to competing against each other on pricing; (3) it might encourage a much wider participation by the Mexican insurance market in the knowledge that the pool leader (or managing underwriting committee) would act on their behalf; (4) the pool approach would offer the potential to share the costs of product research and development among pool members; (5) the costs of loss assessment on the indemnity-based crop and livestock programs could be shared; (6) a pool would potentially enable each participating company to achieve a much wider and more balanced spread of risk; and finally (7) there would be potential cost savings to insurers and the Government in the purchasing of a single comprehensive reinsurance plan for the CADENA pool. **Option: Develop a Coinsurance Pool Arrangement for CADENA.**

2. An important potential source of fiscal volatility in addition to mutual funds (Fondos) and Agroasemex could come from the SAGARPA's weather safety net programs. CADENA currently insures about 56 percent of the low income eligible population for money transfers in case of a natural disaster that hits the productive capacity of the farming sector, and the Government plans to expand the program's coverage in the future. Under the CADENA-SAC component the State and Federal Governments' financial exposure is transferred to the insurance sector. However, under the Direct Support (*Apoyos Directos*) component, the Government faces an unknown and unlimited liability in the event of catastrophe climatic events occurring during the agricultural year and this represents a major potential source of fiscal volatility to the Government. Despite efforts from SAGARPA and the Ministry of Finance to buy catastrophe excess of loss insurance for the *Apoyos Directos* program, a better long-term strategy might be to generate the conditions for the expansion of the CADENA program. **Option: Expand the CADENA program in place of the *Apoyos Directos* program.**

About the Authors

This paper contains a partial summary of the report "Mexico: Agriculture Insurance Market Review" (June, 2013) which was authored by a World Bank team led by Diego Arias (Senior Agriculture Economist, LCSAR) and composed of Charles Stutley (Senior Agriculture Risk Management Specialist, LCSAR), William Dick (Senior Agriculture Risk Management Specialist, LCSAR), Sandra Broka (Senior Rural Finance Specialist, ECSAR), Michael Grist (Senior Financial Sector Specialist, FCMNB), Hector Peña (Economist, LCSAR), Sophie Storm Theis (Environmental Specialist, LCSSD), Mildred Brown (Economist, LCSOS), Miguel Camarillo (Agriculture Insurance Specialist, LCSAR), Marcelo Angione (Agriculture Insurance Specialist, LCSAR), Héctor Ibarra (Senior Financial Officer, FABBK), Erika Salamanca (Project Assistant, LCSAR) and Ariel Donnini (Senior Agriculture Reinsurance Specialist, LCSAR).

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