ISET POLICY INSTITUTE

REGULATORY IMPACT ASSESSMENT ON CROP INSURANCE REFORM IN GEORGIA

FINAL

USAID GOVERNING FOR GROWTH (G4G) IN GEORGIA

Thursday, December 17, 2015

ISET POLICY INSTITUTE

FINAL REPORT

USAID GOVERNING FOR GROWTH (G4G) IN GEORGIA
CONTRACT NUMBER: AID-114-C-14-00007
DELOITTE CONSULTING LLP
USAID | GEORGIA
USAID CONTRACTING OFFICER'S REPRESENTATIVE: REVAZ ORMOTSADZE
AUTHOR(S): ISET POLICY INSTITUTE
WORK PLANNING:
LANGUAGE: ENGLISH

DATA

Reviewed by: David Gvenetadze, RIA and M&E Advisor; Nino Chokheli, Component Lead

Project Component: G4G Capacity Strengthening

Practice Area: Public Consultations

Key Words: Crop Insurance, Regulatory Impact Assessment, Pilot Scheme, Costs, Benefits

December 3, 2015

DISCLAIMER:

This publication was produced for review by the United States Agency for International Development. It was prepared by Deloitte Consulting LLP. The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

ACRONYMS

APMA	Agricultural Project Management Agency
APRC	Agricultural Policy Research Center
BFC	Business & Finance Consulting
CBA	Cost-Benefit Analysis
CENN	Caucasus Environmental NGO Network
GFA	Georgian Farmer Association
GIA	Georgian Insurance Association
GOG	Government of Georgia
G4G	Governing For Growth
ISET	International School of Economics at Tbilisi State University
ISET-PI	The ISET Policy Institute
KFW	KfW Entwicklungsbank (German Development Bank)
MFI	Micro-Finance Institution
MoA	Ministry of Agriculture of Georgia
MoF	Ministry of Finance of Georgia
NAGIS	National Agricultural Insurance Scheme for Georgia
NARMA	National Agricultural Risk Management Agency
PAFAI	Promoting Access to Finance and Agri-insurance for Agricultural Value Chain Actors
RIA	Regulatory Impact Assessment

CONTENTS

I. EXECUTIVE SUMMARY

The Government of Georgia (GoG) intends to create a national agricultural insurance program to achieve the following objectives: (i) developing the agricultural insurance market in Georgia; (ii) supporting agricultural production and increasing the competitiveness of farmers; and (iii) supporting the income of people involved in agricultural activities and minimizing their risks. Two pilot projects were implemented in 2014 and 2015, which on average subsidized 94% and 55% of insurance premiums, respectively. Along with these pilot projects, the government has initiated the development of a sustainable long-term crop insurance policy and regulatory framework. In the near future, it is expected that the government will decide on a model that will be used to manage the agricultural insurance process in Georgia.

A number of actors will be affected by this policy intervention. These include farmers, insurance companies, the Georgian Insurance Association (GIA), and the Agricultural Projects Management Agency (APMA) of the Ministry of Agriculture (MoA). For our study, we consulted each of these stakeholders by conducting interviews, focus groups and workshops. The consultations started on 24 June and ended on 13 August 2015.

The consultations confirmed that the Georgian agricultural insurance market is facing substantial organizational, technical and economic constraints. A regulatory framework for the market has not yet been developed and the technical capacity for administering agricultural insurance (e.g., loss adjustments and distribution of policies) is underdeveloped in the country. The availability of farm and weather data is extremely limited in Georgia, constraining the development of insurance products. In addition, Georgian farmers lack awareness of and experience with agricultural insurance, making them reluctant to insure their production. All these constraints lead to very low levels of interest among insurance companies to invest in this sector. In addition, certain climatic events, such as droughts or floods, are associated with systemic risks that can generate large losses for insurance companies, which further lowers their interest in entering such markets. Therefore, in the absence of any intervention, insurance markets will operate at a less than socially-optimal level of risk transfer.

The absence of a well-functioning agricultural insurance market negatively affects the country's development perspectives at different levels. In the absence of agricultural insurance, natural disasters (hail, stong winds, floods, frost, and droughts) can cause significant crop losses for farms, increasing the financial vulnerability of farm households and, more generally, increasing uncertainty for all agents engaged in agricultural activities. In such a context, investments that might increase agricultural productivity are more likely to be delayed, with negative consequences on income growth. This situation also has a negative impact on the public budget, as the government has to reserve funds for disaster relief payments and spend more in order to support vulnerable households. Transferring some of the farmers' risk to the insurers would help reduce uncertainty in the agricultural sector, leading to lower farmer vulnerability, encouraging investments and, ultimately, leading to higher growth. It would also allow the government to free the financial resources previously set aside for disaster relief payments and allocate them to more productive uses.

In our study, we analyzed two policy options:

- Option 1 (Baseline Scenario): the government continues with the current pilot project of agricultural insurance. APMA will manage the program.

- Option 2 (Alternative Scenario): the government establishes the National Agricultural Risk Management Agency (NARMA) – a public-private partnership in which the organization and management of the national agricultural insurance scheme will be distributed among public and private actors.

We compared the two options across a number of different dimensions, adopting a multi-criteria approach based on both quantitative and qualitative analysis.

Table 1 provides a summary of the main results of our analysis. Based on just the net present value (NPV) of the incremental net benefits, Option 2 (establishing NARMA for managing the insurance program) should be preferred to Option 1 (a continuation of the pilot project, managed by APMA). Although these quantitative results fail to include many potential impacts that could not be quantified due to insufficient data, these can be partially predicted based on economic theory and on the existing evidence from other countries. The costs associated with Option 2 are in fact investments in the development of the Georgian insurance market, potentially affecting variables such as the diffusion of insurance culture, improvement in the quality of the services provided, an increase in public confidence in agricultural insurance, providing a stable framework of public support, and reducing uncertainty for the agents. Each of these variables have been identified by our analysis as being crucial for achieving the long-term government goals. Moreover, thanks to the more dynamic and proactive approach envisioned in Option 2, it is likely that the negative impact of this option on the public budget might be smaller than predicted by our (conservative) estimates.

Considering the "Effectiveness 1" criteria (achieving general objective 1: Development of an agricultural insurance market in Georgia), we gave a slightly better score to Option 2. As a center with methodological knowledge and extensive databases, NARMA will be more efficient in improving the technical capacity of loss adjusters and other stakeholders (people responsible for product development and delivery). This will imply the accumulation of positive experiences and will build trust across all stakeholders.

With regard to the "Effectiveness 2" criteria (achieving general objective 2: Supporting agricultural production and increasing the competitiveness of farmers and agro business), we found that both options have similar performance. Larger areas under insurance will contribute to an increased value of agricultural production. Option 2 results in a slightly higher amount of insured land.

With regard to the "Effectiveness 3" criteria (achieving general objective 3: Supporting the incomes of people involved in agricultural production and minimizing their risks), we gave a better score to Option 2. Agricultural insurance is expected to reduce the income volatility of farmers. Although both options will contribute to this impact, the number of insured farmers is estimated to be higher in Option 2 – hinting at the potentially higher impact of Option 2 for smoothing farmers' income fluctuations.

As for the other criteria employed, Option 2 was found to be superior to Option 1 with regard to minimizing risks the and maximizing collateral benefits associated with the reform. At the same time, Option 2 seems to be as easy to implement as Option 1. Even though Option 2 is associated with establishing a new institution (and a possible "green field" risk exists), in the long run it might cope better with the growing complexity associated with management of the program, monitoring the quality of loss adjustment and developing properly priced insurance products.

Table 1. Comparison of options

EVALUATION CRITERIA	OPTION 1 (Pilot with Fixed Subsidy Level)	OPTION 2 (NARMA with Decreasing Subsidy Level)	OPTION 1* (Pilot with Decreasing Subsidy Level)	OPTION 2* (NARMA with Fixed Subsidy Level)
Benefits – costs (NPV)	-89,341,237 GEL	-65,504,792 GEL	-67,195,728 GEL	-71,879,478 GEL
Effectiveness 1	+ +	+ + +	+ +	+ + +
Effectiveness 2	+	+	+	+
Effectiveness 3	+ +	+ + +	+ +	+ + +
Feasibility / Ease to comply	+ +	+ +	+ +	+ +
Minimization of risks associated with the reform	+ +	+ + +	+ +	+ + +
Maximizations of collateral benefits associated with the reform	+ +	+ + +	+ +	+ + +
SUMMARY	**+ +**	**+ + /+ + +**	**+ +**	**+ + /+ + +**

Note: Option 1 and Option 2 are the major options, whereas Option 1 and Option 2* show the results of sensitivity analysis.*

Considering the evaluation criteria employed, Option 2 is slightly superior to Option 1. However, the final choice depends on the priorities of the government. If small farmers and government cost saving are the priorities, then Option 2 is superior to Option 1. However, if the main priorities are to ensure large benefits for large farmers and insurance companies, then Option 1 might be considered superior.

Therefore, our conclusion is that the introduction of a public-private partnership might have higher potential for the long-run development of the agricultural insurance market in Georgia. However, this is conditional on the willingness of all parties involved to commit to this long-run process and invest the required resources (financial and intellectual). In the absence of such willingness, the potential benefits of a PPP could shrink below the expected costs, making a "leaner" solution like Option 1 preferable.

The main policy recommendations of this study are summarized below:

1. **A long-term commitment** of **all stakeholders** is crucial for the development of the agricultural insurance market in Georgia. The **government** has to take the **lead** in this process, engaging all other parties (particularly insurance companies) and helping establish a stable framework for the medium-term development of the agricultural insurance market. In particular, the government should commit to investing the necessary resources to ensure the strategy agreed upon has a high likelihood of success and then monitor it so that the other stakeholders act coherently with it.

2. The **choice of the strategy** for developing the agricultural insurance market in Georgia should be consistent with the resources available. Based on the RIA results and workshop discussion (on 5 November 2015) two main possibilities were identified:

a) **High budget. Starting immediately** with a full-scale program to expand the agricultural insurance market. This implies the immediate implementation of the NARMA model and a **substantial investment** (based on RIA calculations: 14 million GEL in 2016 rising to 44 million GEL in 2024) to achieve high penetration rates (6% in 2014 and 18% by 2025). **In addition** to this, government should start negotiations with insurance companies regarding an appropriate level of **risk-sharing** in the event of extremely adverse natural events (causing, for example, the loss ratio to exceed 300%). This implies that the government should be ready to step in and cover part of the losses, with potentially relevant budget implications (in addition to the amount paid for subsidies).[1]

b) **Low budget. Re-designing the current pilot program** so that the **lessons** from the future pilot are maximized. The design of the new pilot should involve the APMA and insurance companies, supported by external experts. The program should run for at least 3 years in order to collect sufficient data. It is important to stress that in this case the main goal of the exercise would not be expanding the penetration rate (incompatible with a fixed and low budget), but rather to allow insurance companies and the government to collect the data necessary for the development of the agricultural insurance market. In this case, the financial burden for the public budget would be substantially lower and could be determined in advance. To ensure the maximum impact and maximum learning, the pilot would have to be properly designed and implemented, in consultation with external experts. It is recommended that over the course of the re-designed pilot, APMA's staff, experts and insurance companies develop proper guidelines for loss adjustments (which should be tailored to Georgia) and minimum quality standards for the agricultural insurance market. Both of these actions would constitute the basis for the future development of a formal public private partnership (NARMA). It is important to note that insurance companies have mentioned being willing to contribute (even financially) to some of these activities (such as the development of proper guidelines for loss adjustment). Changes to the pilot should be carefully evaluated and designed, so that data quality is not compromised and the data can be used for future evaluation exercises and policy design. After these **goals** (learning, accumulating data, and developing more harmonized standards) are achieved, the focus of the government action could move on to **higher penetration rates** (likely with lower costs and higher effectiveness).

---

[1] At this stage, insurance companies are reluctant to change to NARMA for the following reasons: (i) insurance companies do not have sufficient data for proper calculation of risks and will not commit to take whole risks; (ii) recent bad years will make it difficult for them to involve international reinsurance in the market, and if government does not step in, they will be the only ones who bear the costs.

II. PROCEDURAL ISSUES AND CONSULTATION OF INTERESTED PARTIES

A. ORGANISATION AND TIMING

The Regulatory Impact Assessment (RIA) of crop insurance was implemented during the period between June and November 2015.

The RIA started with a preliminary meeting of the Agricultural Policy Research Center (APRC) with G4G on 24 June. The main goal of the meeting was to define:

- The objectives of the study.
- The basic differences between NARMA and NAGIS concepts.[2]
- The KfW feasibility study and general concept of NARMA.
- Possible scenarios for analysis.

After the meeting with G4G, on 26 June APRC met external insurance consultant Yan Shynkarenko to discuss general features of the insurance market in Georgia and the NARMA concept.

The first milestone, which included the description of preliminary meetings, was completed by 29 June.

The meeting was followed by a careful analysis of the KfW feasibility study (Phase 1) provided by G4G and the set of questions regarding the study prepared by APRC and sent to the external consultant. Each of the questions were addressed by the consultant, shared with G4G and discussed during the second meeting at G4G office on 3 July 2015.

The second milestone, a detailed action plan, was developed and sent to G4G by 6 July.

On 9 July, APRC had its first meeting with APMA representatives. The goal of the meeting was to discuss APMA's experience with the existing agro insurance pilot project, its expectations regarding the RIA and agro insurance-related data availability.

On 15 July, APRC attended a KfW workshop where BFC, a Swiss consultation company, presented an updated version of the feasibility study on agro insurance in Georgia. The

---

[2] NAGIS denotes the National Agricultural Insurance Scheme for Georgia. In autumn 2013, the Swiss Agency for Development and Cooperation (SDC) financed a pre-feasibility study on a national agricultural insurance scheme in Georgia. In spring 2014, SDC organized several workshops on NAGIS. All relevant stakeholders showed high levels of interest in this scheme and a general draft concept for NAGIS was developed. Since autumn 2014, KfW Entwicklungsbank has been financing two feasibility studies on agricultural insurance in Georgia. In these studies, the NAGIS concept was further elaborated and transferred into a new concept called the National Agricultural Risk Management Agency (NARMA).

workshop was attended by key stakeholders and provided the possibility to exchange opinions about the proposed agro insurance concept of NARMA.

The workshop was followed by a meeting between APRC and the Georgian Insurance Association (GIA) on 22 July. The goal of the meeting was to better understand the position of insurance companies with regard to the proposed agro insurance scheme. The meeting was attended by representatives of the insurance companies involved in the pilot agro insurance project.

This meeting was followed by a meeting between APRC and APMA on 23 July and a meeting with consultant Yan Shynkarenko on 24 July. These meetings aimed at summarizing the position of different stakeholders on the proposed NARMA concept as well as discussing some anticipated changes to the Phase II report of the KfW study.

The third milestone – a summary of the data collection process – was delivered to G4G on 27 July.

On 28 July, APRC met members of the Georgian Farmers' Association (GFA) to discuss their experience with agricultural insurance. Attendants represented family farms of different sizes. From the meeting it was concluded that the majority of association members were not insured for a variety of different reasons.

On 29 July, APRC had a meeting with G4G. The goal of the meeting was to update G4G on the status of the project and outline the arguments of APMA, insurance companies and farmers with regard to the proposed insurance scheme (NARMA).

The fourth milestone – the preliminary results of stakeholder consultations – was delivered to G4G on 7 August.

On 13 August, APRC organized a workshop on Crop Insurance Reform in Georgia. The goal of the workshop was to discuss the results of the consultation process with key stakeholders. In addition, this workshop consulted stakeholders for defining the specific objectives of the policy intervention and selecting policy options for further analysis. The workshop was attended by G4G, APMA, GIA, insurance companies, GFA, and insurance consultant Yan Shynkarenko.

A brief written summary of the workshop's results – the fifth milestone – was sent to G4G on 15 August.

On 4 September, APRC had another meeting with G4G. The goal was to update G4G on the status of the project and discuss the proposed methodological framework for a Cost-Benefit Analysis (CBA). Following this meeting, APRC prepared a document summarizing the expected results of the RIA study and shared it with APMA and G4G.

On 11 September, a set of questions regarding the final report of the KfW study and NARMA simulations was prepared by APRC and sent to Yan Shynkarenko. All of the questions were addressed by the consultant.

The sixth milestone – the mid-term report – was sent to G4G on 22 September.

The seventh milestone – the final report draft – was delivered to G4G on 7 October.

On 5 November, APRC held the final workshop presenting the results of the study. The workshop was attended by G4G, APMA, GIA, insurance companies, GFA, and insurance consultant Yan Shynkarenko.

The revised final report was submitted to G4G on 26 November.

