

## Research Article

Lasha Zivzivadze\*, Tengiz Taktakishvili, Ekaterine Zviadadze, Giorgi Machavariani

# An evaluation of permanent crops: Evidence from the “Plant the Future” project, Georgia

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**Abstract:** Promoting investments in permanent crops is often considered by the government as a powerful measure to support long-term growth in agriculture. The same attitude is prevalent among agricultural policy makers in Georgia and hence, country's government and the Ministry of Environmental Protection and Agriculture of Georgia initiate and coordinate projects facilitating new investments in permanent crops. The article deals with an evaluation of an impact of “Plant the Future” project in Georgia that provides funds for the potential beneficiaries for planting permanent crops. The structure and scope of the project are discussed in the article, and the relevant data regarding the area planted, financial impact, and beneficiaries for the period from 2015 to 2019 are analysed and the impact projection is made for the period of 2020–2043. Research showed that the target indicators of the project were fully achieved. In addition, there were a high demand from farmers to participate in this project and as a result, the budget spent in 2017–2019 exceeded the planned budget. The project appears to be beneficial in terms of net present values that are positive for all discussed discount rates, meaning that the benefits of the project are greater than costs. The return on investment of the project is around 10%, which is greater than the basic discount rate (8%). Social impact also seems to be high with 1,350 beneficiaries. According to the projection, from 2015 to 2024, around 3,000 beneficiaries will benefit from this project. In the methodology, five evaluation

criteria are used, namely, relevance, effectiveness, efficiency, impact, and sustainability. Based on the evaluation, specific recommendations are given.

**Keywords:** permanent crops, agricultural investments, impact analysis, project evaluation, project efficiency

## 1 Introduction

Georgia's agriculture is dominated by small farms with less than 1 ha of agricultural land in ownership. Most of them produce just for their own subsistence. It is worth to mention that about 41% of Georgia's population live in the rural areas. One of the problems of small farms in Georgia is the modern technological knowledge and equipment. In rural areas, food production is the only way for families to survive. Because of this fact, it is extremely hard to create competitive, import-substituting and export-oriented agricultural products in the country.

To promote agricultural development and reduce rural poverty, certain steps have been taken by the government of Georgia. Since 2012, the Government of Georgia announced the agriculture as a top priority and launched several projects/programs including the project “Plant the Future.” This project started in 2015 and the key objectives are effective use of agricultural land, planting the permanent crops, import substitution, enhancing export potential, possibility of providing raw materials to processing enterprises, and as a result improving socio-economic conditions in rural areas.

Under the project, financial support for potential beneficiaries includes co-financing for purchasing the saplings of permanent plants and constructing drip-irrigation systems, i.e. 70% of the cost of purchasing the saplings is financed and 50% of the cost of purchasing drip-irrigation system is financed. In case of agricultural cooperatives, not more than 80% of the cost of purchasing the saplings is supported and not more than 60% of the cost of purchasing drip-irrigation system is supported. Furthermore, under the “Sub-component of Berry Crops Financing” fully funded (100%) support

\* **Corresponding author: Lasha Zivzivadze**, Georgian National University SEU, Management, Tbilisi 0144, Georgia, e-mail: l.zivzivadze@yahoo.com

**Tengiz Taktakishvili, Giorgi Machavariani:** Georgian National University SEU, Management, Tbilisi 0144, Georgia, e-mail: t.taktakishvili@seu.edu.ge (TT), g.machavariani@seu.edu.ge (GM)

**Ekaterine Zviadadze:** Ivane Javakhishvili Tbilisi State University, Tbilisi 0179, Georgia, e-mail: ekaterine74@yahoo.com

is provided for covering the cost of purchasing the seedlings and drip-irrigation system on agricultural land plot from 0.15 to 0.5 ha. In addition, individuals and legal entities are financed up to 50% of the cost of construction of well/pump station and up to 60% in the case of agricultural cooperatives.

