POLICY NOTE - BRAZIL
AGRICULTURAL MARKET INSURANCE DEVELOPMENT

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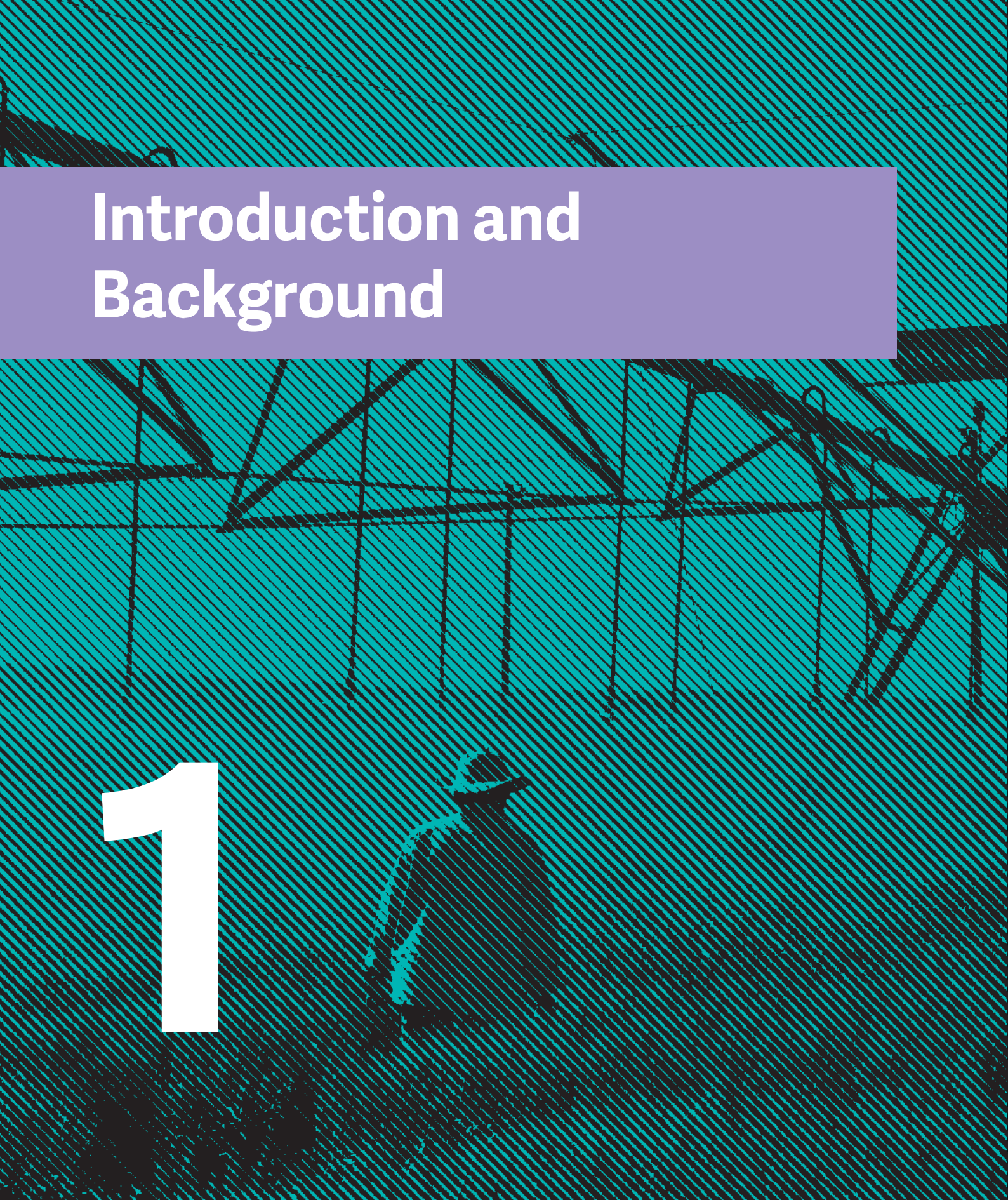
ACRONYMS

AGRITEMPO	Agro-meteorological Monitoring System
AYII	Area yield index insurance
BCB	Central Bank of Brazil (Banco Central do Brasil)
CNA	Brazilian Confederation of Agriculture and Livestock
CGGS	Garantia Safra Steering Committee
COMPRESS	Consisted, Filled and Spatialized Meteorological Database
EMBRAPA	Brazilian Agricultural Research Corporation
FENSEG	National Federation of Insurance
FESR	Crop Insurance Stabilization Fund
GS	Harvest Guarantee program for smallholder farmers in NE Brazil
IBGE	Brazilian Institute of Geography and Statistics
IRB	Brazilian Reinsurance Institute
MAPA	Ministry of Agriculture, Livestock and Food Supply
MDA	Ministry of Agrarian Development
MF	Ministry of Finance
MPCI	Multi-peril Crop Insurance
MPOG	Ministry of Planning, Budget and Management
PML	Probable Maximum Loss
PPP	Public Private Partnership
PROAGRO	Guarantee Program for Agricultural Activities
PROAGRO MAIS	Guarantee Program for Agricultural Activities of Family Farms
PRONAF	National Program for Family Agriculture Strengthening
PSR	Government Premium Subsidies Program for Agricultural Insurance
SICREDI	Cooperative Credit System
SIDRA	IBGE Automatic Recovery System
SUSEP	Superintendence of Private Insurance
TARSIM	Turkish Agricultural Insurance Pool
TSI	Total Sum Insured
WII	Weather Index Insurance
WRSI	Water Requirement Satisfaction Index
ZARC	Agro-climate Risk Zoning



Introduction and Background

1

1.1 Background to Agricultural Risk management in Brazil, Issues and Challenges

On average, the agricultural sector at the primary production level loses around R$11 billion (equivalent to 1% of the Agricultural GDP) because of the occurrence of extreme events[1]. Given the importance of this economic sector in the generation of foreign exchange and employment[2], the average losses for the entire economy may be substantially more when counting the damage, losses and impacts experienced by other stakeholders, including state and federal governments.

Over the last decades, the government of Brazil has developed a risk management strategy with the goal of reducing the volatility of cash flow in the agricultural sector and the vulnerability of the less privileged stakeholders in the rural areas (i.e. family farmers). The risk management strategy has mainly consisted in designing policies and programs that finance the implementation of a series of ex-ante (i.e. PSR) and ex-post (i.e. Garantia Safra) financing instruments.

The responsibility for the operation of such risk management programs is currently fragmented among federal institutions, including the MAPA, MDA, Banco do Brasil, Central Bank (BACEN) and Ministry of Finance. Interestingly, not all the risk management efforts carried out in the country are well coordinated. This situation has led to a disorganized growth of public intervention, thus increasing pressure systematically on fiscal resources because of the duplicity of efforts.

For instance, data and information are generated independently, and rarely is there any sharing between institutions about regions and target population being reached by their programs. Save in exceptional circumstances, the lack of a centralized database and information system on risk management programs prevent public institutions to cross check basic and essential data and information, and avoid overlap and duplication. This situation, together with the increasing pressure that extreme shocks (i.e. production risks and price risks) exert on the agricultural sector may challenge its sustainability.

1 World Bank, 2015
2 A recent study published in 2015 by the World Bank shows that the agricultural sector accounts around 46% (or more than US$7 billion) of the total exportations, and generates around 33% of all employment.

Setting up a comprehensive national agriculture risk management strategy (and subsequent plan/policy) and ensuring an effective inter-institutional and inter-departmental coordination, could be a more effective way than merely increasing the budget of existing programs (or creating new ones) to reduce the exposure of the agricultural sector to shocks. In this regard, most stakeholders in Brazil agree that existing agriculture risk management programs in Brazil should be reviewed with the aim of improving the allocation of fiscal resources and guaranteeing a greater positive impact on programs´ target population. To this end, Brazilian authorities are looking to learn from international experiences and examining an integrated public-private partnership (PPP) system for agricultural insurance that helps the government (both Federal and State) to improve fiscal resilience to shocks and reduce farmers´ vulnerability to disasters.