The RIA team included ISET-PI researchers and was supported by ISET Assistant Professor Norberto Pignatti (CBA and RIA expert) and external insurance consultant Yan Shynkarenko. The team included researchers with experience in agricultural economics, agricultural insurance, CBA and RIA. Tasks were divided in accordance with the competences of researchers. The external consultant assisted the team with his expertise on the current market situation of agricultural insurance in Georgia, shared related literature about international insurance markets and existing data.

The decision making approach adopted by the team was collegial and coordinated by the team leader.

B. CONSULTATION AND EXPERTISE

Consultations with various stakeholders were held throughout the project implementation phase. Data collection took place mainly in June and July and some data was obtained in August as well.

The first step was the idenfication and categorization of the main stakeholders in an influence-interest matrix format. Table 2 presents this matrix.

Table 2. Influence-Interest Matrix

INFLUENCE / INTEREST	LOW INFLUENCE	HIGH INFLUENCE
Low Interest	National Environmental Agency	
High Interest	Farmers, GFA, Donor Community (e.g., USAID, KfW, SDC), Agro businesses	APMA (MoA), Insurance companies, Georgian Insurance Association (GIA)

Several meetings were undertaken with these stakeholders in order to develop a comprehensive overview about the current state of things and to suggest possible solutions to the problems identified.

To reach this goal, it was decided to use of a multiplicity of methods, including: desk research, requests for official data, face-to-face consultations, an online survey, and in-depth interviews with the identified stakeholders. Table 3 summarizes the information collected and methods used.

Table 3. Description of data and research methods

DATA AND INFORMATION	METHODS USED / SOURCE
International experience on agro insurance, experience of other countries and challenges they faced	Desk research, requesting data from external insurance consultant
Number of policies sold for state subsidized and non-subsidized agro insurance projects in Georgia	Requesting information from APMA and the insurance association
Amount of government subsidies for various crops and various types of farmers in the state subsidized agro insurance project in Georgia	Requesting information from APMA
Amount of premiums collected in the state subsidized and non-subsidized agro insurance projects in Georgia	Requesting information from APMA and the insurance association
Amount of insured land for the state subsidized agro insurance project in Georgia	Requesting information from APMA
Operational costs of managing the state-subsidized agro insurance project in Georgia	Requesting information from APMA
Information on loss ratios for companies involved in agro insurance in Georgia	Requesting information from APMA and the insurance association
Companies' willingness to participate in the proposed agro insurance scheme	Online survey of insurance companies
Simulation of NARMA model (insurance coverage, amount of premium, subsidy, penetration rate, budget of NARMA, etc.)	Requesting information from APMA and BFC
Information on the exposure of crops to various natural hazards in different regions of Georgia	Geoportal of natural hazards and risks in Georgia, CENN
Severity of hazards and the number of negative events for different regions of Georgia	Geoportal of natural hazards and risks in Georgia, CENN
Ad hoc payments to farmers affected by natural hazards	Requesting data from the MoF

Consultations with different stakeholders served different purposes. Meetings with G4G in the beginning of the RIA aimed to define the general purpose of the analysis. Later meetings with G4G were devoted to project updates and discussion of collected information and the opinions of different parties.

Consultations with external insurance consultant Yan Shynkarekno were useful in understanding international experience and details of the proposed NARMA agro insurance scheme.

Consultations with APMA provided insight about the position of the Government of Georgia regarding agricultural insurance as well as APMA's expectations regarding the project.

The positions of the insurance association, insurance companies and farmers were clarified during focus group discussions and in-depth interviews. The key findings of the consultations with the main stakeholders are summarized in Table 4 below.

Table 4. Summary of consultation process

STAKEHOLDER/ STAKEHOLDER GROUP	METHOD OF CONSULTATION	SUMMARY OF RESPONSES[3]	COMMENT
G4G	Interviews, meetings with G4G on: 1. 24 June 2015 2. 3 July 2015 3. 29 July 2015 (joint meeting with external consultant)	1. G4G representatives talked about the possible goals of the RIA and briefly introduced NARMA concept to APRC. 2. List of direct and indirect stakeholders and data availability for each type of stakeholder were discussed along with the difficulties of measuring the costs and benefits of various stakeholders in light of existing data. Possible scenarios for analysis were discussed during the meeting. 3. After receiving update on the positions of APMA and insurance companies with regard to proposed insurance scheme, G4G suggested to focus on APMA's priorities and get more information from insurance companies as well as their arguments on NARMA's advantages and disadvantages.	Response taken into consideration
External insurance consultant Yan Shynkarenko	In-depth interviews on: 1. 26 June 2015 2. 3 July 2015 3. 23 July 2015	1. Consultant discussed costs of NARMA, its functions, the absence of weather data, importance of training and awareness raising campaigns, compulsory and semi-compulsory agro insurance, and the low (5%) penetration rate to be expected in the beginning. He emphasized the lack of reliable data about agro insurance in Georgia as well as the lack of public detailed weather data. 2. Details of joint meeting with the consultant and G4G held on 3 July were discussed. 3. Consultant provided more details about the costs of NARMA and discussed different possibilities of covering those costs; he talked about the advantages of NARMA as a PPP responsible for all agro insurance related issues. Since government is subsidizing the project, he emphasized the importance of making sure that it	Response taken into consideration

---

[3] Remember that the RIA does not have to contain an outline of all comments received nor all answers to each issue or concern raised.

		should have some leverage and insurance companies should accept the conditions of NARMA.	
All stakeholders	Workshop on 15 July 2015	The first section of the workshop was devoted to discussion of the feasibility of agro insurance in Georgia, different models of agro insurance and viable options for Georgia. According to the presenter, insurance products should be different for commercial and subsistence farmers. Financial institutions are well-positioned as a delivery channel for agro insurance because of existing high penetration level at the market; Institutional set-up of agro insurance and country context were considered in the first part of the workshop. The second part of the workshop provided more detailed cost estimates for establishing NARMA. Insurance product specifications were also provided. Several versions of the product were presented with different levels of premium subsidies and insurance limits for various crops and types of farmers. Insurance companies expressed their concerns regarding paying a share of gross premiums to NARMA to finance its administrative costs.	
APMA	In-depth interviews on: 1. 9 July 2015 2. 23 July 2015	1. Agro insurance law should be changed; analysis should help government make decisions; the BFC consulting company worked on the NAGIS concept and incorporated its parts into the NARMA concept; APMA expects clear financial structure of NARMA to be presented during the workshop; subsidies will be provided but government's role is expected to decrease over time; social aspects of APMA projects are very important; pilot project worked well, but there were some issues with policy sales (fraud); promotional campaigns are needed to increase penetration rates. 2. According to APMA representatives, APMA is not well positioned to be responsible for agricultural insurance because it does not consider insurance as a project. Development of the insurance market is a task which requires separate treatment. It requires extensive capacity to evaluate losses and process claims. With existing resources, during the pilot project it was very	

		difficult for APMA to handle the claims of those farmers who were not satisfied with the insurance company's service. NARMA, as a PPP, is acceptable for APMA and is considered an optimal solution and tool for the development of the insurance market.	
Farmers, Agro businesses	In-depth interview on 28 July 2015	Farmers talked about the problems with infrastructure and the need for government involvement. The majority of them are not insured, but would consider insuring their farms in the future if insurance conditions are acceptable. Farmers pointed to a lack of qualified insurance sales agents and their inability to answer basic questions about the insurance products they offer. The lack of offices (branches) and information sources about agro insurance were also emphasized. According to farmers, at the initial stage of the insurance market development, it will be more effective if farmers are directly approached by sales agents. There is a need for the development of loss adjustment guidelines and delivery of information to farmers in simple language.	Response taken into consideration
Georgian Insurance Association; Insurance companies	Focus group discussion on 22 July 2015	According to the insurance association and insurance companies, agro insurance is not possible without high government subsidies; government does not have clear targets regarding the desirable penetration rate; a clear long-term or at least mid-term government strategy regarding the agro insurance budget and subsidy level should be developed; APMA is a good partner for the insurance association and insurance companies and they suggested to continue as it is now, without creating NARMA. Insurance companies are not convinced that NARMA is needed. According to the companies, there is no need for pooling risks if the portfolio is relatively small.	Response taken into consideration
All stakeholders	Workshop on 13 August 2015	APRC made a presentation outlining the main factors affecting the demand and supply of agricultural insurance and stating the main reasons for government intervention in this market. The presentation showed a summary of the results of stakeholder consultations conducted by the APRC team in June-July 2015. The participants verified the results of previous consultations. All stakeholders agreed that the governmental objectives of the policy reform are too broad and there is a need to narrow these objectives for further analysis. The participants also discussed the specific	Workshop results were taken into consideration

		policy objectives suggested in the presentation and gave several useful comments regarding the indicators suggested by APRC.	
		As the result of this workshop, the following policy options were selected for further analysis:	
		• Policy Option 1: The possibility that government does not introduce NARMA but continues with the current pilot.	
		• Policy Option 2: The possibility that government adopts NARMA model.	

III. PROBLEM DEFINITION

A. POLICY CONTEXT

The Government of Georgia (GoG) intends to create a national agricultural insurance program. The program will have the mandate of providing subsidized agricultural insurance to all Georgian farmers on a voluntary basis.[4]

In 2014, the GoG piloted its crop insurance program and determined that it should form the basis for a wider rollout of crop insurance to Georgian farmers. On average, 94% of insurance premiums were subsidized by the government. In 2015, another pilot crop insurance program was launched with a considerably lower level of premium subsidies (55%, on average).

The goals of these programs (GoG, 2014; GoG, 2015) are to (i) develop the agricultural insurance market in Georgia; (ii) support agricultural production and increase the competitiveness of farmers and agro businesses; and (iii) support the income of people involved in agricultural activities and minimize their risks.

Both pilot programs insure against the following weather risks: hail, excessive precipitation, heavy winds, and autumn frost.[5] Over 24,000 insurance policies were sold over the course of these pilots. Both pilot programs were implemented by the Agricultural Project Management Agency (APMA) of the Ministry of Agriculture of Georgia.

Along with these pilot projects, GoG initiated development of a sustainable long-term crop insurance policy and regulatory framework. The KfW Development Bank financed a feasibility study to support the development of an insurance model in Georgia. The model under consideration is called the National Agricultural Risk Management Agency (NARMA). NARMA will be designed as a public-private partnership, and the organization and management of the national agricultural insurance scheme will be distributed among the public and private sectors.

In the near future, it is expected that the government will decide on a concrete model that will be used to manage the agricultural insurance process in Georgia. The purpose is to conduct a Regulatory Impact Assessment (RIA) of insurance models and recommend selection of the best policy option.

B. PROBLEM DEFINITION

Agricultural production is associated with a variety of risks, such as market, institutional and production risks. An important production factor in agriculture is weather. Its uncontrollable nature makes weather risk the prevailing risk to agricultural production. Farmers have various

---

[4] There are the following options under discussion: (i) voluntary for all farmers in all groups – from smallholders to large-scale commercial farmers, and (ii) semi-compulsory for all beneficiaries of any state-subsidised program for agriculture.
[5] Applies only to citrus plants; coveres the period from 1 September to 10 December.

informal and formal means to transfer and mitigate risks. Informal means include savings, diversification, off-farm activities, etc. The most common formal means of risk mitigation is insurance, which transfers risk to a third party in return for a premium. The agricultural insurance market faces several challenges on both the demand and supply sides, making government intervention necessary. The economic, technical, and organizational constraints that justify governmental intervention in this market are outlined below.

The following factors, among others, might influence demand for agricultural insurance (Mahul and Stutly, 2010; Coble and Barnett, 2012):

(a) Degree of risk aversion: the higher the degree of farmers' risk aversion, the higher the demand for insurance;

(b) Expected income transfer (premium subsidy): the higher the level of premium subsidies, the higher the demand for insurance;

(c) Asymmetric information: this denotes a situation in which there is an imbalance of information between market participants. Asymmetric information causes two main problems that are common in agricultural insurance markets: *adverse selection* and *moral hazard*.

Adverse selection occurs due to an insurer's inability to perfectly assess farmer's risk exposure. The effect of adverse selection on insurance demand is undetermined. If a farmer's perception of risk is lower than the insurer's risk estimate (reflected in the premium rate), the demand will be lower, and vice versa. It is often assumed that farmers have better information about the risks they face. In this case, adverse selection might lead to a situation in which farmers in disaster-prone regions frequently purchase insurance, causing premium rates to raise, which, in turn, decreases participation.

Moral hazard denotes a situation in which farmers have incentives to be involved in risky activities, knowing that insurers will compensate them for their losses. From this standpoint, moral hazard would increase farmer's participation in the insurance market.

(d) Other means to control risks: since insurance should be designed to deal with asymmetric information, it might be a more expensive risk management instrument compared to other risk-minimizing means, such as hail nets, savings or diversification. However, these other means are often not sufficient to deal with weather related risks and insurance products are thus complements to rather than substitutes for other risk-minimizing tools available to farmers.

In addition to these factors, the demand of agricultural insurance might depend on farmers' awareness and experience, individual loss ratios, indemnities, etc. In general, the literature finds that the demand for crop insurance is price inelastic, suggesting the necessity of large premium subsidies to increase farmers' participation (Coble and Barnett, 2012).

On the supply side of agricultural insurance, the following aspects are relevant (Mahul and Stutly, 2010; Coble and Barnett, 2012):

(a) Type of weather risk. Crop insurance products can be classified, according to the risks they cover, into named-peril and multi-peril agricultural insurance schemes. Named-peril insurance covers losses that occur due to specific perils, such as hail, fire, and wind. Such weather risks are measurable, and it is easy to estimate expected losses. Therefore, insurance against these types of risks are often underwritten by private insurance companies. Multi-peril insurance products provide insurance for several perils simultaneously. Some weather events covered by multi-peril insurance, such as droughts or floods, are associated with the existence of systemic risks. Systemic risk denotes a situation in which risks are not independent but are highly correlated across a geographical area. This systemic component may generate large losses for insurance companies. Moreover, due to the high volatility of natural disasters, the loss ratio of insurance companies varies widely. Therefore, the high risk associated with such weather events reduces the interest of private insurance companies to enter such markets without public support.

(b) Data availability. One important aspect of premium rates is expected loss cost. To precisely calculate expected loss cost, it is necessary to have accurate historical data on catastrophic events. However, such data are rarely available worldwide, forcing private insurers to add a so-called ambiguity load to the expected loss cost in their premium calculations.

(c) Administrative costs. The administrative costs involved in agricultural insurance are particularly high compared with other sectors. This is related to necessary activities, such as establishing expected yields, verifying realized yields, monitoring input use and production practice, etc.

The fundamental problem of agricultural insurance (particularly when insuring catastrophic perils) can be stated as follows. Farmers are characterized by cognitive errors involved in analyzing extremely low probability events, and they often underestimate their risk exposure. They also have limited information and cognitive problems that make it harder to understand the nature and the details of the contract. Insurers add a so-called ambiguity load (due to data limitation) and administrative cost load (which is particularly high in the case of agriculture), ending up with high risk premium estimates. This causes insurance markets to operate at a less than socially-optimal level of risk transfer (Coble and Barnett, 2012).

In addition, as a developing country, Georgia faces additional constraints in developing its agricultural insurance market. A regulatory framework for an agricultural insurance program has not yet been developed. Institutional and technical capacity for administering agricultural insurance (e.g., loss adjustments and distribution of policies) is underdeveloped in the country. Dealing with adverse selection would require tailoring insurance products to specific groups of farms that have similar risk levels. However, the availability of farm and weather data is very limited in Georgia, constraining the development of insurance products. In addition, Georgian farmers lack awareness of and experience with agricultural insurance, making them reluctant to insure their production. Farmers do not fully understand how insurance companies will behave in the event of a negative event. This uncertainty and distrust reduces farmers' willingness to subscribe. Overcoming these constraints will require, at least at the very

beginning, a stronger role played by the government as both a regulator and "sponsor" of the program, in order to make sure that sufficient experience/knowledge is accumulated.

In summary, the main reasons the Georgian government should intervene in the agricultural insurance market are the existence of systemic risks (severe natural disasters impacting a large number of farmers simultaneously); asymmetric information (e.g., moral hazard and adverse selection); the lack of technical infrastructure (data basis and a data collection network, both of which are necessary to estimate risks and premiums more precisely); the lack of an insurance culture and education; and the lack of institutions and a regulatory framework.

One of the most common measures for intervening in the development of agricultural insurance markets are premium subsidies. The subsidized part of a premium varies across countries, being highest in the initial stage of the development of insurance markets. Other support measures include contributing to administrative costs, investing in product development (e.g., improving data availability to enable the development of affordable insurance products), developing a legal framework, assisting in developing technical capacity (e.g., for loss adjustments and product delivery), and assisting in raising awareness about agricultural insurance.