According to the International Soil Classification System, the world's soils are divided into 32 groups (IUSS Working Group WRB 2015), of which more than 20 are represented in Georgia (Soil Map of Georgia. Scale 1:500,000. Ed. Tengiz Urushadze, 1999), which shows the soil diversity of the country. Georgia also has favorable climate conditions, possessing 13 climate and 22 micro-climate zones. Most of the fruit gardens are harvested 4–5 weeks earlier compared to the European countries. Hence, soil and climate diversities are the competitive advantages of Georgian agricultural products. In addition, the Government of Georgia gives incentives to the farmers to invest in the permanent crops via launching the supporting project “Plant the Future” and at the same time to produce high-value agricultural products, which should be highly competitive in the local and the global markets. Furthermore, the focus should be on the agricultural products in demand and the highly value markets. In 2015–2019, under the project “Plant the Future,” approximately 8,546 ha fruit gardens have been planted. In 2015–2019, the total investment of the project is estimated as 89.7 mill Georgian Lari (GEL), from which the NNLE Rural Development Agency co-financed 56.3% (50.5 mill GEL).

The main objective of the presented article is to evaluate the project “Plant the Future” initiated by the Government of Georgia. The study is the first try to evaluate the importance and results of the project “Plant the Future.” Support allocated to the permanent crops is particularly important as they have long-lasting impact and can also attract higher volume of private investments. They usually yield a higher added value per hectare than annual crops. Also, the development of opportunities for the developing permanent crops will create incentives for enlarging agricultural land owned by the farmers that in turn will accelerate the growth of agriculture.

The problem that is being solved by the existence of such project is filling the gap that is created by the lack of private investments in agriculture in Georgia. The field is not very attractive for foreign investors. Local farmers also do not have enough savings to expand their operations; and moreover, they are unattractive borrowers for banks who are reluctant to give loans to smallholders. Hence, projects such as “Plant the Future” appear to be one of the sound sources of investments in agriculture in Georgia.

Introduction is followed by literature review. The methodology and key assumptions are a separate section.

After using the five evaluation criteria in the methodology – relevance, effectiveness, efficiency, impact and sustainability – the analysis and key results are provided. Finally, the conclusions and recommendations are given.

## 2 Literature review

Mason and Ricker-Gilbert (2012) studied the determinants of subsidized inputs (maize seed and fertilizer) in Malawi and Zambia and estimated the impact of input subsidies on households' commercial purchases of inputs. In the empirical application, they took kilograms of improved seed purchased commercially as the dependent variable and pointed out kilograms of subsidized improved maize seed acquired, kilograms of subsidized fertilizer acquired, kilometres to paved road, kilometers to the main market, the real value of livestock and durable assets, landholding (ha), and age of household head as the explanatory variables. Authors concluded that targeting larger farmers may cause significant crowding out by the input subsidy programs, subsidies for improved maize seed crowd out commercial seed purchases by smallholders, and receipt of subsidized fertilizer has no economically significant effect on commercial improved maize seed demand.

Abman and Carney (2020) found that in the economy that is dominated by highly fragmented agricultural land and small-sized farmers holding small amounts of land and producing mainly for their own consumption, the input subsidies in export-oriented agriculture can increase returns to agricultural expansion. Authors concluded that in case of no limit set on the land on which the farmers can use subsidized inputs, there would be more incentives for the farmers to employ additional pieces of land into production.

Chen et al. (2020), when it comes to input subsidies, considered three types of uncertainties affecting the producer behaviour, namely, output uncertainty, cost uncertainty, and price uncertainty. The policymakers should consider these factors and production efficiency when elaborating agricultural support policies. Authors suggest that the targeting criteria for the Farm Input Subsidy Program can improve the effectiveness of the program, though at a limited scale; and certain effort is put in the process to identify efficient farmers. In addition, their findings suggest that an increase in seed subsidies can give some incentives to mono cropping, which can benefit farmers.

Ricker-Gilbert et al. (2011) stated that the duration (number of years) the head of the household has lived in a village can affect his/her decision for participation in the government support program.