1.2 Objective & Scope of policy note

The objective of the policy note is to identify the opportunities in the improvement of the agricultural insurance system through policy and program reform. In particular, the note focuses on: (i) the strengthening of the existing legal and regulatory framework, (ii) the institutional and operational framework, and (iii) the improvement of existing government funded programs. The Policy Note tries to address the following questions:

- Is there enough data and information to assess the costs and benefits of income public sector programs that provide income compensation (such as Garantia Safra)?
- Is there room for the development of an integrated PPP system for agricultural insurance in Brazil?
- What changes to the current legal and regulatory framework, institutional and operational framework must be introduced?
- Is there scope to improve the cost-effectiveness of government programs, in particular the ones offered by the Government (i.e. Guarantee Program for Agricultural Activities – PROAGRO, Garantia Safra), through the introduction of risk transfer instruments?

Overview of Agriculture and Risk Exposures in Brazil

2

2.1 Importance of the Agricultural Sector in the Brazilian Economy

The agricultural sector has contributed to the expansion of the Brazilian economy over the past four decades. In 2012, the country ranked "third among the world´s major agricultural exporters and fourth for food products"[3]. Brazil leads the world in beef exports, as well as in several agriculture commodities such as sugar, coffee, orange juice, tobacco, soybeans and ethanol[4]. This privileged market position has been achieved because of a series of competitive advantages the country has compared to others, including (i) large diversity of soils and climatic conditions; (ii) water availability for crop production; (iii) large private and public investments in up-to-date production technology that improves the sector´s efficiency[5] and agriculture credit; and (iv) implementation of economic reforms and export orientation.
In terms of the contribution of the agribusiness to the Brazilian GDP, the gross production value registered from 2006 to 2013 has remained stable, with 23% as an average value during the same period. Agriculture share to the national GDP rises to 5.8% and it has contributed to more than half of the poverty reduction over the last quarter of a century[6].

From 1970 to 2006, the performance of the agricultural sector has shown a clear growth trend. During this period, the analysis of the Total Factor Productivity (TFP) showed that the productivity gains explains 65% the increase in the amount of products; whereas 35% was due to the increased use of inputs[7]. Not surprisingly, the growth performance of the sector is heterogeneous among regions because disparities in availability of natural resources.

For instance, the Northeast region is less productive than other regions of the country because of a series of weather constraints (i.e. irregular and low precipitation regimes, high temperature) and because it has one of the less integrated productive chains[8]. It is therefore not surprising that the Northeast region has one of the highest levels of poverty[9] and the highest concentration of family farmers.

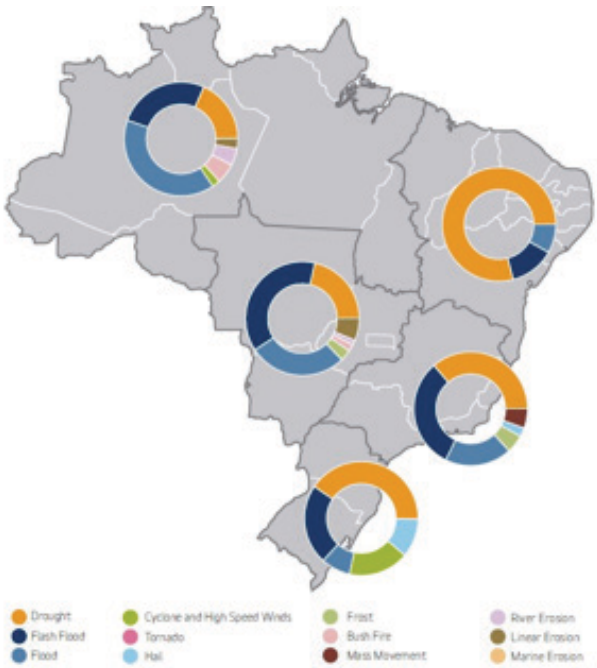
3 Dahr, 2012, pp. 1
4 n.a., 2010; Santana and Nascimento, 2012
5 n.a., 2010
6 Dahr, 2012
7 Gasques et al. (2010)
8 EMBRAPA, 2006, cited in Fornazier and Filho, 2012, pp. 8
9 Araujo and Mancal, 2015.

2.2 Climate and other risk exposures to agriculture

According to the OFDA / CRED international database on disasters, severe droughts account around 50% of the most catastrophic events ever recorded in the country[10]. During the last fifteen years, the cumulative economic damage caused by four extreme events (2004, 2012 and 2014) accounted US$8,11 billion in the Brazilian economy. The Northern and Southern regions are the geographic areas most impacted by droughts.

In terms of the frequency and the number of people affected, flash floods are also recurrent and high- impact events. Since the early 1990s, flash floods have made 1.3 million people leave their homes. Figure 2.1 shows other events that trigger natural disasters in Brazil.

Figure 1. Distribution of natural disasters by region, Brazil (GFDRR, 2014).



10 The period analyzed under the OFDA / CRED disaster database was from 1900 to 2015.

Despite of the fact that the agricultural sector in Brazil is highly exposed to natural hazards, there is not a mechanism to record the damages, losses and impact caused by such events in a systematic manner. Consequently, it is no possible to establish parameters of comparison between States and crops based on the analysis of historical information.

In a search for reducing the information gap on the effects of hazards in the primary agricultural sector, the World Bank, in collaboration with several government institutions and development agencies, analysed the variability of crop yields recorded by the Brazilian Institute of Geography and Statistics (IBGE). This analysis concluded that extreme hazards, on average, are responsible for a drop of approximately 1% (or R$1 billion) in the agricultural gross production value every year[11].

2.3 Impact of climate and other natural disasters on Brazilian Farmers

A series of studies on climate change show that the effects on the agricultural sector may vary depending on the region under analysis. Six different climate scenarios show that it is likely to experience a rise of temperature by the end of this century. Under the most optimistic and pessimist scenario, where temperature may rise from 1.4˚C to 5.4˚C, respectively, the agricultural sector is likely to experience a reduction of the low risk productive areas of pasture and crops by 2020 and 2030[12]. By 2050, losses in soybean would be around half out of an estimate total of US$4 billion on food grains; whereas it is likely to experience US$1 billion in losses in coffee by the same period.

In the event of a global warming scenario, where the global temperature increases up to 4˚C or more, low risk productive rice areas will be limited to those regions benefiting from irrigation systems. Similarly, regions suitable for beans production will significantly be reduced, thus limiting the planting areas to those States that are less affected by high temperatures and deficit on rainfall regimes. These States include Paraná, Santa Catarina and Rio Grande do Sul[13]. Because of changes on weather patterns, agricultural losses in Northeast Brazil are likely to be pronounced, including for those crops drought resistant such as cotton[14].

11 World Bank, 2015
12 Assad et al (2013a)
13 Nobre et al. (n.d.)
14 Assat et al, 2013b

Agricultural Insurance Programs in Brazil

3

3.1 Policy framework and roles of public and private sectors

Agricultural primary production is a very risky economic activity that is exposed to systemic losses. Over the years, Brazilian policy-makers have designed a series of risk management programs with the aim of reducing the harmful effects of hazards (either weather events, sanitary hazards or extreme price fluctuations[15]) on the national economy, but mainly in the rural regions where the economic livelihood of its inhabitants largely depends on agricultural-related activities[16].

Because risk management can be addressed in different ways, the government of Brazil has recognized the effectiveness of implementing broad-based risk preparedness, risk mitigation, and risk transfer measures simultaneously. These measures have contributed not only to the growth of the economy; but also to the reduction of extreme poverty levels, the raise of productivity and production among the family farming segment, and the increase in the inclusion of vulnerable population in economic growth[17].

Brazil has a long history in the implementation of agricultural insurance products and direct income compensation programs to reduce farmers´ income volatility. Furthermore, the government has developed a series of supporting tools and mechanisms to speed the decision-making process of both public and private institutions; and encourage the involvement of the private sector, thus reducing the share of the public intervention[18]. Some of the most notable efforts carried out by the Brazilian authorities include:

(i) Develop a coherent legal framework and institutional framework (i.e. Establishment of norms for the operation of agricultural insurance products, the operationalization of the Crop Insurance Stabilization Fund – FESR, others).