The absence of a well-functioning agricultural insurance market in Georgia negatively affects several actors:

- **Farmers:** since more than half of the Georgian population is involved in agriculture[6] (small farming, in particular), agricultural insurance is crucial for the country. Most Georgian farmers know little about the functions and benefits of agricultural insurance. Moreover, without premium subsidies, agricultural insurance is not attractive to many farmers, who use other risk minimization strategies. Different regions of Georgia are prone to various natural disasters (hail, stong winds, floods, frost, and droughts). The availability of effective and affordable insurance will significantly reduce the vulnerability of Georgian farmers, contributing to the stability of their incomes. Furthermore, agricultural insurance products might be used as a guaranteed source of cash flow, increasing farmers' access to finance. Premium subsidies could be seen as a way to give farmers the possibility to experience the benefits of agricultural insurance first hand, reducing the information gap and allowing them to better appreciate its potential benefits. Once this objective is achieved, subsidies could be reduced.

- **Insurance companies:** before the pilot insurance programs, only a small number of Georgian insurance companies included agricultural insurance in their product portfolio. It was generally named-peril products, such as hail insurance, that were offered. The low interest of insurance firms in this sector was related to high administrative costs and the unattractiveness of insuring against weather events related to systemic risks. In addition, insurance companies lack the capacity to properly price risk. Six Georgian insurance companies participated in the pilot programs (2014 and 2015), and over 24,000 insurance policies have been sold so far. The land insured

---

[6] This number might be different after the results of the new census (from 2014) become available.

as a result of the two pilots amounts to about 4% of total agricultural land in Georgia. A national agricultural insurance scheme might support insurance companies to further expand their business operations, by pooling a number of functions and improving their technical capacity in terms of loss adjustment procedures and delivery of policies.

- **The Government of Georgia:** the development of an agricultural insurance market in Georgia is valuable from economic, social, and developmental standpoints. A functioning agricultural insurance market might contribute to the increase in productivity and competitiveness of the country's agricultural sector. The causal link might be as follows: farmers might be able to make savings because the insurance indemnifies them for crop losses. They could then invest these savings into better technology, improving their productivity. In addition, their access to finance might be improved. All this improves their competitiveness. Agricultural insurance will provide financial protection against weather risk and stabilize household income. A national agricultural insurance program might partly replace the ad hoc disaster payments needed to assist farmers who suffer crop losses due to natural disasters. This will positively affect the state budget. Furthermore, the success of current government undertakings in the development of the agricultural sector (e.g., providing cheap loans to farmers) is closely linked to a well-functioning insurance system in the country. Nevertheless, the level and duration of government intervention also matters in the long run. Government involvement might negatively affect competition and delay insurance product development. Therefore, once the Georgian government helps private companies establish the system and build a sustainable model of agricultural insurance, it should gradually reduce its involvement in the process. After insurance companies and farmers become more experienced, data are collected and the market reaches a substantial size, the need for direct government support will decrease. Nevertheless, government's involvement as a regulator and monitor, as well as a need for some financial support, will always remain.

C. BASELINE SCENARIO

The baseline scenario is defined as a policy option in which nothing changes in terms of the existing legislation. In this, the current trends in population growth, economic performance, and insurance sector growth are each assumed to continue unchanged. The baseline scenario will introduce all the existing data and the expected evolution of the market.

Of particular interest for the baseline scenario is to look at the past experience of the insurance market, observe the current trends, and analyze what is expected to happen in the future. The data descriptions given in this section will be analyzed in subsequent sections.

Before Pilot

According to the Georgian Insurance Association (GIA), agricultural insurance in Georgia has been present since 2004. Initially, the system was totally private and government did not participate in the market. Only two insurance companies were involved in agricultural insurance and insured risks included: hail, storms, excessive rainfall and fire. Table 5 shows the information for the pre-pilot years.

Table 5. Agricultural insurance in Georgia, 2004-2010[7]

Year	Premium income GEL	Paid losses GEL	Technical result GEL
2004	143,225	38,487	104,737
2005	214,069	108,961	105,108
2006	151,354	80,983	70,370
2007	144,237	61,542	82,694
2008	102,995	68,464	34,532
2009	39,373	36,045	3,328
2010	76,933	84,805	-7,872

Source: Georgian Insurance Association.

Judging from the low level of premium income, only a relatively small number of farmers were insured in those years.[8] Moreover, after reaching a maximum in 2005, the total premium income decreased substantially as time passed. Among the possible reasons for such a low penetration rate are a lack of trust and awareness about agro insurance on the farmers' side, together with the high cost of insurance packages and the lack of interest and willingness for insurance companies to invest in this sector.

An analysis of the technical results of companies seems compatible with the situation in which insurance contracts were concentrated in some specific areas. This is confirmed by additional information provided by the GIA. Grapes were planted on around 85-90% of the insured land and the remaining insured crops were wheat, corn, sunflower seeds and fruit. Insurance was mostly as result of the initiative of few large farmers.

A situation like this leads to large fluctuations in both the paid losses and the technical results of insurance companies, with respect to the premium income collected. Companies have to pay a lot when a negative event occurs, but they gain a lot when it does not. If companies raise the premium in order to limit their risks, farmers in low-risk areas soon realize that they are paying too much and thus withdraw from the scheme. This leads to a reduction of the surface insured. At the same time, the quality of the portfolio deteriorates, together with the economic results of the company. Further attempts to increase the premium exacerbate rather
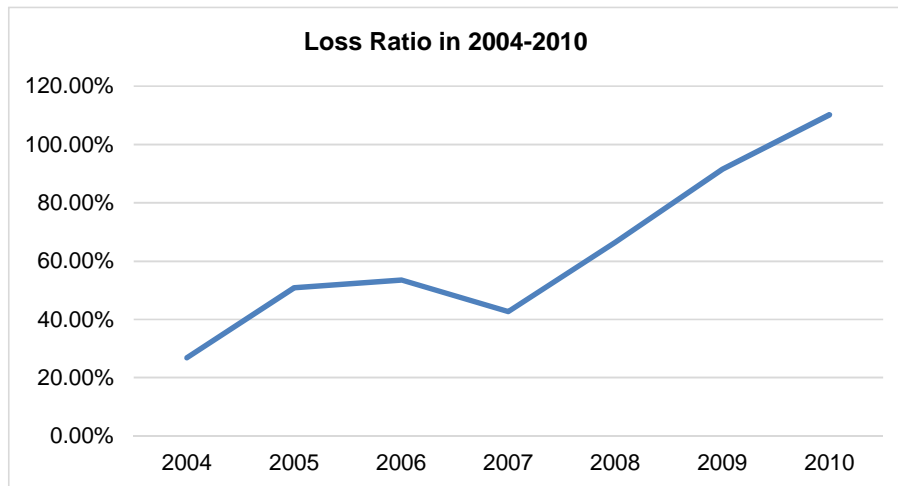
---

[7] The sum of the results from two insurance companies that provided agricultural insurance.
[8] The premium income indicated in Table 1 is very small compared with that of the current pilot insurance programs. For example, the total premium income in 2014 was 12,503,782 GEL.

than solve the problem. This is a real danger, especially if premiums are constant across customers and not based on actual risk exposure.

The same trend discussed above is reproduced in Figure 1 below, expressed in terms of the loss ratio of insurance companies. Loss ratio is expressed as a percentage and is the ratio of incurred losses to earned premiums.

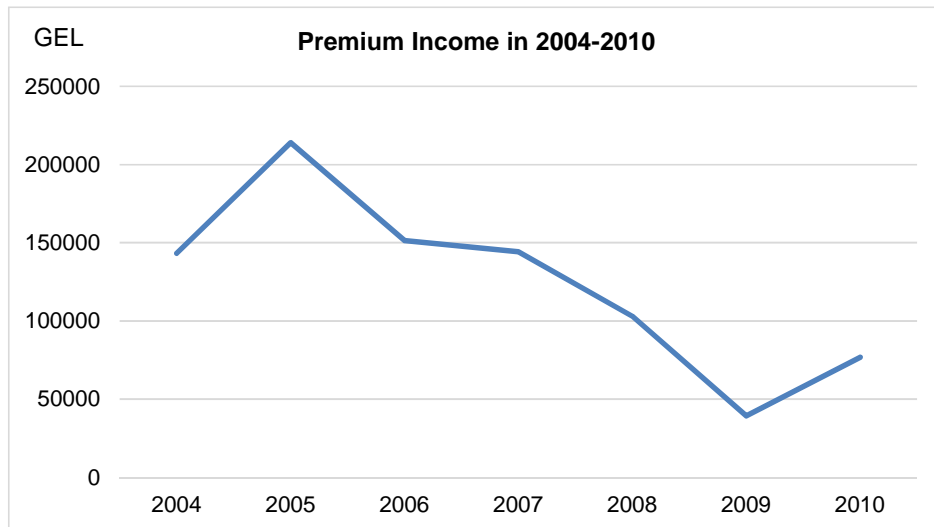**Figure 1. Loss Ratio of Insurance Companies, 2004-2010**

Source: Georgian Insurance Association (GIA).

Consistent with what was discussed above, the loss ratio increased over time, from an extremely low level in 2004 (about 30%) to more than 100% in 2010. Moreover, we see from Figure 2 that, starting from 2005, the total premium paid over the same period has a decreasing trend.

Figure 2. Total Premium Paid in 2004-2010

Source: Georgian Insurance Association (GIA).

Pilot program in 2014

In 2014, the Government of Georgia decided to intervene in the sector and started a pilot program. This project was initiated by the Ministry of Agriculture and was launched on 1 September 2014. Four insurance companies participated in the pilot: GPI Holding, ALDAGI, IC Group and IRAO.[9]
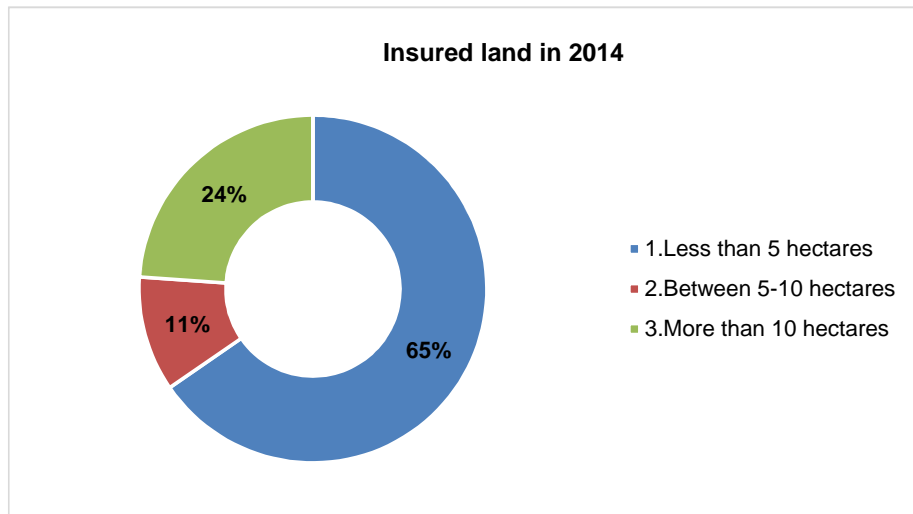
In its first wave, the pilot led to the insurance of 34 different crops, with the overall value of insured crops exceeding 150 million GEL. The proposed insurance package covered hail, excessive rainfall, hurricanes and autumn frost. The first wave of the pilot program was more successful than expected – also because the average subsidy level was 93.7%[10]. The lowest level of subsidy was 74% for tangerines and the highest level was 95% for vegetables and berry crops.

The amount of subsidy made available in 2014 was 11.6 million GEL and it was exhausted after few months. A total of 89% of policies were sold in the first three months (September-November 2014). Insurance companies sold a total of 20,952 polices in the first pilot (Pilot Program 2014).The average insured land size was 0.63 hectares and the largest land plot insured was 130 hectares of wheat. No restriction was imposed on the maximum size of plots of land to be insured.

---

[9] QARTU Group was also initially involved, but after some time withdrew from the pilot program.
[10] The subsidy level for hazelnuts was 92% and varied between 88% and 94% for grapes.

Figure 3. Insured land according to size in 2014

Source: Agricultural Projects' Management Agency, authors' own calculations.

In Figure 3, we can see the share of smallholders[11] versus large farms. Of the total insured land in 2014, smallholders owned 65% (12,164 hectares). The sum of insured land between 5 and 10 hectares accounted for 11% of the total (1,990 hectares); the remaining 24% (4,442 hectares) belonged to farmers with land of more than 10 hectares.

Pilot program in 2015

The pilot insurance project continued in 2015 under different conditions. The second wave of the pilot started on 19 February 2015. The budget allocated to the project was 8.5 million GEL and two additional insurance companies, "Ardi" and "Unison", joined the program. The subsidy level was reduced to 55% on average, which was much lower than in 2014.[12] Subsidies for grapes accounted for 40% and was 60% for all other crops. This time, restrictions were introduced on the maximum size of land plots that could be insured. In general, farmers with more than 5 hectares of land were excluded from the project.[13] According to APMA, this restriction was imposed because they wanted the program to be focused on low-income beneficiaries.

In this pilot, the allocated budget was not exhausted. Only 3,439 policies were sold by 7 July 2015. Out of 8.5 million GEL only 13% (1.1 million GEL) was spent from the budget as premium subsidies, but the program is not finished yet. Insurance companies state that the lower subsidy level negatively affected the market. With better conditions (higher subsidy levels), companies would have sold many more policies, because farmers had started to

---

[11] Smallholders were considered to be farmers who own less than 5 hectares of land.
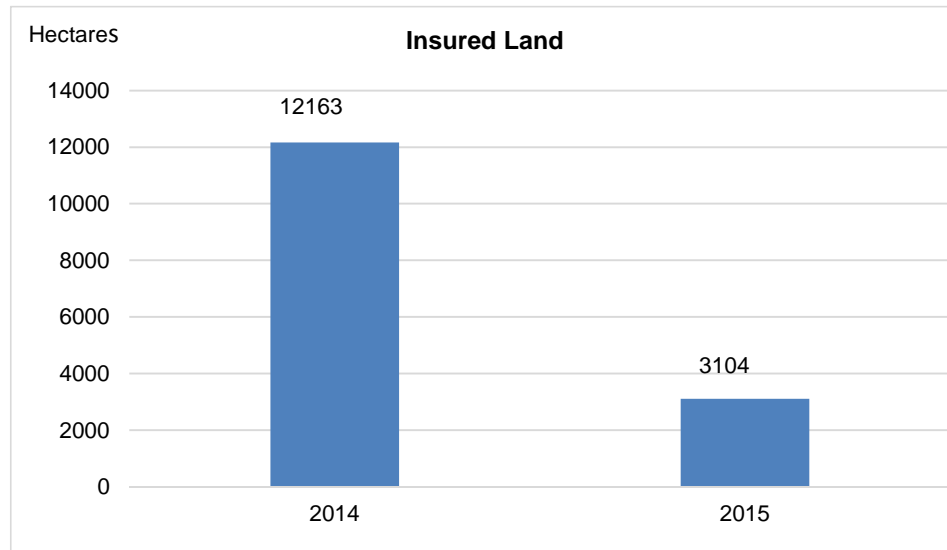[12] In 2015, the subsidy level for hazelnuts was 60% (92% in 2014) and for grapes it was down from 88%-94% to 40%.
[13] There were a few notable exceptions to this general rule. Farmers growing wheat could insure up to 15 hectares of land and the limit on land size did not apply to registered cooperatives.

realize the real benefits of insurance but were not yet willing/able to pay the price of insurance offered in 2015.[14]

Figure 4 shows the total amount of insured land in 2014 and 2015.[15]

Figure 4. Insured land in 2014 and 2015 (small farmers with land of less than 5ha)

Source: Agricultural Projects' Management Agency, authors' own elaboration.

In order to avoid overestimating the change in participation in the program because of the different eligibility conditions, we subtracted large farmers (having more than 5 hectares of land) from the total sum of insured land in 2014. Yet a significant drop can still be seen in 2015 (Figure 4). The difference between the two years can be explained by the lower subsidy level and the other factors discussed above.

Georgia has 529,102 hectares of arable land and land for perennial crops (GeoStat). The penetration rate of agricultural insurance was 3.5% in 2014, and amounted to 0.6% in 2015 (as of July). The insured areas differed across regions. In Kakheti, the areas insured totalled 9,645 hectares in 2014 and 1,441 hectares in 2015. Only 8 hectares were insured in Imereti in 2014 and this increased to 29 hectares in 2015. Insured land decreased in Kvemo Kartli from 1,862 hectares in 2014 to 103 hectares in 2015. The only region that did not participate in the pilot in 2014 was Samtkhe-Javakheti. It joined the program in 2015 with 245 hectares of land insured.

---

[14] It is important to mention that, on average, the co-payment requested from farmers increased significantly, from about 6% of the premium to about 45% of the premium (almost 8 times larger).