Chibwana *et al.* (2012) used a two-step approach to study the impacts of the Farm Input Subsidy Program on cropland allocation. In step one, the authors treated selection into the program as endogenous and conditional on household- and village-specific factors. Using multinomial logistic regression, authors tried to predict the probability of participation in the program for maize support. They used separate probit regression for predicting the probability of participation in the tobacco support program. Explanatory variables used in both models were the same. Factors, such as age, gender, and education of the household head; the number of household residents; the size of the household's landholding; the wealth position of the household; and the number of years the household head had resided in the village were considered factors affecting the selection of the household for program participation. Results of the first step regression models showed that the most vulnerable people in the local communities were not the main recipients of an input subsidy program. Second step analysis showed that households with the head having certain level of education were allocated less land to the subsidized culture and more to other crops than households with head having no education. Education improves the understanding of farmers regarding different crops, and it might be suggesting that education increases the opportunities to earn income from other sources than agriculture. Farmer's education hence is also an important variable for our analysis.

Cuong *et al.* (2020) used the net present value (NPV) and internal rate of return (IRR) to examine the economic performance of permanent crops. As farmers analyse the short-term and economic returns of permanent crops, the results expressed by these indicators provide interesting information for policymakers and other stakeholders.

Skreli *et al.* (2015) applied a propensity score matching method based on a structured survey to analyse the impact of government support program on olive and vineyard sectors (farm production capacity, technical efficiency, and use of idle land and labour) in Albania. With a propensity score matching method, authors created two similar groups, namely, subsidized farmers (treated group) and non-subsidized farmers (control group). They found that subsidy had no impact on farm size. It also did not have a statistically significant impact on crop yield per hectare, but it has had a positive impact on the area planted with olives and vineyards.

Gardner *et al.* (2013) provided guidance for assessing policy relevance that should consider solving problematic issues in society, clearly defined end users and the ways to engage them, knowledge transfer and data sharing, and added value including risk reduction.

Galati *et al.* (2015) presented a conceptual model of public spending efficiency that can be helpful for policy-makers while deciding on incentive allocation. They showed that the maximum payment is not always related to the maximum ecosystem benefit because the maximum payment may reduce incentive efficiency.

Several authors (e.g. Burch 2007) suggest that the existence of space where useful and necessary information about agricultural production processes will be available and accessible for the local community will be supportive for the farmers.

Norman (2011) considered potential deterioration in project quality, regularity of visits, access to project implementation areas, inaccuracy of project data and reporting, and technical oversight of project implementation as the main areas in project monitoring.

Galati *et al.* (2016) studied the efficiency of the PES scheme adopted in Sicily. They compared the criterion adopted (egalitarian criterion) with the actual provision criterion. They found that the payment scheme adopted provided an equal premium per hectare for land users independently of the ecosystem services provided in terms of soil C sequestered. Their results showed an unequal distribution of agri-environmental payments, which can be mitigated by actual provision.

### 3 Methodology and key assumptions

The data were taken from the NNLE Rural Development Agency, which is under the Ministry of Environmental Protection and Agriculture of Georgia. This is the time series data that cover the period from 2015 to 2019. From 2020 to 2043, it is the projection of the variables.

Under the project, 24 agricultural species are planted, namely, cherry, cherry plum, peach, sweet cherry, pomegranate, apricot, apple, olive, hazelnut, walnut, quince, blueberry, blackberry, pear, almond, raspberry, vine, table grapes, sour plum, pistachio, feijoa, plum, cornus, and persimmon. Each of the abovementioned 24 variables were measured in the following form: planted area in hectares, production per hectare in tonnes, and values in GEL.

The local wholesale prices of each product were estimated according to the expert's judgements. Furthermore, to estimate the economic impact we used the average export prices of the product, from the Georgian National Statistics office, which are represented in US dollars.

The moving average was applied for projecting the planted area from 2020 to 2024, because based on our assumption the project will finish at the end of 2024. From 2025 to 2043, it is assumed that the planted area is constant.