(ii) Design and establishment of weather (i.e. Agro-meteorological Monitoring System - AGRITEMPO[19], and Consisted, Filled and Spatialized Meteorological Database - COMPRESS) and agricultural statistics information systems (i.e. IBGE Automatic Recovery System – SIDRA[20]).

15 Guimarães and Nogueira, 2009
16 OECD – FAO, 2015
17 OECD – FAO, 2015
18 Alberti and Leopoldi, 2001; cited in Silva, Texeira and dos Santos, 2013.
19 https://www.agritempo.gov.br
20 http://www.sidra.ibge.gov.br/bda/acervo/acervo9.asp?e=c&p=PA&z=t&o=11
21 It is estimated that the TFP rises by 0.2% when the government increase 1% in spending on EMBRAPA research programs (Gasques, Bastos and Bacchi, 2009, cited in Gasques, Filho and Navarro, 2010, pp. 36).

(iii) Finance scientific research in agriculture (i.e. EMBRAPA[21]).

(iv) Subsidize agricultural insurance premiums (i.e. Government Premium Subsidies Program for Agricultural Insurance – PSR).

(v) Finance agriculture income compensation programs (i.e. Bolsa Estiagem and Garantia Safra)

The following table 1 depicts the general characteristics of the most popular insurance programs and income compensation programs. The specifics of each program are described in section 3.2 and 3.3.

Table 1. List of agriculture insurance and income compensation programs in Brazil

NAME	SCHEME	TARGET GROUP	LEGAL FRAMEWORK	SOURCE OF FUNDING
Government Premium Subsidies Program for Agricultural Insurance (PSR)	Private sector Commercial Insurance	Commercial Farmers	Law 10.823 Decree No 5.121 Legal resolution No. 5, No. 13, No. 14, No. 17, No. 21, No. 27, No. 33- 42, No. 46 Complementary Law No. 127 and N. 137	MAPA (Federal Funding)
PROAGRO	Public Sector Pseudo insurance	Small and middle-sized farmers	Law 5.969/1973 Law 8.171/1991, Decree 175/1991, NMC (National Monetary Council) Rural Credit Manual (MCR-16).	Federal government Producers Revenues from financial surpluses.
PROAGRO Mais	Public Sector Pseudo- insu-rance	Small-sized farmers linked to PRONAF	NMC (National Monetary Council) Resolution Nº 4.186, January 31st, 2013	

(continuation)

NAME	SCHEME	TARGET GROUP	LEGAL FRAMEWORK	SOURCE OF FUNDING
Garantia Safra Program	Public Sector Pseudo- insurance	Small-sized farmers (PRONAF category B and C)	Law 10.420/2002 Decree No. 4.962/2004 MDA´s legal ordinance 01/2007 MDA´s legal resolution 2/2013 CGGS legal resolution 2/2011 CGGS legal resolution No. 1 (19/06/2015)	Federal Government. Producers The nine state governments of the Northeas Municipalities, Producers
Bolsa Estiagem	Public Sector Pseudo- insurance	Small-sized farmers not covered by Garantia Safra	Law 10.954/2004	Federal government

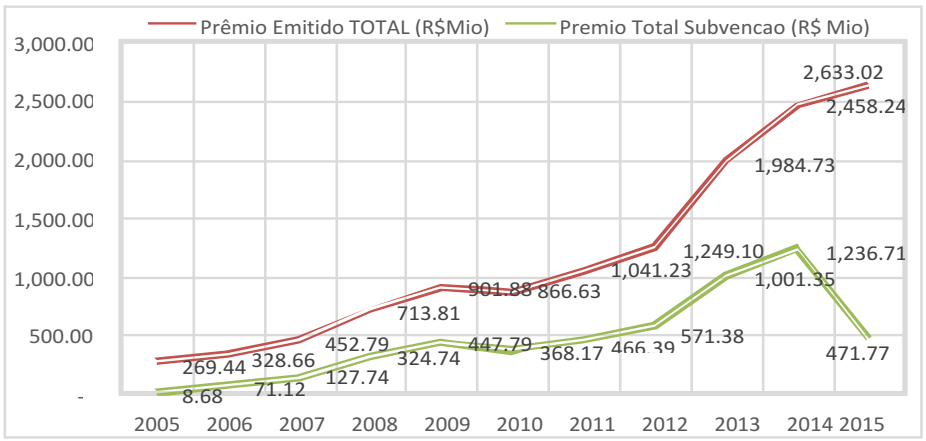
3.2 Insurance Scheme: Government Premium Subsidies Program for Agricultural Insurance (PSR)

The Government Premium Subsidies Program for Agricultural Insurance (PSR) was launched in 2003 under the Law No. 10.823 and subsequent regulations were also introduced under Decree No. 5.121) a year after. The PSR has the objective to increase the penetration rates of agricultural insurance products through reductions in the cost of insurance premiums to farmers. This program is coordinated and financed by the Ministry of Agriculture, Livestock and Food Supply (MAPA).

The evolution of the PSR program shows outstanding growth from 2005 to 2014. During this period, the premium volume moved from R$9 million to R$1,237 million. In 2015, the PSR experienced a drop in the volume of premiums (R$472 million) because of a drastic reduction in the premium subsidy funds made available by MAPA. Consequently, the share of subsidized premium

compared to market volume dropped from 50% in 2014 to 18% in 2015. Interestingly, the total premium volume of the national agricultural insurance program - carried out by the private sector- continued its growing trend (see Figure 2.2.). This situation seems to contradict the arguments made by the private insurance industry that the sustainability of the national agricultural insurance program depends on the availability of fiscal resources for premium subsidy.

Figure 2. Evolution of the Private sector Commercial Insurance (PSR). The red line shows the PSR total premium (including the subsidized premium); whereas the green line shows the volume of subsidised premium (SUSEP and MDA).



Key Issues & Challenges of PSR

A series of PSR assessment studies[22] carried out in the past revealed a number of challenges in terms of achieving the expansion of agricultural insurance products to new regions, and reaching program´s sustainability. For instance, the issuance of regulations and norms that guide the insurance industry to operate the PSR and the need to carry out technical analysis on the adequacy of coverage provided by existing products exceeds MAPA´s operational capacity.

The Secretariat of Agricultural Policy (SPA) is MAPA´s technical division in charge of the PSR´s overall operation. This unit is comprised of seven

22 For further details see Tribunal de Contas da Uniao, TCU 2014

members whose area of expertise cover agronomy and applied economics. Even though the number of SPA´s staff is similar to other technical units in Latin America, the main difference in countries such as in Mexico is that the Ministry of Agriculture (SAGARPA - Mexico) delegates the assessment of their insurance products / programs on specialized government institutions (i.e. AgroAsemex), consulting firms or academia (i.e. TEC de Monterrey University). Along with this, SAGARPA´s main responsibility is limited to the issuance of norms and make program related information available to the sector.

In addition, there is a lack of coordination among government institutions. This situation is generated because of the absence of a national risk management policy for the agricultural sector that sets up the mechanisms for data sharing and programs´ planning. The above, results in the implementation of information systems (both at the Federal and at state level) that are not always accessible, not even to public institutions; therefore, it is virtually impossible to avoid the risk of an overlap between the populations served by each institution.

Furthermore, one of the major issues raised by the private (re)insurance sector was the unpredictability of funds for the agriculture insurance premium subsidy. Since 2009, MAPA has delayed payments to private insurers despite the fact that funds were planned in advanced[23]. Similarly, MAPA did not disburse R$ 90 million in subsidies to the private insurers back in 2010. In 2011, the transfers due to the latter were as high as R$ 163 million. These liabilities shrank the resources actually available to the market in the following years. The budgetary provisions were below expectations during the same time (GFDRR 2014). This situation is even worse in 2015/16. Government PSR premium subsidy support was budgeted at R$700 million against an available amount of R$472 million. After the start of the summer crop season, the Federal Government announced it was freezing the agriculture insurance premium subsidy support, as it did not have adequate funds to make these payments. Government currently owes R$188 million to insurers and their reinsurers for the 2015/16[24] year.