[15] It should be noted that in 2014 there were instances of abuse of the program from the side of insurance agents, as the subsidy level was 93.7% and the insurance selling agent's commission accounted for 10-20% of the collected premium. Therefore, in some cases insurance agents themselves paid the premium for farmers. In 2015, the subsidy level was much lower, and this factor was thus eliminated. Some of the decrease in the penetration rate might thus be due to this factor.

IV.OBJECTIVES

A. GENERAL OBJECTIVES

The general objectives of government intervention (Government of Georgia, 2014; Government of Georgia, 2015) are to:

1. Develop the agricultural insurance market in Georgia

2. Support agricultural production and increase the competitiveness of farmers and agro businesses

3. Support the income of people involved in agricultural activities and minimize their risks.

B. SPECIFIC AND OPERATIONAL OBJECTIVES

A number of specific and operational objectives are associated with the general objectives listed above:

1. Development of the agricultural insurance market in Georgia:

   a) Increasing demand for agricultural insurance;

   b) Develop affordable insurance products for farmers and agro businesses;

   c) Improve the technical capacity for loss adjustment, product development and delivery;

   d) Expand the agricultural insurance business;

   e) Reduce the degree of information asymmetry in the market and improve data availability;

2. Support agricultural production and increase the competitiveness of farmers and agro businesses:

   a) Increase the value of agricultural production;

   b) Increase investments in agricultural technology;

   c) Increase access to finance;

3. Support the income of people involved in agricultural activities and minimize their risks:

   a) Reduce farmers' vulnerability to natural disasters;

   b) Smooth income fluctuation in agricultural areas.

Table 6. Summary of objectives

GENERAL OBJECTIVE	SPECIFIC OBJECTIVE	INDICATOR	RESPONSIBILITY
1.Development of the Agricultural Insurance Market in Georgia	a. Increasing demand for agricultural insurance	1. Amount of insured land (ha); 2. Share of farmers insured (%); 3. Number of insurance policies sold.	Public authority and insurance association
	b. Developing affordable insurance products for farmers and agro businesses	1. Subsidy level (%); 2. Premium rate (%).	Public authority and insurance association
	c. Improve the technical capacity for loss adjustment, product development and delivery	1. Number of certified loss adjusters; 2. Number of insurance products developed; 3. Number of guidelines developed; 4. Number of insurance agents trained on agricultural insurance products.	Public authority and insurance association
	d. Expansion of the agricultural insurance business	1. Change in the share of companies' profits coming from agricultural insurance (%); 2. Average share of agro insurance in total portfolio (%).	Insurance companies
	e. Reducing the degree of information asymmetry in the market and increasing data availability	1. Collection of data about all crops and all regions in a centralized dataset; 2. Free access to data for insurance companies, product developers and customers.	Public authority and insurance association
2.Support Agricultural Production and Increase the Competitiveness of Farmers and Agro Businesses	a. Increased value of agricultural production	1. Increase in agricultural output on insured land (%); 2. Increase in the average value of agricultural output on insured land (%).	Public authority, farmers and agro businesses
	b. Increased investments in agricultural production	1. Investments in fertilizers/pesticides or other inputs.	Farmers and agro businesses
	c. Increased access to finance	1.Amount of land as collateral (ha); 2.Insured yield as support for collateral.	Banks and MFIs

3.Support the Income of People Involved in Agriculture and Minimize Their Risks	a. Reducing farmers' financial vulnerability	1. Loss ratios (%); 2. Value of losses reimbursed (GEL); 3. Timely loss indemnification.	Public authority and insurance association
	b. Smoothing income fluctuation in agricultural areas	1. Measure of volatility of income of farmers.	Public authority and insurance association

V. POLICY OPTIONS

This section presents policy options selected after consulting with stakeholders, identifying the nature of the problem to be solved and defining the objectives that the policy options should help achieve.

Before introducing the policies that were ultimately selected, it is important to mention two options that were discarded at an early stage:

1. The possibility that government does not involve insurance companies in the development of the insurance market, instead managing agricultural insurance itself by creating a state-owned insurance company. This option was discarded during consultations with stakeholders because it would require substantially more human and financial resources than the alternative options in order to be implemented successfully, and it has a higher potential for corruption and low efficiency. Although there might be successful examples of state managed insurance models abroad, there was a broad consensus among the stakeholders that this kind of model is not feasible in Georgia at the current stage of insurance market development.

2. The possibility that private insurance companies develop and manage agricultural insurance without government support (in particular through subsidies). The decision to drop this option is based on the feedback we received during our meetings with stakeholders and on two pieces of evidence suggesting that the development of the agricultural insurance market without government subsidies would not be feasible at the current stage of development. The first one is the recent experience of two Georgian insurance companies that tried, following requests coming from a few large farmers, to implement agricultural insurance without government subsidies in the period 2004-2010. Penetration rates in terms of insured land were very low and, after a small increase in the first years, were constantly declining. The second piece of evidence is provided by the pilot project that took place in 2014-2015. Despite the many confounding factors, there is general agreement among the stakeholders involved that one of the main reasons for the significant drop in penetration rates observed in 2015 was the reduction of government subsidies (on average they decreased from about 94% to 55% of the premium).

The two options described above were discarded in favor of two more feasible options:

1. Policy Option 1: Government does not introduce NARMA but continues with the current pilot (Baseline Scenario).

2. Policy Option 2: Government adopts and develops the NARMA model and starts to implement it in 2016 (Alternative Scenario).

For simplicity and greater comparability, in the quantitative analysis of both options it is assumed that the introduction of agricultural insurance does not affect agricultural GDP and does not change individual behavior. This assumption is removed in the qualitative analysis.

Other important and common assumptions are the following:

- The demand for agricultural insurance is affected not only by the price (in our case, by the fraction of the premium paid by the farmers) but also by the feedback from satisfied

and dissatisfied customers. Because the share of the premium paid by the government does not change in Option 1, feedback effects are the stronger drivers of an increase in penetration rates over a 10-year horizon. Feedback can go in different directions. For example, negative experiences due to the lack of proper training of sales agents and loss adjusters can slow market penetration, while positive experiences with loss adjustment and indemnification can lead to accelerated market penetration.

- Related to the previous point, we also assume that lower coverage[16] – implying less frequent indemnification – generates more skepticism (and lower demand) in the short term, until the functioning of agricultural insurance is fully understood.

- Finally, we assume that frequent changes in government policies and in the characteristics of insurance products have a negative impact on demand (again, through an increase in skepticism among farmers).

A. POLICY OPTION 1

In this option, the government continues to finance the currently running pilot insurance project for another 10 years. Under this scenario, the current legislation will not be changed and nothing will be done to alter the current trends, except continuing to provide subsidies and financing APMA operations. This implies that the development of the agricultural insurance market will follow current trends.

The main assumptions of the baseline scenario are:

- The percentage of the premium covered by the government subsidies does not change during the entire time period (10 years), fixed at the level announced by the government in August 2015;

The APMA staff is increased sufficiently to ensure that the quality of service they provide remains unaltered.

Evolution of the penetration rate (farmers and hectares)

Of particular interest will be the evolution of the penetration rate. The penetration rate will be affected by a number of factors. The starting point is potential demand in 2016. We have estimated the potential demand for small and large farmers using all available information from the 2014-15 pilot to calibrate a simple model. In our baseline estimates we have assumed that small farmers are twice as responsive as large farmers, that is, the same change in the premium paid has twice the effect (positive or negative) on the demand coming from owners of smaller farms than on that coming from the owners of large farms. However, changing this assumption, increasing or decreasing the relative responsiveness of small farmers to changes in the subsidy level, does not appear to have a significant impact on the final results in terms of hectares and farmers insured. We have also assumed that in the baseline scenario the evolution of the demand for agricultural insurance will be determined by the diffusion of

---

[16] The amount of risk or liability covered for a farmer by way of insurance services. Insurance coverage is issued by an insurer in the event of unforeseen or unwanted occurrences. Higher coverage leads to higher premiums and visa versa.

information through individual networks, without any particular investment in awareness campaigns.

The stakeholders whose costs and benefits will be analyzed in this option are farmers, insurance companies and the government (the costs associated with the section of APMA that is managing the program in this scenario are considered as government costs).

More specific assumptions for this scenario are presented in the section describing the methodological approach.

The main advantages of this scenario with regard to the government's objectives – as identified during our stakeholder consultations and our analysis of the existing economic literature – are:

- The implementation of the program relies on a well-established body (APMA) that has a good working relationship with the main private stakeholders (insurance companies and farmers) as well as a strong bargaining position vis-à-vis the Ministry of Agriculture;

- An additional benefit is that APMA can jointly manage the agro insurance project with other agricultural projects implemented by the agency;

- Relatively low operational costs compared to the second option.

The disadvantages include:

- A relatively lower quality of services (sales agents and loss adjusters) due to the current scarcity of investments in that area, potentially hampering the development of the insurance market;

- Less investment in the development of the required infrastructure with public good characteristics (mainly centralized data collection and provision);

  The APMA section dedicated to the development of the insurance market is currently understaffed (with respect to expected future needs).

Potential risks associated with this option are:

- Since the quality of service is not expected to improve, the diffusion of insurance culture and trust in the insurance tool risks being sluggish, slowing down the speed of penetration and requiring the government to keep paying relatively higher subsidies for longer periods;

- Delays in the realization of new and cheaper products, based on the effective characteristics of the Georgian market;

- Difficulties in assuring the orderly and effective development of the agricultural insurance market as its size grows.

B. POLICY OPTION 2

In this option, government and insurance companies jointly establish NARMA, which is a private-public partnership for managing agricultural insurance in Georgia. NARMA becomes responsible for the development of insurance products, the training and certification of loss adjusters, initiating of insurance law, spreading insurance culture among farmers, etc. In this scenario, APMA no longer manages agricultural insurance.

The main assumptions of the second scenario are:

- The percentage of the premium covered by government subsidies will change three times during the first five years (as in the BFC report) and remains constant from the fifth year onwards;

- The skills and ability of loss-adjusters and insurance agents will improve, thanks to the training provided by NARMA and to the higher standards introduced in the sector by law and enforced by NARMA. Their numbers will also increase in order to satisfy increasing demand. This will translate into a decreasing share of dissatisfied customers (better feedback and a faster increase in demand) as time passes;

- NARMA's staff will be sufficient to establish and maintain a high quality of service;

- NARMA will actively promote the insurance culture, increasing farmers' awareness through various media;

Evolution of the penetration rate (farmers and hectares)

Starting from the potential demand in 2016 and maintaining the same assumption about the relative responsiveness to changes in insurance premiums of small farmers with respect to large farmers, we have allowed additional factors to affect the final penetration rate. Among these are:

- the improvement in the experience of the insured farmers, providing more positive feedback (positive indirect impact);

- investments in awareness campaigns (positive direct impact);

- the decrease in government subsidies during the first five years (negative impact, both direct and indirect).

The stakeholders whose costs and benefits will be analyzed in this option are the same as in the baseline scenario (farmers, insurance companies and the government) plus NARMA, considered separately from the government (different from APMA).

More specific assumptions for this scenario are presented in the section describing the methodological approach.

The main advantages of this scenario with regard to the government's objectives – as identified during our stakeholder consultations and our analysis of the existing economic literature – are:

- The implementation of the program relies on a public-private partnership designed to insure cooperation between the main stakeholders. The partnership has a clear mission (supporting the development of the agricultural insurance market in Georgia) and the necessary resources to pursue it;

- NARMA can pool several activities currently performed by the insurance companies separately, potentially exploiting economies of scale and reducing average administrative and operative costs of the insurance companies, including loss adjustment and reinsurance costs;

- With its dedicated and qualified personnel, NARMA will be best positioned to provide training and technical support to insurance companies, ensuring higher operational standards and helping to create standardized, higher quality insurance products tailored to the Georgian market;

NARMA will also take the lead in generating and maintaining the technical infrastructure necessary for the correct functioning and development of the market (e.g. collection, storage and diffusion of data about losses).

The disadvantages include:

- Relatively higher administrative and operative costs;

- Relatively higher "distance" from the government;

- Insurance is implemented by NARMA which, as a newly established body, has to esquire a reputation among stakeholders and needs to be developed from scratch.

Potential risks associated with this option are:

- Being more detached from government. The political weight of NARMA risks being diminished compared to what it would be the case if the program were still managed by APMA. Even worse, NARMA could end up competing with APMA for funds, which would weaken NARMA's position and potentially endanger the long-run sustainability of the insurance program;[17]

- In case NARMA is perceived by the insurance companies as an imposition and an additional, costly, burden on them, rather than as a profitable partnership, this might backfire and reduce the support insurance companies give to the program. This could potentially have very negative consequences;

- NARMA's success depends on the strict monitoring and unwavering support from both public and private partners. Without this, the higher administrative and operational costs associated with such a new structure would not be justified.

---

[17] This concern has been expressed by a few stakeholders that were interviewed.

VI. ANALYSIS OF IMPACTS

A. METHODOLOGICAL APPROACH

The methodology applied in the analysis of the impacts is a Cost Benefit Analysis (CBA), coupled with qualitative analysis for those components that were impossible to quantify given time and data constraints.

We consider the costs and benefits for the following stakeholders:
- farmers (both options);
- insurance companies (both options);
- the government (both options);
- NARMA (second option only).

We analyze costs and benefits over a time horizon of 10 years. The discount rate used is 7% (with sensitivity analyses performed at 5% and 9%).

After quantifying the expected impacts in each area for each policy option, we determined the expected NPV of both alternatives.

We complemented this partial quantitative analysis with a qualitative analysis based on economic theory, economic literature and empirical evidence from other countries.
The main assumptions used in our quantitative analysis are the following:

GENERAL ASSUMPTIONS

All scenarios are based on the following assumptions:
- The total land of Georgia, area of the crop lands and area of holdings by size are taken from the 2004 Agricultural Census as these are the latest available figures.
- The distribution (share) of small and large farms is assumed to be the same as in the 2004 census.
- We assume that crop land is distributed between large and small farms similarly as the total agricultural land.
- We define small farms as those that possess an area of land up to 5 ha. Large farms are ones with 5 and more ha of land. The estimated average size of crop land for small farmers is 0.48 ha and 19.95 ha for large ones.
- *Maximum insurable crop area.* We assume that 5% of the crop land is located in very high risk zones and will not ever be insured. Therefore, the maximum insurable crop area is 544,013 ha (324,789 ha is held by small farms and 219,224 ha by large farms).
- *Potential demand for insurance[18] in 2014:*
  Small farms – in our baseline scenario we assume that 10% of small farms will be reluctant to change and will not ever be insured. An additional 10% of small farms cannot afford insurance, even at the 93.5% subsidy level. Therefore the potential

---

[18] By potential demand, we mean demand for insurance in the case of a 93.5% subsidy.

demand for insurance for small farms is 80% of their maximum insurable land and equals 259,831 ha.

Large farms – large farmers are usually more aware, more sensitive to quality and information, and more entrepreneurial. So regardless of high subsidy levels, they may be reluctant to insure if they are not satisfied with the quality of insurance products or lack relevant information about them. This is what emerged clearly from our consultations with members of the farmers' association. Some farmers with large land holdings claimed that they did not get insurance because of the lack of preparation of the insurance agent who contacted them. The owners of large farms also have more possibilities to look for alternative sources of risk mitigation. The analysis of 2014 data confirmed that the penetration rate for larger farms was lower than for smaller farms. In order to have a first estimate of the potential demand for agricultural insurance (in ha) with high subsidies (2014) we calculate by how much the penetration rate for large farmers was smaller than that for smaller farmers. The penetration rate for large farmers appeared to be 78% of that for smaller farmers. Therefore, we estimated that, if the potential demand for insurance among small farmers would amount to 80% of the land attributed (according to the assumptions proposed by BFC[19]), the potential demand for insurance among larger farmers would only amount to 63% of the land attributed to them.[20] Therefore, the potential demand of insurance from large farms is 138,111 ha and, total potential demand is 259,831+138,111 =397,943 ha.

- *Responsiveness of demand for crop insurance.* Unfortunately, due to data limitations we were not able to estimate the elasticity of demand for crop insurance (the responsiveness of farms to insurance price changes) using Georgian data.[21] In similar situations it is a standard approach in a RIA to use international experience if some data is missing. In our case, however, the price fluctuations were so wide and the market so different from those for which elasticity estimates were available, that we opted for an alternative approach. We built a small model linking potential demand, and the percentage of premium paid by farmers, calibrating it to predict estimated demand in 2015.

  We use the following procedure to estimate the responsiveness:
  1. Starting from the area estimated in the previous step (potential demand) we built a model linking the level of farmers' contribution to the premium to demand for insurance (in ha);
  2. Finally, taking our estimate of the total area insured in 2015[22] as the upper limit of demand in 2015 (with the new, lower subsidies) we calibrated the model and

---

[19] Among these,10% of small farmers will never insure and 10% could not afford the premium even with a 93.5% average subsidy.