In order to evaluate the project “Plant the Future,” the five evaluation criteria were selected (ILO policy guidelines for evaluation 2017), namely, relevance, effectiveness, efficiency, impact, and sustainability. The evaluation criteria and relevant questions are presented in Table 1.

Key assumptions are defined as follows:

- The project started in 2015 and it will finish at the end of 2024. So the project implementing period is assumed to be defined as 10 years;
- After planting, the life expectancy of the gardens is defined as 20 years;
- Project’s total evaluation period is defined from 2015 to 2043 (29 years);
- Project’s administration cost is estimated based on the following assumption – the cost is assumed to be 4% of the project’s annual budget;
- The annual operational cost of the gardens is estimated according to the following methodology – the cost is assumed to be 10% of the total initial investment;
- In the economic impact, assumption is that under the project, Georgia will export 70% of the production goods and the rest 30% will be consumed locally;
- In the financial analysis of the project, the depreciation and tax expenses are ignored for simplicity.

**Ethical approval:** The conducted research is not related to either human or animal use.

## 4 Analysis and results

### 4.1 Relevance

Since 2012, agriculture is the national priority of the Government of Georgia. One of the key strategic documents for the Ministry of Environmental Protection and Agriculture is the Agricultural and Rural Development Strategy for 2021–2027 and relevant action plan, which was approved in December 2019. In the strategy, the first strategic direction is defined as competitive agriculture and non-agriculture sector. The activity “Plant the Future” contributes to the strategic direction 1 – competitive agriculture and non-agriculture sector. Therefore, the project “Plant the Future” is the subpart of the national priority. In the Agricultural and Rural Development Strategy for 2021–2027 strategic direction 1 – competitive agriculture and non-agriculture sector has a tight connection with Sustainable Development Goals (SDGs) including SDG 2 – Zero Hunger and SDG 8 – Decent Work and Economic Growth.

### 4.2 Effectiveness

It is worth noting that in the annual monitoring progress reports of the Rural Development Strategy (2017–2020) and the relevant action plans, the target indicators (which were planned) of the project were fully achieved (Table 2). In addition, there were a high demand from farmers to participate in this project and, as a result, the budget spent

**Table 1:** Methodology and possible questions

	Possible questions
Relevance	The extent to which the objectives of the development intervention are consistent with country needs and global priorities? To what extent does the intervention comply with development policy? How important is the intervention to the target group?
Effectiveness	Have the objectives of the indicators been achieved? How big is the effectiveness of the project compared to the objectives planned?
Efficiency	Are the objectives achieved in a cost-efficient way? What are the cost and benefit ratio? What are the economic effects of the project?
Impact	What are the social, economic, and environmental impact of the project? What are the results of the project? How many beneficiaries have been affected?
Sustainability	Are the positive effects sustainable under the project? How should the project sustainability and the effects be assessed?

Source: ILO policy guidelines for evaluation, 2017.

**Table 2:** Plant the Future – planned and actual indicators

	2017	2018	2019
Planned indicator – planted new gardens	702 ha	1,200 ha	1,600 ha
Actual indicator – planted new gardens	1,081 ha	2,053 ha	2,169 ha
Achieved percentage	154%	171%	136%

Source: <https://www.mepa.gov.ge/En/Reports/>

in 2017–2019 exceeded the planned budget (Monitoring Reports on the Implementation of the 2017–2020 Rural Development Strategy 2018–2020 Action Plan of Georgia for 2017, 2018, 2019).

Under the project, the planted areas increased, and it stimulates the growth in production for the farmers. Based on our projection, revenues of the farmers have an increasing tendency from 2018 to 2034. From 2035, the revenues of the farmers have a decreasing tendency because of the fact that garden's life expectancy is assumed as 20 years.