It is visible the high level of inconformity that the delays in subsidy payments to private insurers and the continuous changes introduced by MAPA on PSR´s operation rules, are generating among different stakeholders. On one hand, the insurance companies complained that they had to adjust at least twice

23 Adami and Ozaki (2012)
24 FENESEG Meeting Brasilia 15 April 2016

their operation mechanisms and marketing strategies in 2015 because MAPA changed the definition of the maximum liabilities and subsidy levels without considering that the retained risk was not even expired. In such cases, some insurance companies opted to take over such costs in order not to affect farmers by also changing themselves the parameters of the policies. Whereas other companies, notified farmers to absorb the costs.

Finally, MAPA has expressed its concerns over the regional concentration of the agricultural insurance program; therefore, there is the potential for further improving agricultural insurance pricing, ex- panding coverage and reducing prices. Consequently, the PSR (agricultural insurance subsidies) could become more cost-effective[25].

25 GFDRR, 2014.

3.3 Public Sector Programs

Description of main programs

The federal government is financing a range of fully intervened and partially subsidised programs that aim to assist farmers in the aftermath of a disaster (i.e. drought). Interestingly, insurance practices have been considered to a certain extent in the design and operation of some of these programs. The aim was to set up objective parameters upon which beneficiaries could receive compensation payouts. Furthermore, some of these programs involve also the contribution from the beneficiaries, the municipalities and State Governments; and income compensation to farmers affected by disasters. Because of the above, these emergency programs are sometimes wrongly labelled as "insurance schemes". It is worth noting; however, that none of the programs described below are under the supervision of the Superintendence (SUSEP), the insurance sector is not involved in their current operation, and the cost of contributions made by stakeholders is not based on actuarially fair calculations.

PROAGRO (Guarantee Program for Agricultural Activities): This program, administered by the Central Bank of Brazil (BCB) targets small- and middle--sized crop and livestock producing units. Its objective is to exempt farmers from paying specific financial obligations (loans) in the event of an extreme climatic and natural related event that reduce farmers´ payment capability.

In 2015, the maximum amount of protection (limit of indemnity) set for any farmer was R$300,000 (about US$90,000). In order for a famer to benefit from PROAGRO´s protection, a field inspection shall be made by an Agent who should verify if the loss was due to covered causes(s). In the event the claim submitted by a farmer is approved, the minimum payment is 70% of the loss rising to 100% according to the individual beneficiary's claims record over the past 36 months.

The approved PROAGRO´s sources of funding include: (i) budgetary provision from the Federal Government; (ii) rural producers´ contributions; and (iii) revenues from financial surpluses.

"PROAGRO Mais" / SEAF: This is a financial protection coverage designed by Banco do Brazil for Family Agriculture. PROAGRO Mais targets small-sized farmers registered under the PRONAF (Programa Nacional de Fortalecimento da Agricultura Familiar). The program covers financial liabilities plus a share of the expected revenues in the event of an extreme weather event, or losses generated by pest and diseases for which there is not a widespread method of control.

The maximum amount of protection is R$35,000, and it could cover either 100% of the credit or up to 65% of the farmer´s expected revenue derived from an agricultural activity. Field adjusters from Banco do Brasil respond to loss claims and corroborate whether a farmer is entitle to receive a compensation payout.

Annex 1 shows the percentage of premium paid by each stakeholder for PROAGRO and PROAGRO Mais protection for the period 2004/05 to 2014/15. Over this period producers have paid an average premium contribution of about 2.4% of the sum insured value and equivalent to 33% of the total value of payouts made by the Fund, while Federal Government has funded 67% of the total payouts (Total claims). As such PROAGRO is heavily subsidised by government.

Programa Garantia Safra: The Ministry of Agrarian Development (MDA) designed this income compensation mechanism for family farmers who plant maize, beans, cassava, cotton and rice in the semi-arid of Brazil. The semi-arid covers a region equivalent to 981,821.9 Km2, which is an area under

the influence of the Northeast Development Superintendence (SUDENE). The target population is estimated to be 1.4 million farmers.

The Garantia Safra disburses a fixed amount (currently R$ 850) to farmers when the occurrence of a severe drought or excess of rainfall has caused crop losses above 50% of the expected yield. The crop losses are defined based on a mixed trigger mechanism: On the one hand, the National Meteorological Institute (INMET) calculate an agro-meteorological model to compute theoretical crop losses at the municipality level. On the other hand, the compensation payout mechanism also relies on the involvement of state extension officers to carry out field loss assessments.

The Garantia Safra is funded by the financial contribution from farmers, the municipalities, the nine state governments of the Northeast and the Federal Government[26].

Bolsa Estiagem: This is an income compensation program for small-sized farmers who are not enrolled in Garantia Safra. Farmers are entitled to receive fixed monthly amount of R$ 80 per month per producer in five instalments (cap R$ 400 per year) in the event there is a situation of emergency of public calamity triggered by an extreme drought. In November 2014, Bolsa Estiagem had presence in 599 municipalities and it benefited around 199,538 farmers.

Bolsa Estiagem is funded in full by the federal government and its operation is under coordination of the Ministry of Integration (MI)[27].

Key Issues & Challenges of Public Sector Programs

Government institutions face a series of technical and operational limitations on public sector programs that prevent them to achieve a better financial performance. On the one hand, neither PROAGRO, nor PROAGRO Mais nor Garantia Safra have yet established a methodology for risk pricing. As a result, parameters such as indemnity payments are often politically determined; therefore, it becomes impossible to guarantee that the financial contribution made by the stakeholders is raising sufficient funds to pay for the losses experienced by the beneficiaries due to the occurrence of a catastrophic event. Furthermore, the absence of an actuarially sound risk pricing methodology prevents government institutions from designing a risk financing strategy.

26 According to CGGM legal resolution No.1 (19/06/2015), the financial contribution per stakeholder is the following: R$17.00) per Farmer, R$51.00 payed by the municipalities for each farmer who joins the program; R$102.00 payed by state governments for each farmer who joins the program; and R$340.00 payed by the federal government for each farmer who joins the program.
27 Gutiérrez et al. (2013)

For instance, under the Garantia Safra program, representatives from the MDA estimate that making a reserve equivalent to 30% of the total compensation payout (maximum probable loss) based on R$850 per farmer, would be enough to cover all the liabilities. Although the above assumption may work for some regions, it could also under / overestimate the financial risk for others. In the same way, PROAGRO carries flat premium rates that ranges from 2% to 4% depending on farmers´ production system and the regions where the plantation are located. This compares with a required higher average premium rate to exactly cover claims payouts over the past 11 years (Annex 1).

Similar to the Premium Subsidy Program for Agricultural Insurance (PSR), public programs lack of a medium- and long-termed plan upon which the government of Brazil can allocate fiscal resources more strategically, thus ensuring a greater impact.

In the case of Garantia Safra, the number of the enrolled farmers and municipalities grew 385% and 311%, respectively, over a 10-year period (2002/2003 to 2011/2012). This growing trend has forced the national authorities to allocate an increasing amount of financial resources for its operation. Furthermore, contingent credits have been regularly approved by the Federal Government to help the Garantia Safra keep a financial equilibrium and meet its financial obligations[28].

As discussed, the information systems which have been set up for the operation of public programs are not fully integrated. As a result, it becomes challenging to crosscheck information and assess whether a farmer (or a region) is receiving a comprehensive risk management type of assistance that improves resilience to climate change. Currently, the existing information systems of public programs do not allow stakeholders to improve the financial performance of these programs; nor to design risk transfer products that address producers' real needs[29].

28 Costa et al. (2013)
29 GFDRR, 2014.

Proposal for an Integrated PPP System for Agricultural Insurance in Brazil

4

4.1 Towards an integrated National Agricultural Insurance Strategy for Brazil

Section 3 highlighted the fact that although there are a wide range of public and private agricultural insurance products and programs for different income segments of Brazilian farmers, in the absence of a national agricultural insurance plan or strategy, these programs are poorly aligned and in some cases overlap each other in terms of the client base. The lack of an integrated disaster risk management and agricultural insurance strategy is also identified as a major issue by GFDRR (2014) and EMBRAPA/WBG (2016). This problem is accentuated by the fact that agricultural risk management policies, fiscal budgets and implementation are divided up between several Ministries, MAPA (PSR) MDA (Garantia Safra, PROAGRO and PROAGRO Mais / SEAF), and MI (Bolsa Estiagem).