[20] The calculated penetration rates for small and big farms are 3.7% and 2.9% respectively. If we use the assumption that 20% of small farms' land will not be insured, the similar number for large farms' land is: (2.9/3.7)*0.8=63%. We call 2.9/3.7 the correction coefficient.

[21] At least two points of demand are needed to estimate elasticity. We have the insured area and price from the first pilot project, but total insured area in 2014 does not in this case represent real demand as the total amount dedicated to the subsidy was fully used during this phase and not all farms willing to participate in the project were able to do so. As for the data from the second phase of the pilot insurance project, they may be underestimating true demand as the insurance policies issued in 2014 were still valid in 2015 (and those farms who were already insured in 2014 could be interested in buying policies in 2015 with changed conditions).

We also have some historical data of agro insurance in Georgia during 2004-2010, but these data are not useful as they contain only the premium income of insurance companies and paid losses. There is no information about the price paid by farms and area of insured land. Even if we had those data, they would not be useful as 85-90% of the insured crops were grapes (including seedlings) and the results would be biased towards one crop.

[22] It is reasonable to assume that all the small farmers who wanted to insure their land in 2015 at the existing condition could have done so, as part of the budget was left unused. The same cannot be said of large farmers. To cope with this problem, we calculated 78% as how much additional demand would have been generated by large farmers in 2015 if they were half as reactive as small farmers to the price increase. We add these amounts to the demand in 2014 (with better conditions). We take this as

obtained an estimate of the price responsiveness of demand for the two types of farmers (central values). The two values are 1.6 for large farmers and 3.2 for small farmers.[23]

- Normative prices of crops are not changing across years and are the same as in 2015.
- The average (expected) loss ratio is 55%.[24]
- Profit tax is not changing and is equal to 15%.
- *The penetration rate in 2016 and afterwards is determined by the following forces:*
    1. Responsiveness of farmers' demand to the level of contribution required from them.
    2. Insurance experience in the previous year, direct and indirect.
        - Direct effect 1: people who had a negative experience that led them to complain with APMA are assumed not to reinsure in the following year, while those who did not complain are expected to insure again.[25]
        - Direct effect 2: we assume that a fraction of those who insured but were not compensated (because they did not experience any loss or they did but the deductible was larger than the loss) will become skeptical about the usefulness of crop insurance and will decide not to insure in the following year. As the probability of receiving compensation increases with the coverage, we assume the fraction of skeptics is minimal among farmers under the pilot program (with coverage at 90%) and maximum among the larger farmers in Option 2 (an average coverage of 65%). The percentages of skeptics in the baseline analyses are:
            - 20% for all farmers in Option 1;
            - 22.5% for small farmers in Option 2;
            - 25% for large farmers in Option 2;
        - Indirect effect 1: the neighbors of insured farmers are affected in their decision to insure in the following year by the experience of their neighbors. We assume that the probability of having an indirect experience is equal to the percentage of land held by insured farmers divided by the percentage of land held by non-insured farmers, times 4.[26] In the case of a positive experience, we assume (based on evidence in other countries) that about 20% of their neighbors will insure. On the other hand, we assume that none of the neighbors of those having bad experiences will insure.

        - Indirect effect 2: a fraction of the neighbors of "skeptics" refrain from insuring, diminishing the potential (positive) spillover of positive experiences. This fraction is calculated in the same way as in the case of positive experiences.

---

the total demand in 2015. We say this represents the upper level of demand because it is not certain that all those subscribing in 2014 would have done so in the 2015 conditions.

[23] This implies that if the premium share paid by the farmers increased 5 times (up to 32.5% from the initial 6.5% in 2014, at which we assumed demand could reach its potential value) demand would be equal to the potential demand divided by 16 for small farmers and by 8 for larger farmers. We performed sensitivity analyses for different levels of initial potential demand and for different values of relative responsiveness of smaller farmers to larger farmers without any significant change in the patterns observed in the baseline analysis.

[24] The loss ratio is the ratio of total losses incurred in claims plus adjustment expenses divided by the total premiums earned.

[25] The total number of complaints for the pilot agricultural insurance project is 867 (up to 1 September 2015). This means that 3.55% of insured farmers were not satisfied. Source: APMA data.

[26] In practice, we assume that each farmer has an average of four neighbors.

ASSUMPTIONS SPECIFIC TO POLICY OPTION 1

The baseline scenario is the situation under which the status quo (the ongoing pilot insurance project) continues for 10 years. Under this scenario no major changes are introduced. Therefore, the current trends in the agricultural insurance market persist.

The main assumptions of the baseline scenario are the following:

- The subsidy rates do not change during 2016-2025 (staying in the 50-70% range, which amounts to 65% on average).
- There is no money invested in awareness campaigns by the government.
- Insurance companies are not required to expand their sale and service capacities.
- The deductible is 10% of the total sum insured.
- Total premiums received by insurance companies (subsidy + farmers payments) amount to 15%[27] of the total sum insured.
- In the starting year, insurance companies' operational and administrative costs amount to 24% of the total premiums collected (including the cost of loss adjustment activities) and reinsurance costs equal 5% of collected premiums. The resulting profit margin is 16% (taking into consideration a target loss ratio of 55%). As time passes, the cost structure of insurance companies changes, as they have to cover more and more farmers. We assume that their operational costs in 2025 amount to 27% of collected premiums and this will happen as a gradual increase over the 10-year period. The percentage share of payments to reinsurers does not change. Thus, in 2025 the profit margin of insurance companies is 13%.
- Insurance companies are receiving reinsurance commissions back from reinsurers and the amount is estimated to be 20% of reinsurance payments.
- The running costs of the agricultural insurance project do not change across the years and are the same as in 2015.
- There is no limit on the subsidy amount from the government side.
- There is no restriction on the maximum size of land plots that could be subsidized.

The latter two assumptions are deviations from the ongoing pilot project. We removed the restriction on the maximum size of land plots that could be insured based on interviews with the major stakeholders, as those restrictions were quite artificial and do not necessarily correspond to the division of commercial and non-commercial farmers. We do not consider a ceiling on the subsidy amount in order to catch unrestricted growth in penetration rates and see the maximum potential benefits with the current subsidy rate's setup.

ASSUMPTIONS SPECIFIC TO POLICY OPTION 2

This option relies on the following specific assumptions:

- In the alternative scenario subsidy levels change and are different for small and large farmers. They gradually decrease from 75% to 65% for small farmers and from 60% to 50% for large farmers. Changes in the subsidy level happen during the first four years. Afterwards, subsidy levels are fixed at 65% for small farmers and 50% for large farmers during the last six years of the analysis.

---

[27] This premium rate is extrapolated from international practice.

- Coverage levels are different for small and large farmers and equal 85%[28] and 65%[29] respectively, resulting in 15% and 35% deductibles for small and large farmers. Coverage levels do not change over the period of 10 years.
- Premium rates are different for large and small farmers and equal 8%[30] and 13.5%[31] respectively. However, they do not change across the years.
- A target loss ratio of 55% is assumed in the calculations and this will not change either.
- It is assumed that the NARMA fee is 12% of total premiums (of which 5% is the cost of loss adjustment) collected by insurance companies, whereas payments to reinsurers constitute 4% and the operating and administrative costs of insurance companies account for 19% of total premiums collected. This results in a 10% profit margin for insurance companies.
- Reinsurance commissions going back to NARMA are estimated at 20% of reinsurance payments. The loss adjustment costs for NARMA equal 5% of premiums collected by insurance companies.
- As satisfaction with insurance increases, penetration rates increase due to the improved quality of service.
- The number and quality of insurance agents will increase, which leads to an improved quality of service and a reduced level of dissatisfaction.
- The media has an impact on the awareness of farmers about agricultural insurance and their decision-making.
- Insurance companies are required to expand their sale and service capacities in order to be allowed to participate in the program.

B. ANALYSIS OF IMPACTS

Table 7 below presents a summary of the qualitative impact analysis.

Table 7. Summary impact of selected options

IMPACT	OPTION 1	OPTION 2
Administrative	APMA has to ensure that necessary resources are available for: (i) developing standardized agricultural insurance products; (ii) distributing premium subsidies to private insurance companies; and (iii) monitoring proper use of premium subsidies. Insurance products with a lower deductible level (products to be offered to small farmers) will require higher administrative costs than products with a higher deductible (products to be offered to large farmers). The reason for this is that the former product will have to issue contracts to the high number of small farmers. In addition, the low deductible of	In the agricultural insurance market, relatively high administration costs are associated with product development and loss adjustment. NARMA, as a centralized body, will provide crucial infrastructure elements such as comprehensive databases, standardized insurance products, loss adjustment methodology and capacity, distribution of premium subsidies and monitoring of their use, and access to reinsurance (BFC, 2015).

---

[28] This is an average of the 80% and 90% coverage levels suggested by BFC for small farmers.
[29] This is an average of the 60% and 70% coverage levels suggested by BFC for large farmers.
[30] This is an average of the 7% and 9% premium rates suggested by BFC for large farmers in the case where coverage is 60% and 70% respectively.
[31] This is an average of the 12% and 15% premium rates suggested by BFC for small farmers in the case where coverage is 80% and 90% respectively.

	these products will result in many frequent indemnity payments. Overall, the administrative requirements are less heavy in this option compared with the alternative scenario.	
Economic	**Crop insurance and farm diversification:** Literature is inconclusive about the effect of crop insurance on farm economic performance. The positive impact of crop insurance on farm returns might occur via the following path: farm diversification is considered as one of the main mechanisms for coping with risk. Therefore, it is expected that farmers who purchase insurance will decrease their level of diversification. At the same time, studies (Katchova, 2005; O'Donoghue et al., 2009) show that expected returns are higher in more specialized farms. Therefore, if insurance decreases the degree of farm diversification, it will positively affect farm returns. However, farmers diversify their production not only because of risk. Crop rotation brings agronomic benefits too. Famers have capital and labor constraints and planting multiple crops might be an optimal farm decision (O'Donoghue et al., 2009). In Georgia, in most cases issues other than risk related factors can motivate farm diversification. About 90% of Georgian farmers are subsistence farmers, producing multiple crops to cover a household's need for food. If insurance increases farm income, farmers might be able to buy more food, and they might specialize in cultivating particular crops for the market. This might advance the commercialization of farmers, further improving their economic performance without increasing (and potentially decreasing) their vulnerability to negative shocks. **Crop insurance and investment in better technology:** A study by Walters and Preston (2013) shows that there are considerable risk reduction benefits of insurance for US farmers. According to this study, purchasing crop insurance provides a $292.2 per acre reduction in tail risk.[32] Therefore, a producer can release these dollars from working capital and use them for other investments, having a positive impact on the farm economy (Walters and Preston, 2013). Though actual investment decisions will depend on different factors, the results of Walters and Preston (2013) hint at the positive impact of insurance on Georgian	Similar impacts are expected for this option. However, NARMA's potential contribution might be higher for most expected impacts. NARMA will offer more professional (dedicated) management of the system, provision of better infrastructure, the design of better products, and the enforcement of higher quality standards.

[32] Tail risk is the risk that an investment will change by more than three standard deviations from its mean.

	farmers' investments in better production technologies. **Insurance and agricultural output:** Expected farm incomes are higher on insured land, because of increased investments and a reduced risk of losses. This might incentivize farmers to cultivate unused agricultural land. Therefore, larger areas under insurance will contribute to the increased value of agricultural production. Reduction in farm production risk is associated with savings that might be invested in higher value added agricultural activities (e.g., high-value crops, vertical integration in the value chain). **Insurance and access to finance:** Studies show that insurance might contribute to an increase in farmland values (Ifft et al., 2014). Using higher valued land as collateral might contribute to improve farmers' access to finance. **Business expansion of insurance companies:** As penetration rates become higher and total collected premiums increase, it is expected that the share of agricultural insurance in the total portfolio of companies will also increase. However, this will depend on the overall business growth experienced by insurance companies.	
Social	Agricultural insurance is seen by many governments as an important income stabilization instrument. A developed agricultural insurance market is expected to contribute to the reduction of farmers' financial vulnerability by: (a) increasing their expected incomes; and (b) reducing their income volatility. According to the literature, crop insurance tends to increase farmers' income but the impact on income volatility is ambiguous. In some cases, volatility might even be increased. Work by USDA (1999) suggests that crop insurance slightly increases average returns for most farmers because they are subsidized. The same study shows that risk minimization tools, including crop insurance, tend to reduce intrayear income uncertainty, but have only small or negligible effects on multiyear uncertainties (USDA, 1999). A study by Enjolras et al. (2014) investigates the relationship between income return and insurance for farmers in Italy and France, finding a positive relationship in both countries. The same study also measures the extent to which crop insurance reduces the crop income volatility of farmers. According to their results, for Italian farmers these tools stabilize crop income over the years, even if some differences with farm specialization	Similar impacts (as in Option 1) are expected for this option. However, this option might result in accumulating better experiences for farmers (with regard to loss adjustments and loss indemnifications). This might lead to a higher number of insured farmers, implying the better contribution of this option to the reduction of the financial vulnerability of farm households. Moreover, the progressive reduction in government subsidies per ha associated with this option might allow the extension of subsidies to a larger number of subsistence farmers without exerting excessive pressure on the public budget.

	exist (Enjolras et al., 2014). However, the same study found that on French farms insurance increases income volatility. The authors explain these results by the fact that Italian farms are smaller than French farms, and thus more exposed to changes in their incomes. Therefore, insurance contributes to smoothing Italian farmers' income fluctuations (Enjolras et al., 2014). As most Georgian farmers are small scale (and most will probably remain relatively small in the future) the insurance program might contribute to achieving this objective.	
Environ-mental	Climate change might exacerbate crop risks. In Georgia, the frequency of catastrophic weather events (floods and droughts) has increased over the past two decades (World Bank, 2014: 94) and might continue to increase in the future. This might lead to higher crop losses experienced by farmers. Therefore, the importance of insurance as a complementary risk mitigation mechanism (along with other tools) will increase. Although the literature is not conclusive about the impact of crop insurance on environmental quality, the following impacts are possible (Sumner and Zulauf, 2012): 1) Insurance programs might result in less diversification of crops, possibly threatening agrobiodiversity in the future. 2) Insurance might incentivize farmers to cultivate marginal land, which would not otherwise be considered for cropping. This will possibly induce more environmental problems (e.g., wind and water erosion). 3) Since insured farmers have a reduced risk of losses, they might use fewer alternative risk mitigation strategies and also intensify their production (increase input use). The above mentioned aspects might be less relevant in Georgian context at this stage: farmers plant a variety of crops; a lot of agricultural land is not cultivated yet; and most Georgian farmers use low-input technology. Nevertheless, in the course of increasing agricultural productivity in Georgia, potential environmental threats associated with subsidized insurance programs should be kept in mind.	A similar impact as for Option 1 is expected for Option 2. However, because of its better capacity to monitor the quality of the whole program, NARMA might have some positive impact. Several agronomists and farmers will become familiar with loss adjustment standards (and also with some best practices in agriculture). This might lead to better dissemination of knowledge about more environmentally friendly agricultural practices among farmers. However, it is also possible that loss adjusters advise farmers to use more inputs (e.g., fertilizers) which might impair the environment. In order to sell more insurance products, sale agents might even recommend farmers plant on marginal land, possibly compromising environmental quality. Therefore, the long term impact of insurance on the environment is uncertain.
Public financing	The GoG will have the following costs: (i) the amount to be paid as premium subsidies; (ii) APMA's costs for managing the pilot project (product development, subsidy distribution, monitoring), and (iii) marketing costs. The GoG will benefit in several ways from the development of the agricultural insurance market: 1. If the agricultural insurance market is developed and expanded,	The GoG will have the following costs: (i) the amount to be paid as premium subsidies and (ii) NARMA set up costs. In addition to the general benefits associated with the development of the agricultural insurance market (as discussed for Option 1), the government will benefit in several ways from the NARMA model: • It will save costs associated with administration and management of

	government will receive higher profit taxes from farmers and insurance companies. 2. In 2013, GoG spent 488 million GEL to support the country's socially vulnerable population[33] (SSA, 2015). At the same time, about 43% of Georgia's population lives in rural areas and most of them are engaged in farming activities. If the agricultural insurance program manages to increase the expected income of farms and reduce their financial vulnerability, less governmental transfers to poor farm households will be necessary. 3. The existence of agriculture insurance will reduce the amount of ad hoc payments necessary after catastrophic events. By developing the insurance market, government transfers famers' risks to the insurers and there is no need to reserve governmental funds for ad hoc payments (or lower reserves will be necessary). The unblocked funds could be put to more productive uses, rather than holding them as a contingency in government accounts.[34] In addition, having a developed insurance system is more transparent compared to ad hoc payments.	the program (product development, subsidy distribution and monitoring). These costs will be covered by the NARMA fee paid by insurance companies (12% of the collected premiums). • The NARMA fee will cover the costs of awareness and marketing campaigns. • The NARMA fee will also be used for the technical assistance needed after the completion of the PAFAI project (e.g., further training and certification of loss adjusters). • NARMA might operate a catastrophic fund (CAT). NARMA's income that is not spent on loss adjustment and administration functions (in case of "good years") might be added to this fund. It is suggested that ad hoc disaster relief payments outside the scheme should be discontinued (or to be made less attractive) in this option (BFC, 2015). This will assure that farmers get timely and secure reimbursement in the event of large systemic losses.
Other (e.g., new jobs and skills)	Agricultural insurance reform will generate new jobs: • staff involved in managing the program (APMA's current staff and new hires) • more IT personnel • more loss adjusters • more sale agents	In Option 2 similar jobs (as discussed for Option 1) will be generated, but the skills might be taken to a higher level: • NARMA staff (including IT) will be selected, trained and dedicated to the agricultural insurance program. • A pool of well-trained agricultural loss adjusters (30 in 2016 and 130-150 after five years) will be generated. • Sale agents dedicated to agricultural insurance. The training of loss adjusters will not only develop loss adjustment skills but they will also learn about proper agricultural practices and share this knowledge with farmers.