Within the period of 2015–2019, profit is negative, because the initial capital investment, operational cost, and administrative cost exceed the farmers' revenues. From 2020 to 2034, the projection of the farmers' profit showed an increasing tendency. However, from 2035, the farmers' profit is expected to decrease because the garden's life expectancy is defined as 20 years (Figure 1).

According to Table 3, “Plant the Future” is one of the most demanded projects compared to the ones implemented by the NNLE Rural Development Agency. Average annual rate of unique beneficiaries of the “Plant the Future” project is 288, which is approximately 2.9 times more than the same indicator of the “Young Entrepreneur” project and about 17 times less than the “Preferential Agrocredit” project. Average annual budget execution of the

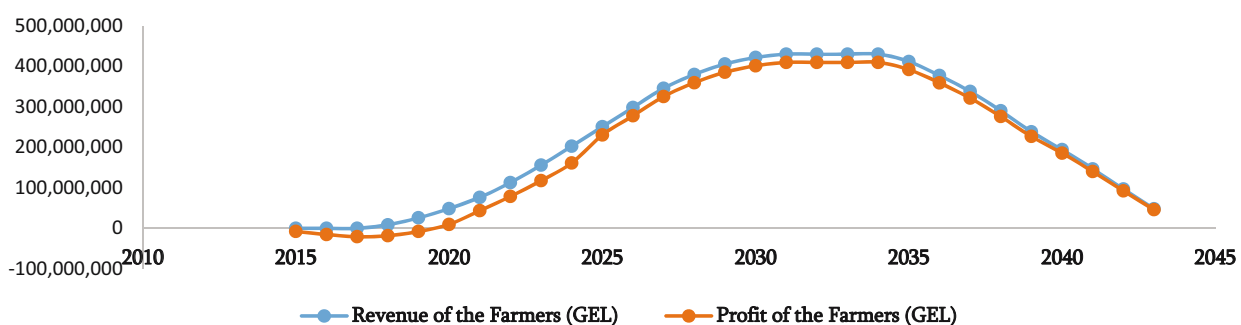
“Plant the Future” project is estimated as 9 mill GEL, which is approximately 2.6 times more than the same indicator of the “Young Entrepreneur” project and 5 times less than the “Preferential Agrocredit” project.

### 4.3 Efficiency

In order to assess the efficiency of the project “Plant the Future,” different financial criteria were estimated and interpreted. These assessment criteria were as follows: NPV, payback period (PBP), discounted PBP (DPBP), benefit–cost ratio (BCR), return on investment (ROI), and IRR. The main objective was to compare the project-related costs such as annual administrative and annual operational costs to the benefits (farmers' revenues) and, based on the results, evaluate the project's cost-efficiency.

The first financial criterion that we selected for the analysis is the NPV, as it is widely used in financial analyses. After estimating the net cash flows of the project, we calculated the NPVs for different discount rates (8, 13 and 18%). For determining the discount rate, we basically used the refinancing rate of the National Bank of Georgia as it creates the bases for the price level of money (or cost of capital) in the Georgian economy. The results are presented in Table 4. As we can see, the project is beneficial for any discount rates because the NPVs are positive for all discount rates. In other words, it means that the benefits are greater than costs. In case of the 8% discount rate, the NPV of the project is approximately 1.7 bill GEL (Table 4).

Another financial criterion that is used in this study is the PBP. The PBP is required for the initial costs to be covered by the revenues (cash inflows). The PBP for the project “Plant the Future” is 7 years. Taking into account the project's longevity (10 years) and the timing of effects



**Figure 1:** Revenue and profit of the farmers (2015–2043). Source: Authors' calculation.



**Table 3:** Key projects implemented by NNLE Rural Development Agency

Key projects implemented by NNLE RDA	Average annual budget execution (GEL)	Average annual rate of unique beneficiaries
Agroinsurance	6,675,749	12,617
Preferential Agrocredit Project	45,080,603	4,928
Plant the Future	8,957,647	288
Young Entrepreneur	3,430,191	101
Co-financing of Agro Processing and Storage Enterprises	6,852,847	14
Georgian Tea Plantation Rehabilitation Program	498,600	11

Source: NNLE Rural Development Agency.