The first part of this Section provides an overview of options for the creation of an integrated Public Private Partnership (PPP) strategy and system for agricultural insurance in Brazil and focuses on several key components of this system including the legal and regulatory framework, institutional and operational framework. Any PPP arrangement for Brazil should include the three major stakeholders:

(i) government;
(ii) private sector financial institutions (insurance and rural banking institutions) and
(iii) producer organisations and associations.

The second part of this chapter presents options for strengthening both the private sector crop, livestock and forestry insurance program (seguro agricola) and then three public sector quasi-agricultural insurance programs: PROAGRO, Garantia Safra and FESR.

4.2 Legal and Regulatory Framework

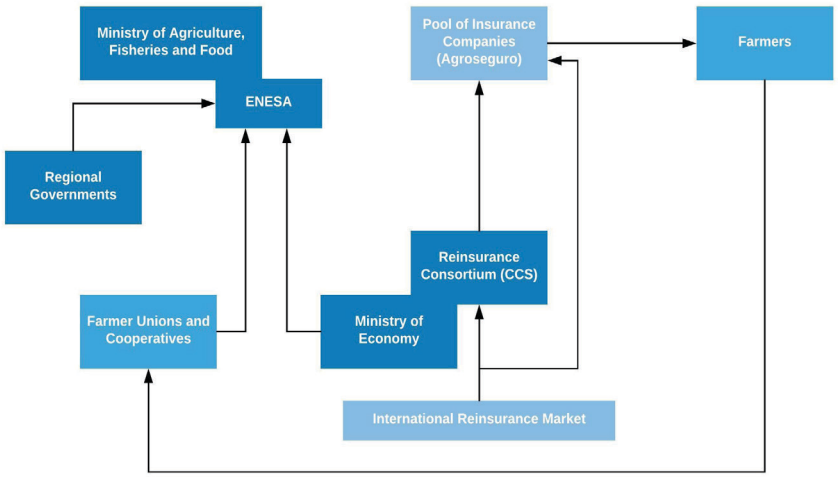
Section 3 showed that that private and public sector agricultural insurance and income compensation programs for small farmers in Brazil is governed by a wide number of laws and regulations both at federal and at state levels. However, there is no overall legal or regulatory framework to align and integrate the implementation of these programs. In the major PPP agricultural insurance programs that operate in countries such as the USA, Canada, Spain and Turkey, agricultural insurance provision is enshrined by a law that integrates the various policies and programs. The Brazilian stakeholders may wish to study the legislation and regulatory frameworks that applies in these and other national agricultural insurance programs.

In the USA, the Federal Crop Insurance Program (FCIP) is implemented under the framework of the Federal Crop Insurance Act, the Farm Bill and the Agricultural Risk Protection Plan. This legislation clearly sets out the roles and responsibilities of the private commercial insurers, crop and livestock producers eligibility for premium subsidies, governments' roles in product design and rating, the provision of subsidies and government's role in providing reinsurance protection through the Standard Reinsurance Agreement (SRA) and Livestock Price Reinsurance Agreement (LPR). Legislation also stipulates the role of the Risk Management Agency (RMA), which is a Federal agency under USDA. The RMA is responsible for approving all new crop and livestock products and programs, for maintaining a national data base of crop insurance underwriting and claims results and for advising on the actuarial rates for each crop and livestock program in each county and state.

Furthermore, RMA manages the various premium subsidy programs including (i) producer premium subsidies, (ii) subsidies to cover the Insurers' administration and operating expenses and finally (iii) subsidies on loss adjustment costs. RMA is also responsible for implementing research and development into new products and programs and for grower outreach, training and education programs. In the USA there is explicit linkage between agricultural insurance and public disaster assistance programs through the requirement that a farmer must first purchase a minimum level of catastrophe protection under FCIP to be eligible for additional disaster relief.

In Spain, the Combined Agricultural Insurance Program was created under the Law of 28 December 1978 (Ley 87/1978, de 28 de diciembre, de Seguros Agrarios Combinados). It is a national PPP agreement between national and regional governments, producer associations and interested insurers to underwrite subsidised voluntary agricultural crop, livestock, forestry and fisheries (aquaculture) insurance. The program is a Pool program which is underwritten by a managing underwriting company AGROSEGURO on behalf of about 28 private and mutual insurance companies and the national catastrophe reinsurer Concorcio de Compencacion de Seguros, CCS. The 1978 Insurance Act led to the creation of the State Agricultural Insurance Agency (Entidad Estatal de Seguros Agrarios, ENESA) which is responsible for drawing up the three year and annual combined agricultural insurance plan and budget in conjunction with the regional governments and producer associations and then in advising government of the funding requirements. ENESA is also responsible for insurance program design and the setting of rates with the AGROSEGURO underwriters and then in administering the premium subsidies. (See Figure 4.1. for further details).

Figure 3. Spain Combined Agricultural Insurance Program, PPP Institutional Framework



In Turkey, the Turkish Agricultural Insurance Pool (TARSIM) was established by Law No 5365 in 2005. The law covers the establishment of the Pool, the risks to be insured by the Pool, the Pool's income and expenses, government support in the form of premium subsidies and excess of loss reinsurance support, insurance contracts, the contracting of reinsurance and the principle duties of the pool operating company and the coinsuring members. Additional legislation which governs TARSIM's operations is set out on the Regulation of the Application of the Agricultural Insurance (No 26172, 18 May 2006) and the Agricultural Insurance Pool Operating Procedures and the Principles of the Agricultural Insurance Regulations (No 26172, 18 May 2006).

Based on international experience, Brazil needs to introduce new legislation to support the PPP on agriculture insurance in order to: (i) establish an integrated agricultural risk management framework based on PPP principles, aligning the various public and private agricultural insurance programs; and
(ii) reform some of the ex-post disaster income compensation fund programs under a structured risk financing program involving, both traditional indemnity based and new parametric crop and livestock insurance programs. Reforming the various laws, regulations, and the government's role and operations of the various programs, represents a major medium-term undertaking and which would ultimately need to be approved by congress. Some of the key areas which new insurance legislation should seek to cover are listed below:

1. Definition of PPP objectives, and the roles and responsibilities of the key public and private sector stakeholders and to establish the organisational and operational framework for such the PPP agricultural insurance program.

2. Specification of the linkages and alignment of the various public and private sector agricultural insurance programs.

3. Definition of the norms applying to premium subsidies and to other forms of government financial support and the budgeting and allocation processes.

4. Provision of a legal framework for the establishment of a national agricultural insurance data and information collection, storage and processing facility.

5. Creation and regulation of a strengthened Technical Support Unit (TSU)/ Risk Management Unit for Brazil which would ideally build on the existing Departamento de Gestão de Risco e Recursos Econômicos of the Secretariat

of Agricultural Policy (SPA) which is housed in MAPA. Some of the possible expanded functions of the strengthened SPA unit may include actuarial and rating studies, product design and rating, establishing a centralised agricultural insurance data and information centre, which would build on the existing Agricultural Insurance Atlas data base system that SPA has established to manage the premium subsidy program (PSR).

4.3 Institutional and Operational Framework

Under any potential reforms of the Brazilian agricultural insurance market and strengthening of the PPP, it will be necessary to consider a more cost-effective organisational and operational framework. Internationally, the most common forms of PPP frameworks are:

1) A flexible PPP framework under which individual companies are approved by government to underwrite subsidised crop and livestock insurance policies and to access subsidies on behalf of the farmers they insure. These authorised companies then compete against each other for business either adopting uniform agricultural insurance policies and rates, or offering their own products and own rates. This flexible, individual-company, PPP structure is the most common model encountered in countries such as the USA, China, Japan, South Korea, Italy, Mexico, Chile, and Brazil.

2) A Pool structure whereby interested insurance companies agree to establish a Pool Insurance Company to underwrite the risk. The World's largest national agricultural insurance pool PPPs are found in Spain (Agroseguro) and in Turkey. Some of the key advantages of a Pool include:

a. Individual companies have limited ability to retain risk and pooling enables greater local retention;
b. Economies of scale in terms of start-up and fixed and variable operating costs;
c. Reduced cost of reinsurance due to risk diversification (pooling effect);
d. Ability to maintain uniform underwriting standards and premium rates;
e. Coordination of government support and services is much easier when dealing with one single pool entity rather than large numbers of competing

agricultural insurance companies. The main drawbacks of pools centre on reduced competition and choice, especially on market premium rates.