High impact	Medium impact	Low impact

---

[33] Pecuniary Social Assistance (Subsistence Allowance) http://ssa.gov.ge/

[34] http://www.riice.org/what-riice-does/reducing-farmers-vulnerability/

C. COST-BENEFIT ANALYSIS

OPTION 1: THE GOVERNMENT DOES NOT INTRODUCE NARMA BUT CONTINUES WITH THE CURRENT PILOT (BASELINE SCENARIO).

The main stakeholders considered in this option are farmers, insurance companies and the government.

OPTION 1: COSTS

We consider costs and benefits for the following stakeholders: insured farmers, insurance companies, and the government. In addition, we also account for the period when these costs and benefits are paid or received.

Insured farmers. The costs of insured farmers include premiums paid. Farmers are paying premiums in advance, at the beginning of the year, while crop losses are known at the end of the period.

Insurance companies. The costs of insurance companies include indemnities, which are payments to farmers affected by negative perils (which we assume to be 55% of total premiums collected), administrative and operational costs, profit taxes and payments to reinsurers.[35] All costs are paid by insurance companies at the end of each period.

Government. The costs of government are represented by the premium subsidy paid to insurance companies and the running costs of the project. The latter cost category is paid at the end of the year, while premium subsidies are collected in the beginning.

OPTION 1: BENEFITS

Insured farmers. Payments received from insurance companies in the case of negative events are benefits for insured farmers. In our analysis, these benefits amount to 55% of total premiums collected each year, based on the loss ratio assumption.

Insurance companies. The benefits of insurance companies are premiums collected from farmers, subsidies paid by the government and reinsurance commissions.

Government. Government is receiving profit taxes as a benefit, which represents 15% of the profits of insurance companies.

We are not able to quantify a large part of the benefits associated with crop insurance. These will be dicussed in the qualitative part of this report. Agricultural insurance is the primary risk management tool farmers in developed agricultural sectors use to financially recover from natural disasters and volatile market fluctuations; to pay their bankers, fertilizer suppliers, equipment providers and landlords and purchase their production inputs for the next season.

---

[35] Consultations and interviews with insurance companies showed that there is a precedent of agricultural reinsurance in the market. We assume reinsurance payments to amount to 5% of total premiums collected and they will be paid starting from 2016.

Agricultural insurance gives them the confidence to make longer term investments that will increase their production efficiency.

OPTION 1: RESULTS

Farmers. We have estimated demand for insurance starting from our estimated potential demand, adjusted for the responsiveness of farmers to insurance prices and their satisfaction level. We also took into consideration indirect effects – the learning experiences (positive or negative) from neighbors. The results of the estimations are presented below (Table 8).

Table 8. Predicted demand for agricultural insurance in the baseline scenario

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
# of small farmers insured	31,501	34,067	36,869	39,936	43,298	46,990	51,056	55,544	60,511	66,027
# of large farmers insured	804	887	1,004	1,122	1,253	1,400	1,567	1,756	1,974	2,213
Amount of land insured by small farmers	15,080	16,308	17,649	19,117	20,726	22,494	24,440	26,589	28,967	31,607
Amount of land insured by large farmers	16,031	17,686	20,027	22,372	24,989	27,928	31,248	35,027	39,366	44,149
Penetration rate in terms of land	5.7%	6.3%	6.9%	7.6%	8.4%	9.3%	10.2%	11.3%	12.5%	13.9%
Penetration rate in terms of farmers	4.5%	4.8%	5.2%	5.7%	6.1%	6.7%	7.3%	7.9%	8.6%	9.4%

Note: These figures correspond to the beginning of each year.

The maximum achievable penetration level in terms of land with the current subsidy rates and insurance quality is 13.93% in 2025. The same figure in terms of number of farmers is 9.40%. The increase in penetration is moderate, regardless of the fact that there is no subsidy limit from the government side. This result is comparable with international experience. Evidence from several countries shows that participation rates are sub-optimal and grow slowly, even

with heavy government subsidies.[36] Existing research shows that low take-up rates depend not only on government subsidies, but also on factors like trust, credit constraints, ambiguity aversion and social networks.[37]

Insurance companies. Estimated total premiums received by insurance companies from farmers and government are presented in the table below. Premiums are collected in advance, which is why the estimation of benefits for insurance companies start in early 2016 (at the end of 2015). We ignore farmers who are willing to insure in 2025 without government subsidies, as their reimbursement will take place in 2026. In the baseline scenario the total premiums collected increase substantially, more than doubling, together with insurance companies' profits.

Table 9. Total premiums[38] collected (mln. GEL)

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
28.0	30.6	33.9	37.3	41.1	45.4	50.1	55.5	61.5	68.2

Note: These figures correspond to the beginning of each year.

Total premiums collected by insurance companies are growing each year and they reach 68.2 mln GEL in 2024. Based on our assumptions, insurance companies' profit margins decrease from 16% of total premiums collected to 13% during the period.

Government. With the set up of Option 1, government has to gradually increase the subsidy amount to 44.3 mln GEL in 2024, as more and more farmers are willing to participate in the project.[39] Only a small fraction of the subsidy amount is returned back in the form of profit tax.

Table 10. Profit tax and subsidy amount (mln GEL)

Year	2016*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Profit tax	-	0.7	0.8	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.5
Subsidy amount	18.2	19.9	22.0	24.3	26.7	29.5	32.6	36.0	40.0	44.3	-

*Note: * denotes beginning of the year*

---

[36] For example, Giné et al. (2008); Cole et al. (2011); Bryan (2010).

[37] Jing Cai et al. (2013).

[38] Total premiums represent the summation of government subsidies and premium payments received from farmers.

[39] In the scope of this study an interactive tool was elaborated in excel format. It gives policy makers the possibility to determine the subsidy amount in advance (based on budget constraints) to see how it affects different variables. Particularly penetration rates in terms of land and number of farmers, the cost and benefits of farmers, insurance companies and the government.

The NPV of the net benefits for all considered stakeholders are presented below (Table 11). It is positive for all parties except government, as was expected as the government is the party paying subsidies that does not have any major quantifiable benefits.

Table 11. NPV of net benefits for all stakeholders (GEL)

NPV of net benefits for small farmers	23,631,404
NPV of net benefits for large farmers	29,058,456
NPV of insurance companies	60,755,237
NPV of the government	-202,786,333

*Note: * denotes beginning of the year*

OPTION 2: GOVERNMENT ADOPTS AND DEVELOPS THE NARMA MODEL

The main stakeholders considered in this option are farmers, insurance companies, the government and NARMA.

OPTION 2: COSTS

Farmers. The same categories of costs as in Option 1, but the values differ because of different assumptions.

Insurance Companies. As in Option 1, the costs of insurance companies include indemnities, which are payments to farmers affected by negative events, administrative and operational costs (sales agents, etc., but, in this case not loss adjustments, which are taken over by NARMA), and profit taxes paid to government as well as payments to reinsurers. Administrative and operational costs increase with the increase in collected premiums. In this scenario, administrative and operational costs (net of loss adjustment costs) are lower than in the baseline scenario (19% vs. 24-27% of total premiums). As for reinsurance costs, in this scenario NARMA offers reinsurance through risk pooling by creating a National Agricultural Insurance Pool (NAIP) and helps insurance companies to get better reinsurance conditions than companies would get without NAIP. Reinsurance costs are covered by insurance companies and they increase as the size of the portfolio increases. Other costs of insurance companies include the NARMA fee and membership fee. The NARMA fee is estimated at 12% of collected premiums (including 5% to cover the costs of loss adjustment).

Government. The costs of the government are represented (as in Option 1) by subsidies, increasing with the penetration rate. In addition, in this case, in our analysis the government costs include the NARMA set up cost.

NARMA*.* The costs of NARMA include HR costs, equipment and software, overheads, operational and loss adjustment costs, as well as the distribution of state subsidies to partner insurance companies. The latter is equal to the government premium subsidy because in this case NARMA acts as a channel between insurance companies and the government. State subsidies are first transferred to NARMA and then NARMA transfers them to insurance companies (net of its compensation).[40] The amount paid by the government to subsidize farmers is a function of the penetration rate, as in Option 1.[41]

OPTION 2: BENEFITS

Farmers. These have the same categories of benefits as in Option 1, but values differ because of different assumptions.

Insurance companies. The benefits of insurance companies are represented by premiums collected from farmers and NARMA.

Government. As for government benefits, the government budget benefits by the amount of profit taxes received from insurance companies. Although profit taxes are a fixed percentage of insurance companies' premiums, the amount of profit taxes raises when the size of the portfolio (collected premiums) increases.

NARMA. NARMA's benefits in our analysis include start-up funds/equity, reinsurance commissions, premium subsidies from the government, and premium income – which is a NARMA fee and equals 12% of the premiums collected by insurance companies. NARMA costs are fully covered by the NARMA fee paid by insurance companies.

OPTION 2: RESULTS

Farmers. This option generates higher penetration rates in terms of both insured farmers and insured land, with respect to the baseline scenario. During the first five years of implementation, the amount of insured land reaches 37,375 ha, which is 6.87% of the total insurable area. The amount of insured land increases to 77,946 ha (14.33%) by the tenth year. As for the number of farmers insured, by the fifth year of implementation, it reaches 51,323 farmers (7.07%) and 107,743 (14.85%) by the tenth year.

---

[40] All NARMA costs, except for the amount of subsidies distributed to insurance companies, come from the NARMA simulation model developed by BFC.
[41] Our estimated penetration rates differ from those obtained by the NARMA simulation by BFC.

Table 12. Key indicators for farmers

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Number of small farmers insured	44,102	47,864	52,713	48,890	50,665	55,552	64,231	75,094	88,820	106,389
Number of large farmers insured	703	771	772	636	658	723	838	978	1,150	1,355
Amount of land insured by small farmers (ha)	21,111	22,912	25,234	23,404	24,253	26,593	30,747	35,948	42,518	50,928
Amount of land insured by large farmers (ha)	14,027	15,378	15,402	12,681	13,122	14,413	16,712	19,508	22,939	27,018
Penetration rate in terms of land	6.5%	7.0%	7.5%	6.6%	6.9%	7.5%	8.7%	10.2%	12.0%	14.3%
Penetration rate in terms of # of farmers	6.2%	6.7%	7.4%	6.8%	7.1%	7.8%	9.0%	10.5%	12.4%	14.9%

Note: These figures correspond to the beginning of each year.

Despite lower subsidies than in Option 1, these relatively high penetration rates are achieved thanks to improved loss adjustment procedures and more qualified sales agents, which will lead to increased satisfaction of farmers with insurance. The latter translates into increased demand for insurance and higher penetration rates than could have been obtained otherwise.

Insurance companies. As penetration rates increase over time, so do collected premiums. Premiums grow from 23.8 mln GEL to 54.2 mln GEL over 10 years. Since the portfolio significantly increases over time (by more than 50%), insurance companies are likely to become more interested in agricultural insurance and invest more in the improvement of service quality. It is important to note, however, that in this scenario the total amount of premiums collected by insurance companies is significantly lower than in the baseline scenario (as, therefore, are insurance companies' profits).

Table 13. Premiums Collected by Insurance Companies (mln. GEL)

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
23.8	25.9	27.8	25.0	25.9	28.5	32.9	38.5	45.5	54.2

Note: These figures correspond to the beginning of each year.

Government. As penetration rates increase, so does government spending because all premiums are subsidized at least 50% for large farmers and 65% for small farmers. Over the period of 10 years state subsidies, starting from 16.9 mln GEL, will reach 33.3 mln GEL. Since the collected premiums increase, the government generates more income in profit tax. However, the increase in state subsidies offsets the increase in profit tax and the overall net benefit for the government is negative.

Table 14. Key figures for the Government (mln. GEL)

Indicator	2016*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Profit tax	-	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8
Subsidy	16.9	18.3	18.4	15.4	15.9	17.5	20.2	23.6	27.9	33.3	-

*Note: * denotes beginning of the year*

NARMA. Given its structure of costs and benefits, NARMA appears to be a sustainable body, which generates enough income to cover its costs (like HR, overhead and operational costs). The main source of income for NARMA is premium income (the NARMA fee), a de facto transfer from insurance companies.

Table 15. Key figures for NARMA (mln. GEL)

Indicator	2016*	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total revenues	17.7	21.4	21.7	18.9	19.1	20.8	23.8	27.8	32.8	39.1	6.9
Total costs	17.2	20.1	20.3	17.6	18.0	19.6	22.5	26.1	30.7	36.4	3.6

Reinsurance commission is another source of income for NARMA, but it is much lower than premium incomes.

Taking into account all monetized costs and benefits, we calculated the NPV for farmers (both small and large), insurance companies, the government and NARMA.

Table 16. NPV of net benefits for stakeholders (GEL)

NPV of net benefits for small farmers	33,094,087
NPV of net benefits for large farmers	2,519,179
NPV of insurance companies	34,007,490
NPV of the government	-147,199,362
NPV of NARMA	12,073,813

As can be concluded from the table above, as in Option 1, the NPV of net benefits is positive for all stakeholders except the government. This is not surprising because the government costs (subsidies) are much higher than its benefits (profit tax). The government is de facto subsidizing the program and transferring net resources to all other stakeholders involved.

D. SUMMARY

The costs and benefits of options 1 and 2 are presented in Table 17. Option 2 generates more benefits than Option 1. However, the costs of implementing Option 2 are also higher than costs of implementing Option 1. Option 2 generates more net benefits than Option 1.

The NPV of net benefits is negative for both scenarios, because both options require high government costs in the form of subsidies. Option 1 generates higher net benefits for large farmers and insurance companies, together with high costs for the government; whereas Option 2 provides more benefits to small farmers and less costs for the government. Small farmers are better off in Option 2 and large farmers are better off in Option 1.

There are also a number of other unquantified impacts that are relevant for our analysis:

- The introduction of a law on agricultural insurance creating a legislative basis for the development of agricultural insurance.
- Reduction of households' exposure to weather-related risks.
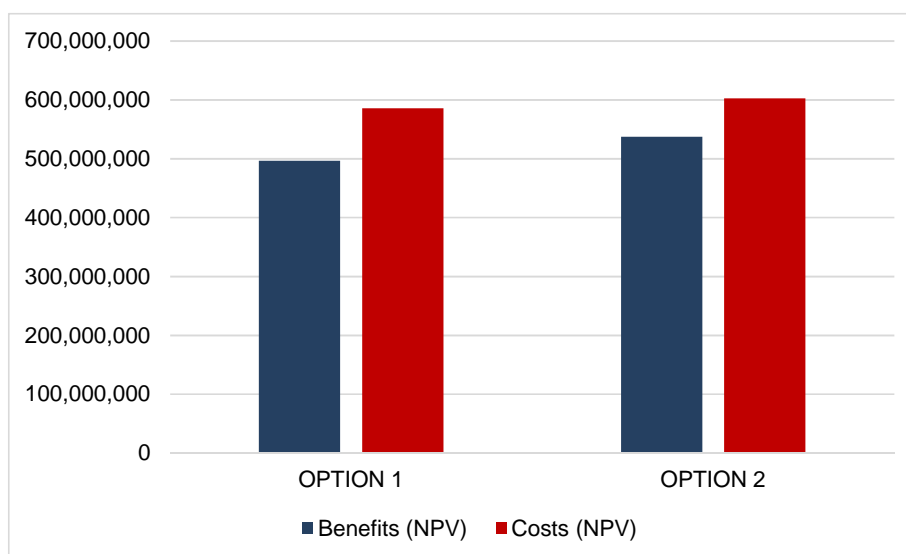- Better access to microfinance for households etc.