(29 years), the outcome is acceptable. As for the DPBP, it turned out to be the same (7 years) for the 8 and 13% level of the discount rate. The DPBP is 8 years in case of the 18% discount rate (Table 4).

The BCR is considered as a relevant assessment criterion in the analysis presented in this article. The BCR is the present value of the project's future net cash inflows (revenues) to the project's present value of the net cash outflows (costs). The outcomes of the evaluation are given in Table 4. As we can see, the BCRs are more than one for all discount rates, which means that the benefits outweigh costs and therefore the project is beneficial. The BCRs are around 7, 5, and 4 for the 8, 13, and 18% discount rates, respectively (Table 4). These outcomes show that the project "Plant the Future" is financially viable and feasible because the BCRs are greater than one. For instance, for the case of the discount rate of 8%, the BCR is 7, indicating that the project's estimated benefits significantly outweigh its costs and the decision makers should expect 7 GEL in benefits for each 1 GEL of costs.

Additional financial criterion that we analysed is the ROI. The ROI is a performance measure used to evaluate the efficiency of an investment or a project. For

estimating the ROI for the project "Plant the Future," we divided the total project's returns (revenues) by the total costs. As the discounting is not applied in this method, the ROI does not depend on it. The results of the analysis are presented in Table 4. As it can be seen, the ROI of the project is around 10%. The outcome is not very high in this regard but the ROI is still greater than the basic discount rate (8%). Besides, the ROI is positive, indicating that the project is beneficial from the financial point of view.

The IRR was applied in the analysis as an assessment measure of the project's effectiveness. The IRR is the discount rate that equates the present value of the future net cash flows (revenues) received from an investment project with the project's initial cash outflow (costs). Regarding the IRR estimation, the results are shown in Table 4. The IRR for the project "Plant the Future" is approximately 50% which is significantly higher than any discount rates selected for the analysis. This indicates that the project is efficient and financially feasible. The sizable difference between the IRR and the discount rates can be partially explained by the fact that the IRR assumes the farmers will reinvest all net cash flows when they receive them.

**Table 4:** Results of the financial analysis of the project "Plant the Future"

	Discount rates		
	8%	13%	18%
Net present value (GEL)	1,697,015,847	851,279,793	451,262,394
Payback period (years)	7	7	7
Discounted payback period (years)	7	7	8
Benefit to cost ratio	7.0	5.3	4
Return on investment (%)	10.1	10.1	10.1
IRR (%)	49.9	49.9	49.9

Sources: Authors' calculations.

**Table 5:** Production, local consumption, and export by agricultural goods

	Production for 2015–2043 (tones)	Local consumption in value for 2015–2043 (USD)	Export in value for 2015–2043 (USD)	Total value for 2015–2043 (USD)
Cherry	1,078	215,617	830,126	1,045,744
Cherry plum	3,490	697,982	1,391,717	2,089,699
Peach	23,855	2,385,513	10,031,933	12,417,446
Sweet cherry	74,594	11,189,031	61,678,523	72,867,554
Pomegranate	13,724	1,372,414	7,940,183	9,312,597
Apricot	5,464	819,620	4,532,696	5,352,316
Apple	1,336,093	133,609,262	464,243,865	597,853,127
Olive	240,356	36,053,422	134,599,441	170,652,862
Hazelnut	22,807	10,263,262	105,528,038	115,791,300
Walnut	343,456	137,382,399	2,067,948,524	2,205,330,922
Quince	29,039	2,903,890	17,970,406	20,874,297
Blueberry	174,838	87,418,819	597,386,459	684,805,278
Blackberry	64,279	19,283,838	139,486,431	158,770,269
Pear	42,672	6,400,834	30,450,656	36,851,491
Almond	180,292	108,175,016	905,023,988	1,013,199,004
Raspberry	62,205	31,102,597	378,497,749	409,600,346
Vine	42,535	4,253,486	19,199,934	23,453,420
Table grape	1,663	332,637	1,230,902	1,563,540
Sour plum	83,868	8,386,752	47,013,472	55,400,224
Pistachio	22,721	27,265,083	149,820,551	177,085,634
Feijoa	4,237	423,687	1,699,830	2,123,517
Plum	181,548	27,232,221	77,982,309	105,214,530
Cornus	478	119,469	364,014	483,483
Persimmon	50,052	4,504,696	16,217,220	20,721,916
<b>Total sum</b>	<b>3,005,344</b>	<b>661,791,549</b>	<b>5,241,068,967</b>	<b>5,902,860,515</b>