In the case of the subsidised private commercial agricultural insurance program for medium and large crop and livestock and forestry producers in Brazil, it is highly unlikely that the existing 10 to 12 registered companies would be interested in forming a pool to underwrite this business.

If the GoB were to decide to reform the public sector's quasi-agricultural insurance programs such as PROAGRO, Garantia Safra, Bolsa Estagiem, and to turn them into private sector underwritten agricultural insurance programs, it will need to consider carefully the optimal insurance and reinsurance structuring arrangements. There are several options for government to consider:

a) To place these programs with a single insurance company and to use an annual tender process to appoint the company which is granted the order for these programs;

b) To adopt a similar procedure to the Mexican CADENA program whereby individual companies compete for individual programs on a State-by-State basis each year. While this encourages market competition, the main drawbacks of implementing PROAGRO, Garanta Safra and Bolsa Estagiem on a State-by-State basis through individual companies would be: (i) maintaining common standards of underwriting and claims adjusting; (ii) the potential duplication of underwriting and claims management systems and procedures by each company in each State leading to much higher administration and operating costs; and (iii) the inefficiency of each company placing its own State-level reinsurance program;

c) To promote a "pool program" for these public-sector programs and to encourage as many registered private agricultural insurance companies as possible to join the pool programme. This third approach would offer potential benefits in the form of: (i) centralised product design and risk rating and standardised underwriting practices (ii) economies of scale through operating one underwriting and claims management unit; (iii) increased pool retention; and (iv) cheaper reinsurance due to the effect of pooling of risk / better risk spread. It would also be easier to provide a multi-year deal (for example 3 to 5 years) to the pool insurers to encourage them to invest in infrastructure, staffing, operating systems and procedures.

The possibility of consolidating the PROAGRO, Garantia Safra and Bolsa Estiagem programs into a stand-alone risk pool managed through risk retention or risk transfer schemes is also recommended by GFDRR (2014).

4.4. Strengthening the PSR

There are a series of key issues relating to the design and operation and budgeting and settlement of the PSR that require urgent reform and strengthening. These issues are considered from the perspective of government and the private sector insurers.

MAPA's concerns:

1. MAPA needs to represent the government's interests and to ensure that the premium subsidies are allocated and spent in the most cost-effective way. MAPA therefore seeks to ensure that the commercial premiums charged by insurers and on which basis the premium subsidies are applied are actuarially fair and have sustainable prices for the three main stakeholders: farmers, insurance companies and government;

2. MAPA has full access to the underwriting of agricultural insurance risks (by Insured policy holder) for all insurance companies, and therefore it can monitor trends in commercial premium rates by company, by crop, by coverage level and by municipality on a seasonal basis. MAPA is concerned about the major differences in premium rates charged by individual companies for essentially the same crop insurance products for the same crop in the same location (risk zone). The above leads MAPA to question whether some companies are not using actuarially determined rates, but rather are seeking to exploit the premium subsidy regime.

3. MAPA has a perception that at a market level, agricultural insurers are extracting excessively high profit margins on subsidised crop insurance business and this concern applies specifically to the crop MPCI portfolio, which accounts for more than 80% of the total book of subsidised agricultural insurance. However, as the insurance companies are not obliged to share their detailed risk-by-risk agricultural insurance results to MAPA, it cannot analyse and prove whether this concern is correct.

Options for MAPA to consider:

1. Increasing market transparency and competition. In 2016, MAPA launched an on-line "Atlas do seguro rural" which is a database of agricultural insurance underwriting data since 2005. This database enables any interested party, including farmers, to check the current and historical average commercial premium rates charged by individual company and to select that company which currently offers the most competitive subsidised premium rates. In a fully competitive market, this free access to information would, in the medium term, act to drive down prices. To achieve this objective, however, the database needs to include statistics for the entire agricultural insurance market and not only to the subsidised agricultural insurance premium share.

2. A further option MAPA could consider the publication by government of Commercial Premium Reference Rates (CPRR), which act a ceiling for the calculation of premium subsidies. Such a system does not prevent a company from choosing a higher or lower premium rate. Portugal has operated such a system of CPRRs for more than 30 years under its Integrated System for the Protection of Climatic Perils (Sistema Integradade Protecao contra as Aleatoriedades Climaticas);

Concerns of Private Agricultural Insurance Companies:

The commercial insurance companies and their international reinsurers share a series of key concerns over the current operations of the PSR premium subsidy regime which were highlighted in Section 3 and which centre on:

1) the frequent changes in the rules and regulations applying to the operation of the premium subsidy regime, including the subsidy levels applicable to each product line and coverage level and the annual subsidy limits per program and per farmer (See Table 4.1. for the current premium subsidy levels that apply for each agricultural sector/product line),

2) the lack of stability in Federal Government's premium subsidy budget and the fact that changes in the budget allocation may only be announced after policies have been issued and farmers are on risk.

3) The fact that government frequently does not have available financial resources to settle the premium subsidies on time and Insurers and their Reinsurers often face many months delays in receiving their premium subsidies. In the meantime, insurance legislation obliges insurers and their reinsurers to settle claims within 30 days maximum from the time of adjusting the loss.

Table 2. 2015/16 PSR Premium Subsidy levels and Maximum Limits (SPA/MAPA, 2016)

Modalidades de Seguro	Grupos de atividades	Tipo de cobertura	Nível de cobertura	Subvenção (%)	Limites anuais (R$)
Agrícola	Trigo[1]	Multirrisco	> 60%	55%	R$ 72 mil
	Grãos	Multirrisco	60% - 65%	45%	
			70% - 75%	40%	
			> 80%	35%	
		Riscos Nomeados[2]		35%	
	Frutas, Olerícolas, Café e Cana-de-açúcar	----	----	45%	
Florestas	Silvicultura (Florestas plantadas)			45%	R$ 24 mil
Pecuário	Aves, bovinos, bubalinos, caprinos, eqüinos, ovinos e suínos				R$ 24 mil
Aqüicola	Carcinicultura, maricultura e piscicultura				R$ 24 mil
VALOR MÁXIMO SUBVENCIONÁVEL (CPF/ano)					R$ 144 mil

[1] Exclusivamente até 31/12/2016
[2] Incluindo trigo
Fonte: SPA/MAPA

The commercial insurers are seeking to strengthen the PSR subsidy regime by requesting that the budget and terms and conditions are drawn up on a biannual basis and that any changes are advised by government at least 6 months before the start of the new agricultural insurance calendar to enable the insurers to build these changes into their marketing and underwriting campaigns. Furthermore the insurance companies are seeking guarantees from Government to settle the premium subsidies within 30 days of submitting their accounts and proof of the bound risks and premium paid by the farmer/policy holder and the amount to premium subsidy due from government (For further details see Tribunal de Contas da Uniao, TCU 2014).

4.5 Strengthening data & Information Systems

The enhancement of the existing agricultural risk management framework and in particular to the agricultural insurance program begins with the design and implementation of a comprehensive information system that collects relevant data and information. In the context of agro-meteorological data, a useful first step would be to promote the integration of federal and state weather station networks to improve the spatial and temporal resolution of weather variables. EMBRAPA has made important progress in this respect.
For instance, the Agro-meteorological Monitoring System (AGRITEMPO[30]) enables WEB users to have access to agro-meteorological information at the municipality level. Furthermore, this system is a critical component to update the agricultural risk zoning data (ZARC), which is a risk management tool upon which public programs are implemented.

Given that a consistent, long-termed, high quality weather data can be used to characterize weather hazards, design index-based products and risk pricing; future efforts to make historical raw and filled- in weather records available to the public and to the insurance industry in particular should take an incremental approach. In 2016, the World Bank is providing financial support to develop a Consisted, Filled and Spatialized Meteorological Database (COMPRESS). This system, also planned to be managed by EMBRAPA, is expected to reduce the amount of time spent by public institutions to run weather data quality control procedures, and data fill-in processes. In addition, COMPRESS database

30 https://www.embrapa.br/en/busca-de-produtos-processos-e-servicos/-/produto-servico/49/agritempo

will enable MAPA to expand new municipalities where ZARC is not currently available. Finally yet importantly, COMPRESS database could help MAPA make more thoughtful decisions about the risks to be covered under a national premium subsidy scheme.