More details are provided in the table below:

Table 17. Summary of costs and benefits

	OPTION 1 (Pilot with Fixed Subsidy Level)	OPTION 2 (NARMA with Decreasing Subsidy Level)
Benefits (NPV)	496,383,033 GEL	537,298,179 GEL
Costs (NPV)	585,724,270 GEL	602,802,971 GEL
Benefits – Costs (NPV)	-89,341,237 GEL	-65,504,792 GEL
Quantified but not monetized impact	NA	NA
Qualitative impacts (if quantitative not possible)	- Financially recover from natural disasters; - Less income volatility enabling farmers to pay bankers, fertilizer suppliers, equipment providers and landlords in a timely fashion, as well as purchase production inputs for the next season. - Confidence to make longer term investments that will increase production efficiency.	- Financially recover from natural disasters; - Less income volatility enabling farmers to pay bankers, fertilizer suppliers, equipment providers and landlords in a timely fashion, as well as purchase production inputs for the next season. - Confidence to make longer term investments that will increase production efficiency. - Existence of institutional establishment of agricultural insurance (law on agricultural insurance etc.)

Figure 5 helps visualize the monetized impacts better.

Figure 5. Comparison of costs and benefits of major policy options (NPV, GEL)

Most of the above mentioned costs and benefits are just transfers from one stakeholder to another, with the exception of real administrative and operational costs and of payments to international reinsurers. Because of this, the final net benefits for society depend on those costs and benefits that are not cancelled out when all costs and benefits are aggregated across all stakeholders.

UNCERTAINTIES
Since the costs and benefits of stakeholders depend on our assumptions, there are uncertainties that might affect the costs and benefits if the parameters change. One such parameter is the loss ratio. If the loss ratio is higher than the 55% assumed, this would result in higher benefits for farmers, but higher costs for insurance companies. Another uncertainly is related to the start-up cost of NARMA. In our analysis, we assume that the start-up costs of NARMA are financed by the government, however if the government shares this cost with some other stakeholders, the government costs decrease.

SENSITIVITY ANALYSIS

Sensitivity analysis was done in order to check the robustness of results with regard to changing parameters. The following scenarios were considered in the framework of sensitivity analysis:
- High and low potential demand.
- High and low relative responsiveness of small farmers.
- High and low skepticism.
- High and low quality improvement.
- Strong and weak feedback.
- Option 1*: decreasing government subsidies during the 10 years in the pilot scenario. The reason for this assumption is the same as discussed above. The level of subsidy in the pilot scenario is decreasing in the same way as in the NARMA case. Its level in 2015 and 2016 is 65%, in 2017 it is 60% and in 2018 and afterwards it is 55% for all farmers.
- Option 2*: fixed government subsidies for small and large farmers during 10 years in the NARMA scenario. We fixed government subsidies for small and large farmers at a medium level based on BFC's report. There is a 70% subsidy for small farmers and 55% for large farmers. The subsidy level is fixed in order to make the NARMA scenario with a fixed subsidy level comparable with the pilot scenario with a fixed subsidy level.

Analysis showed that feedback and the level of skepticism are the most important determinants of farmers' demand on insurance. Fixing subsidies also has a significant positive effect on penetration rates, because the level of skepticism associated with the change of subsidies decreases when they become fixed. Farmers are more satisfied with insurance if the subsidies are not changing frequently.

VII. COMPARING THE OPTIONS

Table 18 shows the results for major Options 1 and 2 as well as the results for options modified with respect to the subsidy level (Options 1* and 2* described in the previous sensitivity analysis section).

Table 18. Summary of Cost-Benefit Analysis

INDICATORS	OPTION 1 (Pilot with Fixed Subsidy Level)	OPTION 2 (NARMA with Decreasing Subsidy Level)	OPTION 1* (Pilot with Decreasing Subsidy Level)	OPTION 2* (NARMA with Fixed Subsidy Level)
Benefits – costs (NPV)	-89,341,237 GEL	-65,504,792 GEL	-67,195,728 GEL	-71,879,478 GEL
NPV of net benefits for small farmers	23,631,404 GEL	33,094,087 GEL	19,609,537 GEL	39,000,475 GEL
NPV of net benefits for large farmers	29,058,456 GEL	2,519,179 GEL	20,230,411 GEL	4,968,425 GEL
NPV of insurance companies	60,755,237 GEL	34,007,490 GEL	46,212,684 GEL	37,640,123 GEL
NPV of the government	-202,786,333 GEL	-147,199,362 GEL	-153,248,360 GEL	-167,390,350 GEL
NPV of NARMA	-	12,073,813 GEL	-	13,901,848 GEL
Penetration rate in terms of land	13.93%	14.33%	8.94%	18.54%

Farmers generate the highest benefits under Option 2*, which is NARMA with a fixed subsidy level. In this scenario, small farmers are better off than in any other option. Large farmers are better off in the Option 1 (the pilot with a fixed subsidy level). This can be explained by the higher subsidy level for large farmers in the pilot compared to the NARMA scenario and a lower deductible, which translates into lower skepticism.

Insurance companies are better off in the case of the pilot, because in the case of NARMA additional costs, such as the NARMA fee, have to be incurred by insurance companies. It should be noted that Option 1, where insurance companies generate the highest benefits, is the most costly for the government.

The government spends less in the case of NARMA with decreasing subsidy levels.

NARMA is a sustainable body in the case of both the fixed and decreasing subsidy levels. However, it has higher benefits when the subsidy level is fixed.

The NARMA scenario with a fixed subsidy level (Option 2*) generates the highest penetration rate in terms of insured land.

In addition to **NPV**, we used the following criteria for comparing the two policy options.

- **Effectiveness 1**.This criterion evaluates the contribution of the policy option to the development of the agricultural insurance market in Georgia (achieving general objective 1). More specifically, it evaluates the capability of the policy option to assure:

  a. Increased demand for agricultural insurance.

  b. Development of affordable insurance products for farmers.

  c. Improved technical capacity for loss adjustment, product development and delivery .

  d. Expansion of the agricultural insurance business.

  e. A reduced degree of information asymmetry in the market and increased data availability.

- **Effectiveness 2**. This criterion evaluates the contribution of the policy option to supporting agricultural production and increasing the competitiveness of farmers and agro business (achieving general objective 2). More specifically, it evaluates the capability of the policy option to assure:

  a. Increased value of agricultural production.

  b. Increased investments in agricultural production.

  c. Increased access to finance.

- **Effectiveness 3**. This criterion evaluates the contribution of the policy option to support of the incomes of people involved in agricultural production and to minimize their risks (achieving general objective 3). More specifically, it evaluates the capability of the policy option to assure:

  a. Reduced financial vulnerability of farmers.

  b. A smoothed income fluctuation in agricultural areas.

- **Feasibility/Ease of complicance**. This criterion assesses how easy it is to realize the policy option. This includes the administrative burden, the challenges to set up new institutions, the possible scarcity of resources and the adequate quality (e.g., scarcity of financial resources, capacity of program managers, number of loss adjusters and their objectivity) to cope with a complex program, and successfully implement the policy reform.

- **Minimization of risks associated with the reform**. This criterion evaluates the capacity of the option to minimize the undesired negative impacts of the reform not monetized in the CBA. The reform might be associated with undesirable negative impacts on the social and environmental aspects of agricultural production. A subsidized insurance program is expected to play a large role in the framework of social farm nets. A possible increase in farmland values as the result of insurance might involve the risk of increased income inequality. Moreover, cultivating marginal lands (e.g., using pasture land for crops) might be associated with environmental risks.

- **Maximizations of collateral benefits associated with the reform**. This criterion evaluates the capacity of the option to maximize the positive impacts from the reform not monetized in the CBA. The positive externalities generated by the reform, such as developing an agricultural insurance culture for all stakeholders, improving data

availability and quality, and accumulating methodological knowledge, are included in this criterion.

When comparing the policy options, we gave equal weight to each criterion. This was motivated by the results of stakeholder consultations and workshop discussions, outlining the equal importance of all policy objectives as well as the different aspects related to other criteria.

A. SUMMARY OF OPTIONS

Table 19 shows that Option 1 is inferior to Option 2 according to most criteria.[42]

Table 19. Comparison of options using multi-criteria analysis

EVALUATION CRITERIA	OPTION 1 (Pilot with Fixed Subsidy Level)	OPTION 2 (NARMA with Decreasing Subsidy Level)	OPTION 1* (Pilot with Decreasing Subsidy Level)	OPTION 2* (NARMA with Fixed Subsidy Level)
Benefits – costs (NPV)	-89,341,237 GEL	-65,504,792 GEL	-67,195,728 GEL	-71,879,478 GEL
Effectiveness 1	+ +	+ + +	+ +	+ + +
Effectiveness 2	+.	+	+	+
Effectiveness 3	+ +	+ + +	+ +	+ + +
Feasibility / Ease of compliance	+ +	+ +	+ +	+ +
Minimization of risks associated with the reform	+ +	+ + +	+ +	+ + +
Maximizations of collateral benefits associated with the reform	+ +	+ + +	+ +	+ + +
SUMMARY	**+ +**	**+ +/+ + +**	**+ +**	**+ +/+ + +**

Note: Option 1 and Option 2 are the major options, whereas Option 1 and Option 2* show the results of sensitivity analysis.*

The NPV of net benefits is higher for Option 2. Both options address effectiveness criteria 2 quite well. However, Option 2 scores higher in effectiveness criteria 1 and 3.

---

[42] More detailed multi-criteria analysis could be found in the Annex A.

B.PREFERRED OPTION

Ranking

According to our analysis, the two options can be ranked as follows:

1. Option 2: Government adopts and develops the NARMA model and starts to implement it in 2016 (Alternative Scenario).

2. Option 1: Government does not introduce NARMA but continues with the current pilot (Baseline Scenario).

Considering the evaluation criteria employed, Option 2 is slightly superior to Option 1. However, the final choice depends on the priorities of the government. If small farmers and government cost saving are the priorities, then Option 2 is superior. However, if the main priorities are to ensure high benefits for large farmers and insurance companies, then Option 1 might be considered superior to Option 2.

Motivation

Option 1 and 2 address the general objectives in the following way:

- **General objective 1: Development of an agricultural insurance market in Georgia.** As a center with extensive methodological knowledge and databases, NARMA will be more efficient in developing insurance products by crops and regions with more accurate premium rates. Those products will better reflect farms' exposure to risks and might be more affordable for farmers. One of the important functions of NARMA will be the improvement of the technical capacity of loss adjusters and other stakeholders (people responsible for product development and delivery). This will imply the accumulation of positive experiences and will build trust across all stakeholders. Penetration in terms of land is higher in Option 2.

- **General objective 2: Supporting agricultural production and increasing the competitiveness of farmers and agro business.** Since expected incomes are higher on insured land, farmers might become incentivized to cultivate unused agricultural lands. Therefore, larger areas under insurance will contribute to the increased value of agricultural production. Since Option 2 results in a higher amount of insured land, it has a higher impact on achieving this objective. In addition, the money saved as a result of the reduced production risks might be invested in improved production technology. Though the amount of savings and actual investment decisions will depend on several factors, the estimated total indemnification of farmers (which is higher in Option 1) might hint at a possible contribution of the option to achieving the objective. Moreover, using land as collateral might contribute to the improvement of farmers' access to finance. In terms of this objective, Option 1 is overperforming in terms of penetration rates, but underperforming in terms of indemnifications.

- **General objective 3: Supporting the incomes of people involved in agricultural production and minimizing their risks.** Insurance allows farmers to transfer part of their risks to insurance companies. Savings associated with the reduction of farmers' production risk might be invested in higher value added agricultural activities (e.g.,

high-value crops or vertical integration in value chain). Since Option 2 provides a significant improvement in the quality of insurance services, Option 2 better contributes to a transparent and timely loss indemnification process. It creates a pool of professional loss adjusters, reducing the time needed for responses on crop loss claims and the respective indemnifications.

Agricultural insurance is expected the reduce income volatility of farmers. Both options will contribute to this impact. However, the amount of insured farmers is estimated to be higher in Option 2 than in Option 1, hinting at the potentially higher impact of Option 2 on smoothing farmers' income fluctuations.

There might be some constraints in resources, making it difficult to realize this reform: (i) a scarcity of financial resources (state budget, changes in the prioritized sectors of the country's economy), (ii) a scarcity of human resources (e.g., program managers, loss adjusters), and (iii) quality of resources (e.g., objectivity of loss adjusters and the dedication of sale agents), resulting in negative experiences for farmers (and other stakeholders). As Option 2 creates a dedicated institution, it might do a better job in terms of the capacity building necessary for the successful implementation of the reform. However, there is the so-called "greenfield risk" because, as a new institution, NARMA will have to be developed from scratch and it will first have to build trust among stakeholders.

NARMA is likely to achieve the desired penetration rates faster and at lower costs, compensating for the reduction in subsidies with higher quality and more intensive awareness campaigns to develop the market. However, it is important to emphasize that this should be done in a strategic way, trying to provide a stable framework and slowly adjusting subsidies downwards as demand increases.

In terms of minimizing environmental risks, a slightly better impact is expected with Option 2. NARMA, as a developer of standards, is likely to consider the environmental aspects of farming. Trained loss adjusters and sale agents might spread knowledge of environmentally friendly farming practices amongst farmers.

Option 2 might also be better in terms of the maximization of collateral benefits associated with the reform. As a dedicated institution, NARMA might ensure that program is transparent and acceptable for all categories of stakeholders. It might contribute to the development of a sustainable agricultural insurance culture in the country. It is, however, important, that insurance companies feel really empowered and not simply bound to NARMA if it has to deliver the expected benefits. At the same time, it is crucial that the government makes a credible long-term commitment to fully support the program (for at least five or ten years), and with as few budget constraints as possible if the goal is to maximize the penetration rate.

VIII. MONITORING AND EVALUATION PLAN

In this section, we suggest a rough plan to be used for the monitoring and evaluation of the agricultural insurance program in Georgia. Table 20 summarizes a variety of data that could be collected and indicators that could be employed in order to make evaluating the success (or failure) of the program easier.

Table 20. Indicators of progress towards meeting the objectives

INDICATOR	FREQUENCY OF EVALUATION	RESPONSIBILITY FOR MONITORING
Amount of insured land (ha); Share of farmers insured (%); Number of insurance policies sold.	Yearly	NARMA and GIA
Subsidy level (%); Premium rate (%).	Yearly	NARMA and GIA
Number of certified loss adjusters; Number of insurance products developed; Number of guidelines developed; Number of insurance agents trained on agricultural insurance products.	Yearly	NARMA and GIA
Change in the share of companies' profits coming from agricultural insurance (%); Average share of agro insurance in total portfolio (%).	Yearly	Insurance Companies
Collection of data about all crops and all regions in a centralized dataset. Free access to data for insurance companies and product developers and customers.	Yearly	NARMA and GIA
Increase in agricultural output on insured land (%); Increase in the average value of agricultural output on insured land (%).	Yearly	Public authority, GFA and agro businesses
Investments in fertilizers/pesticides or other inputs.	Yearly	Public authority, GFA and agro businesses
Amount of land as collateral (ha); Insured yield as support for collateral.	Yearly	Banks and MFIs
Loss ratios (%); Value of losses reimbursed (GEL); Timely loss indemnification.	Yearly	NARMA and association of insurance companies

REFERENCES

1. BFC (2015). Agricultural Insurance in Georgia: Feasibility Study. Tbilisi, Zurich.

2. Cai, J., de Janvry, A. and Sadoulet, E. (2014). A randomised evaluation of the effects of an agricultural insurance programme on rural households' behaviour: evidence from China. *3ie Impact Evaluation Report 19*. New Delhi: International Initiative for Impact Evaluation (3ie)

3. Coble, K.H. and Barnett, B.J. (2012). Why Do We Subsidize Crop Insurance? *American Journal of Agricultural Economics* 95 (2): 498-504.

4. Cole, S., Cine, X.,Tobacma, J., Tapalova, P., Tounsend, R. and Vichery, R. (2012). Barriers to household risk management: Evidence from india. IMF Working Paper 12/195. In*ternatioanl Monetary Fund* (IMF).

5. Enjolras, G., Capitanio, F., Aubert, M. and Adinolfi, F. (2014). Direct payments, crop insurance and the volatility of farm income. Some evidence in France and in Italy. *New Medit* 1: 31-40.

6. GeoStat (2015). National Statistics Office of Georgia, www.geostat.ge

7. Giné, X., Townsend, R, Vickery, J. (2008). Patterns of Rainfall Insurance Participation in Rural India. *World Bank Economic Review*. Washington DC: The World Bank.

8. GoG (2014). Government decree on measures to be implemented for agricultural insurance. Decree   1462. Government of Georgia (GoG), Tbilisi, August 19, 2014.

9. GoG (2015). Government decree on the approval of agricultural insurance program. Decree   306. Government of Georgia (GoG), Tbilisi, February 19, 2015.