4.6 Reforming Garantia Safra with WRSI (Case Study)

As discussed, the Garantia Safra is a risk compensation program that operates based on two different, but complementary, payout mechanisms. On one hand, the Water Requirement Satisfaction Index (WRSI) is computed by MDA (now Secretaria de Desenvolvimento Agrario - SDA) with the aim of estimating theoretical crop losses at the municipality level. Given that the WRSI´s outputs do not always match with the actual losses registered at the municipality level nor farmers´ loss assessments.

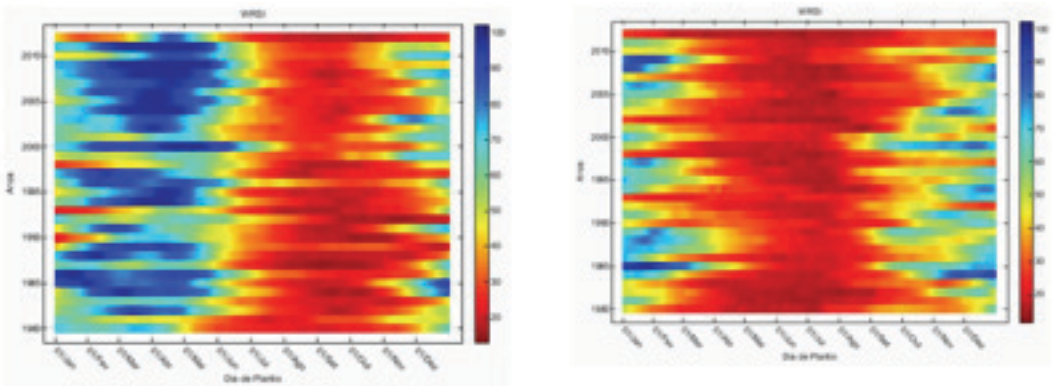
The way Garantia Safra is designed, it presents a number of important challenges for its operation and financial performance, including the fact that the Government absorbs all the financial losses and during extreme years the program exerts more pressure on itself to approve extraordinary budget allocation.

When the financial contribution made by the stakeholders is insufficient to meet its obligations, the federal government has to intervene with the approval of contingent credits. For the period 2006-2013, for instance, contingent credits have exceeded by 160% on average the amount budgeted. In four out of the eight years that were analysed by the Costa et al. (2013), the extraordinary budgetary allocation was at least twice the amount budgeted.

Further to the full implementation of the Consisted, Filled and Spatialized Meteorological Database (COMPRESS), a risk transfer instrument could be designed based on the use of WRSI values to reduce government´s fiscal exposure to extreme drought events. However, it is worth noting that the overall cost of an insurance would be extremely expensive if the Garantia Safra portfolio only concentrates in the semi-arid region. Therefore, it would be useful to consider the expansion of the program also to other less risky regions.

In case the current fiscal constraints prevent the national authorities to expand Garantia Safra to new regions, COMPRESS database can still help improve the program´s financial performance. The above could be achieved through the identification of those municipalities where financing risk mitigation activities could be more cost effective than purchasing a risk transfer instrument. For instance, the computation of daily WRSI values for Maize in two municipalities benefited from Garnatia Safra shows that planting in Petrolina (Figure 4.1.b) is extremely risky without irrigation. In contrast, farmers in Campina Grande (Figure 4.1.a) are more likely to succeed when planting maize in rainfed conditions than in Petrolina.

Figure 4. Calculation of daily WRSI values for maize in two municipalities of the semi-arid region. The dataset corresponds to the period 1980-2013 (a and b).



NOTE: Yellow and Red WRSI values denote 50% or less of crop expected yield.

4.7 Reforming PROAGRO and PROAGRO Mais with AYII

Section 3 highlighted a series of drawbacks about the existing PROAGRO/ PROAGRO MAIS Programs including: (i) the fact that the program is not actuarially rated and priced; (ii) the inadequate level of contribution to the Central

Bank of Brazil's Compensation Fund to finance expected losses in normal and catastrophe years as shown by the premium and claims analysis in Annex 1; (iii) the lack of reinsurance and its fiscal exposure to catastrophe loss (as evidenced in 2011/12 which was a very severe drought year and when total claims exceeded R$1.1 billion); and (iv) the marketing of individual insurance cover and adjusting of claims is time consuming and some farmers do not understand the basis of indemnity on this quasi agricultural insurance program.

This section raises the question whether PROAGRO/PROAGRO Mais could be strengthened by the introduction of a formal agricultural insurance program using appropriate and affordable crop insurance products for smallholder crop producers - in this case Area Yield Index Insurance (AYII) and by placing the program with commercial insurers and their reinsurers either individually or as part of a Pool program as recommended above. This product can also be explicitly linked to, or bundled with, seasonal crop lending through the financial sector (Banks, MFIs etc).

Rationale and Features of Area Yield Index Insurance (AYII)

Individual grower subsidised MPCI was introduced a decade ago in Brazil under the Seguro Agricola program and it has been widely adopted by the banks as a bundled crop-credit insurance product for medium to large commercial farmers. However, traditional MPCI, as a product for smallholder farmers (between 5 to 20 Ha of grains and oilseeds) has not been successfully implemented in the world by insurers because of the very high costs associated with conducting pre-inspections, mid-season inspections and finally in-field measurement of crop yields at the time of harvest. Furthermore, few smallholders maintain accurate records of their historical crop production and yields and on which basis to calculate the long-term average yield (LTAY) and to then establish an insured yield guarantee as a percentage of the LTAY and to price the cover.

There has been considerable interest in developing alternative drought insurance products that are more suited to smallholder farmer needs and in this case there are two basic options (a) a Weather Index Insurance (WII) policy; or (b) an Area Yield Index Insurance (AYII) policy. WII has received a great deal of attention in development circles in the past 15 years as a smallholder product, but very few programs to date have achieved scale and sustainability and the product has often encountered severe basis risk. WII usually insure against

one or two weather related perils such as excess rain (leading to waterlogging and flooding) or rainfall deficit (drought), but does not necessarily provide smallholders with comprehensive loss of yield protection.

Area Yield Index Insurance (AYII) is a multiple peril loss of yield cover which affords a much broader range of protection against crop yield losses due to natural, climatic and biological (pests & diseases) perils, than provided by a WII policy. The key feature of an AYII policy is that it insures farmers for losses against an average area yield ("the index") in a defined geographical area termed the Unit Area of Insurance (UAI). As such, AYII does not insure against production or yield losses in individual farmers' own fields. The cover works best for systemic risks (such as drought or frost) which affects in a similar way on the production and yields of all farmers in the UAI. AYII does not work well where idiosyncratic risk is the main exposure - for example hail, which can result in highly localised losses and which would not be picked up at the area average yield level. (See Annex 2 for further discussion of the features and advantages and disadvantages of AYII and options for Brazil).

AYII has been commercially implemented for more than 40 years and major markets include India (where the product has been implemented as a bundled crop-credit insurance cover) the USA where the product is known as Group Risk Plan and Canada and Mexico (See Annex 2 for further review of international experience with AYII).

Brazil has a rich experience with the operation of AYII which dates back to 2001 under a public-private partnership between the state government of Rio Grande do Sul, local insurers and international reinsurers. The AYII cover known as the Group Risk Municipality (Grupo de Risco Municipalizado, GRM) Program was linked to the State Government maize seed swap program[31] aimed at introducing new hybrid maize and was a voluntary individual farmer crop insurance program, which attracted high state premium subsidies of about 90% of the cost of the premium. The program operated between 2001/02 and 2007/08 and insured a total of 198,000 smallholder maize farmers over this period. The AYII program was terminated at the end of the State Government's subsidised seed swap program and when it also withdrew its premium subsidy contributions (Annex 2 provides further information on the GRM Maize program).