10. Ifft, J., Shang, W. and Todd, K. (2014). The Impact of Pasture Insurance on Farmland Values. *Agricultural and Resource Economics Review* 43(3): 390-405.

11. Katchova, A. L. (2005). The farm diversification discount. A*merican Journal of Agricultural Economics* 87: 984-994.

12. Mahul, O. and Stutly C. (2010). Government Support to Agricultural Insurance: Challenges and Options for Developing Countries. Washington DC: The World Bank.

13. O'Donoghue, E. J. (2014). The Effects of Premium Subsidies on Demand for Crop Insurance. United States Department of Agriculture (USDA).

14. O'Donoghue, E.J., Roberts, M.J. and Key, N. (2009). Did the Federal Crop Insurance Reform Act Alter Farm Enterprise Diversification? *Journal of Agricultural Economics* 60 (1): 80-104.

15. Pecuniary Social Assistance (SubsistenceAllowance)- See more at: http://ssa.gov.ge/

16. Remote sensing-based Information and Insurance for Crops in Emerging Economies - See more at: http://www.riice.org/about-riice/#sthash.74hQ0Sf4.dpuf

17. Sumner, D.A. and Zulauf, C. (2012). Economic and Environmental Effects of Agricultural Insurance Programs. *The Conservation Crossroads in Agriculture. Insight from Leading*

Economists. The Council on Food, Agricultural and Environmental Economics (C-FARE), Washington DC.

18. USDA (1999). How Farmers Can Reduce Risk: Examples Using Hedging, Forward Contracting, Crop Insurance, and Revenue Insurance. In: Managing Risk in Farming: Concepts, Research, and Analysis, pp. 65-73. *Economic Research Service*, USDA.

19. Walters, C.G. and Preston, R. (2013). Revenue Risk, Crop Insurance and Forward Contracting. *Paper prepared for presentation at the Agricultural & Applied Economics Association's 2013 Crop Insurance and the Farm Bill Symposium*, Louisville, KY, October 8-9, 2013.

20. World Bank (2014). Building Resilience to Climate Change in South Caucasus Agriculture. Ed., Ahouissoussi, N. Neumann, J. Srivastava, J. In: Direction in development. *Agriculture and rural development.* Washington DC: The World Bank.

ANNEXES

Annex A. Multi-Criteria Analysis

Table 21. Effectiveness 1 (achieving general objective 1: development of an agricultural insurance market in Georgia)

	Specific Objective	Indicator	Option 1	Option 2
a	Increased demand for agricultural insurance	1. Amount of insured land (ha)	75,756 (by 2025)	77,946 (by 2025)
		2. Share of farmers insured (%)	9.4% (by 2025)	14.85% (by 2025)
		3. Number of insurance policies sold	68,241 (by 2025)	107,743 (by 2025)
	Evaluation		**+**	**+ + +**
b	Development of affordable insurance products for farmers	1. Subsidy level (%) 2. Premium rate (%)[43]	This option considers a subsidy level of 65% for both small and large farmers. Such a high subsidy level will probably result in affordable products for farmers. Current data limitations forces insurance companies to add a high ambiguity load to the expected losses, driving up premium rates. In the course of insurance market development, data will be accumulated and more affordable products will be developed.	Developing new insurance products (based on best practices and collected data) will be one of the main functions of NARMA. As a center with methodological knowledge and extensive databases, NARMA will be more efficient in developing insurance products by crops and regions with more accurate premium rates. Those products will better reflect farms' exposure to risks and might be more affordable for farmers.
	Evaluation		**+ +**	**+ + +**
c	Improved technical capacity for loss adjustment, products development and delivery	1. Number of certified loss adjusters 2. Number of insurance products developed 3. Number of guidelines developed 4. Number of insurance agents trained on agricultural insurance products	In this option, there will not be a particular focus on improving technical capacity. However, it is expected that some experience will be accumulated and some improvements will occur.	NARMA will be in a better position to improve the technical capacity of loss adjusters and other stakeholders (people responsible for product development and delivery).
	Evaluation		**+**	**+ + +**
d	Expansion of agricultural insurance business	1. Change in the share of companies' profits coming from agricultural insurance (%);	As penetration rates become higher (9.4% in terms of insured farmers by 2025) and total collected premiums increase (37,499,366 GEL by 2025) it is expected that the	This option is associated with higher penetration rates (14.85% in terms of insured farmers by 2025) and an increase in total collected

---

[43] The model does not predict the level of subsidies or premium rates but it shows what happens to other indicators when the subsidy level and/or premiums change.

		2. Average share of agro insurance in total portfolio (%)	share of agricultural insurance in total portfolio of companies will also increase. However, this will depend on overall business growth experienced by insurance companies.	premiums (54,220,255 GEL by 2025). Therefore, in this option it is more likely that insurance companies will increase the share of agricultural insurance in their business portfolio.
	Evaluation		**+ +**	**+ + +**
e	Reduced degree of information asymmetry in the market and increased data availability	1. Collection of data about all crops and all regions in a centralized dataset 2. Free access to data for insurance companies and product developers and customers.	As time passes and the insurance market develops, more data will be accumulated, contributing to the reduction of information asymmetry in the market.	NARMA will ensure that the amount and quality of data will increase and a centralized database accessible for all stakeholders will be developed and maintained.
	Evaluation		**+ +**	**+ + +**
Overall evaluation of the criteria (Effectiveness 1)			**+ +** (8 pluses in total)	**+ + +** (15 pluses in total)

Table 22. Effectiveness 2 (achieving general objective 2: supporting agricultural production and increasing the competitiveness of farmers and agro business)

	Specific Objective	**Indicator**	**Option 1**	**Option 2**
a	Increased value of agricultural production	1. Increase in agricultural output on insured land (%) 2. Increase in the average value of agricultural output on insured land (%)	Since expected incomes are higher on insured land, farmers might become incentivized in cultivating unused agricultural land. Therefore, larger areas under insurance will contribute to an increased value of agricultural production. Under this option, the total area insured is estimated to be 75,756 ha by 2025.	A similar qualitative impact as discussed for Option 1 is expected for this option. However, Option 2 results in a slightly higher amount of insured land. The total area insured under this option is estimated to be 77,946 ha by 2025.
	Evaluation		**+**	**+**
b	Increased investments in agricultural production	1. Investments in fertilizers/pesticides or other inputs	Money saved as a result of the reduced production risks might be invested in inputs, improving the production technology of farms. Though the amount of savings and actual investment decisions will depend on several factors, the estimated total indemnification of farmers (37,499,366 GEL by 2025) might hint at the possible impact of the option for achieving the objective.	The qualitative impact expected for this option is the same as for Option 1. The estimated value of reimbursed losses in this option (29,821,140 GEL by 2025) might indicate the slightly lower potential of this option for achieving the objective.

			+	+
	Evaluation		+	+
c	Increased access to finance	1. Amount of land as collateral (ha) 2. Insured yield assupport for collateral	If agricultural land is insured, it will be easier for farmers to use it as collateral. Moreover, studies show that insurance might contribute to an increase in farmland values (see Section VI. B). Therefore, using higher valued land as collateral might contribute to the improvement of farmers' access to finance. In addition, the insured yield might be used as support for collateral (which is common practice in other countries). Total insured land (75,756 ha by 2025) might indicate a possible contribution of this option to achieving the objective.	A similar impact as discussed for Option 1 is also expected for Option 2. However, the total insured land (77,946 ha by 2025) is slightly higher in this option.
	Evaluation		+	+
Overall evaluation of the criteria (Effectiveness 2)			+ (3 pluses in total)	+ (3 pluses in total)

Table 23. Effectiveness 3 (achieving general objective 3: supporting the incomes of people involved in agricultural production and minimizing their risks)

	Specific Objective	**Indicator**	**Option 1**	**Option 2**
a	Reducing farmers' financial vulnerability	1. Loss ratios (%) 2. Value of losses reimbursed (GEL) 3. Timely loss indemnification	1. After the development of the insurance market farmers might become more aware of the risks they face. This might incentivize them to use other risk-mitigation tools as complements to insurance. This would potentially reduce the volatility of loss ratios across the years. 2. Insurance allows farmers to transfer part of their risks to insurance companies. Savings associated with a reduction of farmers' production risk might be invested in higher value added agricultural activities (e.g., high-value crops, vertical integration in value chain). This will increase farmers'	1. In addition to the impacts discussed for Option 1, well trained loss adjusters might transfer knowledge about best agricultural practices and modern risk-mitigation tools to farmers. Therefore, this option might have a slightly better impact on the reduction loss ratio volatility across the years. 2. A similar impact (as in Option 1) is expected in Option 2. However, the total value of losses reimbursed is expected to be lower in this option. It will amount to 29,821,140 GEL by 2025 (22,688,384 GEL for small farmers and 7,132,756 GEL for large farmers).

			Option 1	Option 2
			expected incomes, reducing their financial vulnerability. The total value of losses reimbursed is expected to be 37,499,366 GEL by 2025 (15,645,538 GEL for small farmers and 21,853,828 GEL for large farmers). 3. A developed insurance market might be better in ensuring a transparent loss indemnification process compared to ad hoc payments. The ratio of small farmers' NPV of net benefits to the number of small farmers is 54 GEL.	3. In addition to the impact discussed for Option 1, this option will create a pool of professional loss adjusters. This will reduce the time needed for responses on crop loss claims and the respective indemnifications. The ratio of small farmers' NPV of net benefits to the number of small farmers is 56 GEL.
	Evaluation		**+ +**	**+ + +**
b	Smoothing income fluctuation in agricultural areas	1. Measure of the volatility of income of farmers	Agricultural insurance is expected to contribute to the reduction of income volatility of farmers. Some studies (see Section VI. B) show that for relatively small farms insurance might reduce income volatility. However, for larger farmers income volatility might increase. As most Georgian farmers are small scale (and most probably will remain relatively small in the future) the insurance program might contribute to achieving this objective.	A similar impact (as in Option 1) is expected for this option. However, the number of insured small farmers in Option 1 is estimated to be less than in Option 2 (68,240 versus 106,389), hinting at a higher impact for Option 2 in smoothing income fluctuations in agricultural areas.
	Evaluation		**+ +**	**+ + +**
Overall evaluation of the criteria (Effectiveness 3)			**+ +** (4 pluses in total)	**+ + +** (6 pluses in total)

Table 24: Other Criteria

Criteria	Option 1	Option 2
NPV	**-89,341,237 GEL**	**-65,504,792 GEL**
Feasibility / Ease of compliance	There might be some constraints in resources, making it difficult to realize this reform: (1) a scarcity of financial resources (state budget, changes in the prioritized sectors of the country's economy). (2) a scarcity of human resources (e.g., program managers, loss adjusters)	NARMA, as a dedicated institution, might do a better job in terms of the capacity building necessary for the successful implementation of the reform. In addition, since NARMA is a new institution that will be developed almost from scratch, there is a so-called

	(3) quality of resources (e.g., the objectivity of loss adjusters and dedication of sale agents), resulting in negative experiences for farmers (and other stakeholders).	"greenfield risk". NARMA will have to build trust among all stakeholders. At least in the beginning of the program, APMA (as part of MoA) might have better leverage and trust than NARMA.
	+ +	**+ +**
Minimizations of risks associated with the reform	Negative externalities might be associated with: (1) Social aspects. A subsidized insurance program is expected to play a large role in the framework of social farm nets. However, a possible increase in farmland value as a result of insurance might involve the risk of increased income inequality. (2) Environmental aspects of agriculture. Cultivating marginal lands (e.g., using pasture land for crops) might increase the environmental risks of farming (see also Section V.B).	In terms of social risks, the same impact as in Option 1 is expected. In terms of minimizing environmental risks, a slightly better impact is expected with this option. NARMA, as a developer of standards, will most probably consider the environmental aspects of farming. Trained loss adjusters and sale agents might spread knowledge of environmentally friendly farming practices across farmers (See also Section VI. B).
	+ +	**+ + +**
Maximization of collateral benefits associated with the reform	Among other things, the positive externalities generated by the reform might be: (1) developing an agricultural insurance culture for all stakeholders; (2) improving data availability and quality; (3) accumulating methodological knowledge. As agricultural markets grow, some improvements with regard to the above listed positive externalities might occur in this option.	Gaining the acceptance and commitment of all stakeholders might be very challenging. However, as a dedicated institution NARMA might ensure that the program is transparent and acceptable for all categories of stakeholders. It might contribute to the development of a sustainable agricultural insurance culture in the country. Having a center with extensive methodological knowledge (regarding product development, loss adjustment, etc.) and comprehensive databases might contribute to a reduction of information asymmetry in the market and maximizing the benefits of the reform.
	+ +	**+ + +**

Annex B. APMA Statistics

Table 25: Regional statistics

Region	Number of Policies Sold		Total Premiums (GEL)		Insured Area (ha)	
	2014	**2015**	**2014**	**2015**	**2014**	**2015**
Adjara	8,520	864	1,647,864	160,029	249,065	28,643
Guria	6,581	212	1,404,976	2,683	2,173	108
Imereti	8	76	3,647	5,377	8	29
Kakheti	4,084	1,165	7,379,081	1,063,542	9,645	1,441
Mtskheta-Mtianeti	24	15	74,844	5,479	125	29
Racha-Lechkhumi	1		10,736		21	
Samegrelo	1,127	548	423,346	180,017	995	485
Samtkhe-Javakheti		210		222,009		245
Kvemo Kartli	207	98	531,797	49,933	1,862	103
Shida Kartli	400	251	1,027,493	310,539	1,277	386

Source: APMA

Table 26: Key Figures from Pilot 2014 and 2015

	2014	**2015**
Policies sold	20,952	3,439
Total premiums (in GEL)	12,503,782	2,023,747
Amount of subsidies (in GEL)	11,729,678	1,131,434
Average level of subsidies (%)	94	55
Insured area (in ha)	18,596	3,112

Source: APMA

Annex C. Workshop: Regulatory Impact Assessment (RIA) on the Crop Insurance Reform of Georgia (13 August 2015)

Table 27. List of Participants (Workshop 1)

	Full Name	Organization	Position
1	Tamar Chkadua	Aldagi	Director of retail sales department
2	Devi Khechinashvili	GIA	Head of GIA
3	Rezo Ormotsadze	USAID	Project Manager
4	Mariana Morgoshia	APMA	Acting Director
5	Teona Goderidze	ARDI	Director of projects development department
6	Levan Machaidze	Unison	Coordinator of agroinsurance project
7	Levan Maghradze	APMA	Manager of agroinsurance project
8	Guram Mirzashvili	ALDAGI	Director of underrating department
9	Malkhaz khazarbegishvili	Georgian Farmers' Association (GFA)	Manager of strategic development
10	Mamuka Kvaratskhelia	APMA	Deputy Director
11	David Gvenetadze	G4G	RIA/PMP Advisor
12	Ilia Gogichaishvli	G4G	Capital Markets Advisor
13	Nino Chokheli	G4G	Lead of Capacity Strengthening
14	Yan Shynkarenko	Agroinsurance International	CEO
15	Pati Mamardashvili	APRC	Head of APRC
16	Salome Gelashvili	APRC	Senior Researcher
17	Mariam Saldadze	APRC	Intern

Annex D. Workshop: Regulatory Impact Assessment (RIA) on the Crop Insurance Reform of Georgia, Presentation of final results (5 November 2015)

Table 28. List of Participants (Workshop 2)

	Full Name	Organization	Position
1	Levan Maghradze	APMA	Manager of agroinsurance project
2	Mamuka Kvaratskhelia	APMA	Deputy Director
3	Mariana Morgoshia	APMA	Acting Director
4	David Gvenetadze	G4G	RIA/PMP Advisor
5	Ilia Gogichaishvli	G4G	Capital Markets Advisor
6	Nino Chokheli	G4G	Lead of Capacity Strengthening
7	Natalia Beruashvili	G4G	Deputy Chief of Party
8	Malkhaz Khazarbegishvili	Georgian Farmers' Association (GFA)	Manager of strategic development
9	Yan Shynkarenko	Agroinsurance International	CEO
10	Ksenia Semiokhina	IC Group	Deputy CEO
11	Michael Japaridze	ARDI	Business Development Director
12	Andro Khukhunaishvili	IRAO	Sales Director
13	Irakli Dvali	GPIH	Market Development Director
14	Tamar Chkadua	Aldagi	Director of retail sales department
15	Tazo Japaridze	IRAO	Underwriting & Reinsurance
16	Pati Mamardashvili	ISET-PI, APRC	Professor, Head of APRC at ISET-PI
17	Eric Livny	ISET	President
18	Salome Gelashvili	ISET-PI, APRC	Senior Researcher
19	Irakli Kochlamazashvili	ISET-PI, APRC	Senior Researcher
20	Maka Chitanava	ISET-PI	Senior Researcher
21	Norberto Pignatti	ISET	Professor
22	Ia Katsia	ISET-PI, APRC	Research Associate