31 Programa Troca Troca de Sementes (PTTS)

Key Requirements for the Operation of AYII Insurance and considerations for Brazil

In order to operate successfully an AYII program, there are three main preconditions including:

i. the ability to define Unit Areas of Insurance (UAI), or geographical areas with relatively similar agro-climatic conditions and where farmers use similar technology and achieve similar crop production and yields;

ii. for each UAI to obtain official historical crop area, production and yield per hectare records for a minimum of 10 to 15 years or more and on which basis to construct and rate the "Area yield index", and

iii. to have an independent, accurate, timely and cost-effective methodology for measuring the actual average area yield in each UAI at the time of harvest and on which basis indemnity payments are made if the actual average area yield falls short of the Insured Yield guarantee level or coverage level.

In Brazil, the previous GRM program in RGS used the IBGE national system for crop area, production and yield reporting based on the Municipality as the most disaggregated unit for official reporting purposes. Therefore the UAI was defined as a single Municipality and any farmer whose farm fell within the boundaries of the Municipality was protected under an area yield index based on the average yield for the named crop in that municipality.

Annex 2 presents a review of the advantages and disadvantages of using IBGE time-series yield data to construct the crop yield indexes at municipality level and then the IBGE current season system of estimating actual average yield. The annex also reviews alternative objective in-field sample crop cutting procedures to estimate area average yields. Annex 2 also presents a worked example of an AYII cover for soya grown in Londrina Municipality Parana State using IBGE time-series official yield data.

Recommendations and Next Steps

In order to strengthen the PROAGRO (and PROAGRO MAIS) programs by evaluating the potential for introducing AYII, the next steps would be:

1. to conduct a formal review of the PROAGRO program and its strengths and weaknesses and options for transforming this into a formal AYII program;

2. to conduct a feasibility study for the design and implementation of an AYII program for PROAGRO, starting with selected crops in selected regions and municipalities where PROAGRO operations are currently concentrated;

3. to examine issues relating to basis risk which cannot be protected against under an AYII cover and to consider options, which might include a basis risk or contingency fund;

4. to conduct a cost-benefit analysis of the AYII program compared to the current PROAGRO;

5. to conduct a study into the options, issues and costs of introducing CCE based area yield estimation to speed up the process of settling claims and to introduce an audit trail for AYII insurance;

6. to conduct a legal and regulatory assessment with the Insurance Regulator to ensure the AYII program complies with the insurance legislation;

7. assess converting its fund contributions from PRAGRO to providing premium subsidy support to the new AYII program.

4.8 Reforming the Fundo de Estabilidade do Seguro Rural (FESR)

FESR was created under the Decree-law nº 73, of November, 21st, 1966 and is managed by IRB. It is designed to act as a stabilizing fund that provides participating insurers with stop loss reinsurance protection if their agricultural insurance claims excess 100% up to 150% loss ratio, or 250% to 350% loss ratio. Insurance claims excess of 150% up to 250% of premium and then excess of

350% of premium are retained by the insurance companies and/or protected by their commercial reinsurance contracts.

FESR is funded by a 30% charge levied on the annual profits on rural insurance operations. Where claims to FERS exceed its accumulated reserves the Federal Government is liable to cover the deficit.
In the mid 2000's FESR funds were completely depleted by the huge losses incurred by CORESP and which led to the company being closed down. Since then it is understood that BBMapfre is the only registered agricultural insurer in Brazil which continues to subscribe to FESR and all other companies prefer to place their reinsurance contracts with IRB and local and international reinsurers. According to the Law 137/2010, the FESR will be substituted by the Catastrophe Fund (Fundo de Catástrofe) once the latter mechanism is created.

Catastrophe Fund (Fundo de Catástrofe)

The Catastrophe Fund was approved in 2010, but is not yet operational due to the lack of regulation. The idea is to replace the FESR in a way that allows the private sector to participate in the fund. The initial proposal indicates an initial investment of R$2 billion from Federal Government budgetary resources and R$ 2 billion from bond issues. Legal framework: Complementary Law No. 137, August.

Future Role of FESR/Catastrophe Fund

FESR was created in an era when the Brazilian insurance market was essentially closed to foreign competition and was reinsured solely by the Brazilian national reinsurer, IRB (Insituto Brasileiro do Reaseguro). Agricultural reinsurance capacity at that time was highly restricted and the FESR performed an important role in protecting the public sector agricultural insurance programs such as Proagro and COSESP. There was no private commercial agricultural insurance in Brazil back then.

Since 2007, the market has been liberalised and there are now 10 locally registered foreign reinsurers and non-domiciled international reinsurers are also permitted to compete with IRB in the market. All the major international agricultural reinsurers operate in the Brazilian market and about 80% of all subsidised SPR business is ceded to them.

Agricultural reinsurance capacity is no longer an issue on commercial agricultural insurance lines in Brazil and this raises the question whether there is a need for Federal government: (a) to underwrite excess losses on FESR; and (b) to fund the Catastrophe Fund. Rather, these funds might be allocated more cost-effectively to supporting a structured risk-financing layer on the reformed public-sector agricultural insurance programs (Proagro, Garantia Safra etc).

André May / Embrapa

Conclusions

5

The federal government has been very active in supporting the development of the agricultural insurance market in Brazil. Government support to public and private agricultural insurance programs has taken various forms ranging from: (i) the design and implementation of information systems; (ii) the issuance of norms and regulations specific for different target farmers and regions; and (iii) the operation of an agricultural insurance premium subsidy program. As a result, the agricultural insurance provision has expanded not only in terms of the total area insured; but also it has set foundations for market innovation.

Although the government´s policies for supporting the agricultural insurance market have played an important role in the provision of risk financial protection to farmers over the last 10 years, there appear to be major opportunities to develop the Public-Private-Partnership for agriculture insurance and to use risk transfer instruments (such as index insurance) to fund income compensation programs for family farmers. The current situation of fiscal constraint can be turned into an opportunity for exploring new mechanisms to leverage private sector participation for increased coverage and impact of agriculture insurance policies and programs.

However, it becomes imperative that the development of the agricultural insurance market be carried out under a national integrated agriculture risk management (ARM) strategy, with the eventual development of a national policy. This strategy is expected to strengthen roles of government, private insurers and other stakeholders under a PPP. Furthermore, it would set the foundations for stronger mechanisms to define budgetary priorities, and achieve greater impact on target beneficiaries. The summary of recommendations towards achieving such a strategy include:

- Assessment of current budgetary expenditures towards agriculture risk management programs (price coverage and insurance) in order to have a base line for improving the efficiency and effectiveness of public investments. The estimates of more than 1/3 of the budget are from secondary sources from 2013.

- Assessment of the impact of current agriculture insurance policies and programs. This assessment would include the economic and social impact on farmers, but also the fiscal impact in terms of forgone fiscal expenditures in

emergency response and maintenance of fiscal revenue levels coming from the sector. It is imperative, therefore, that a series of insurance program indicators are defined in advance with the aim of measuring the effectiveness of insurance programs on reducing fiscal exposure against extreme events, thus monitoring their effectiveness as public policy tools.

- Improving access to and quality of information systems in order to be able to characterise, assess and quantify agriculture risks. This will have a significant impact on I&D of new agriculture insurance products, but also provide estimates for public sector about the level of exposure of public sector programs and fiscal liabilities. Such actions could begin by the creation of a Technical Support Unit that would join technical staff from different institutions in providing the data and assessments for public and private agriculture risk decision making.

- Develop a basic structure for a Public Private Partnership. This initial agreement can include basic principles and institutions to be created (such a National Agriculture Risk/Insurance Council or similar) to discuss the entire set of public sector programs, agree on the basic strategic pillars of a national policy, and next steps towards achieving and formalizing that PPP framework.

- Work towards integrating and improving the public sector programs. A set of specific program improvements already exist for PSR, PROAGRO, GSR, and Bolsa Estiagem. Also, integrating programs can be done in the short term, breaking down the silos that exist between MAPA, Central Bank and MDA.

The above points would need to be underpinned by a new legal, regulatory and institutional framework, as well as a sharp focus on improving efficiency and effectiveness of fiscal resources, without necessarily increasing the budget allocated to existing programs.

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6

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TECHNICAL ANNEXES

The technical annexes can be found in the following we site:
http://www.worldbank.org/pt/country/brazil/brief
brazil-rapid-agriculture-risk-management-review