Sources: Authors' calculations.

## 4.4 Impact

Social impact implies that in the period of 2015–2019, the total number of beneficiaries from the project was estimated as 1,350 (farmers). According to the projection, from 2015 to 2024, around 3,000 beneficiaries will benefit from this project.

As an economic impact in the short-run period (2015–2019), the beneficiaries totally received approximately 50.5 mill GEL as a co-finance of their investment projects from the Government of Georgia. Based on the projection, in the period of 2015–2024, the government will spend around 114.9 mill GEL from this project.

The economic impact of the project in the long-run period (2015–2043) is to increase the agricultural production of the country up to 3 mill tonnes. As a result, in the same period, the country will increase the revenues, including farmers and exporters, and the total sum in values is estimated as USD 5.9 bill (Table 5).

The project “Plant the Future” also has environmental impact, because the annual increase in planted

areas has a positive impact on the reduction of greenhouse gas emissions. Under this project, the average annual reduction in CO<sub>2</sub> emissions is estimated as 26,900 t CO<sub>2</sub> eq. (LEDS 2017). Furthermore, the planted areas support preservation and promotion of biodiversity (genetic resources).

Within the period of 2015–2019, according to the NNLE Rural Development Agency data, mostly the farmers from Kakheti, Shida Kartli, and Kvemo Kartli were using the opportunity to benefit from the project “Plant the Future.” However, in this regard, less active regions were Racha-Lechkumi, Samtkhe-Javakheti, and Adjara (Figure 2). At the same period, walnut, almonds, and apple were the permanent crops of top demand, which were planted 2,809, 1,412 and 1,018 ha areas, respectively, and they covered approximately 61% of the total planted area (Figure 3).

Within the period of 2015–2019, according to the NNLE Rural Development Agency data, of the 1,350 beneficiaries, approximately 63.4% were male and 16.4% were female participants of the project and around 18.9% were the legal entities (Limited Liability Companies or Agricultural Cooperatives) (Figure 4).

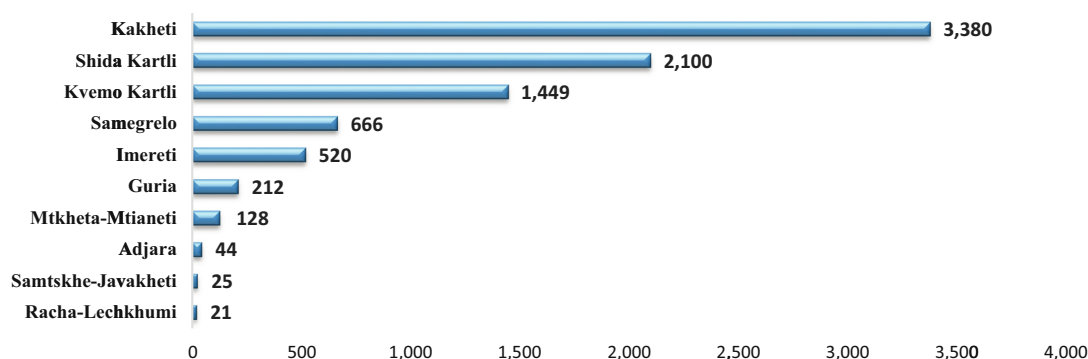


Figure 2: Planted area (ha) by regions in 2015–2019. Source: NNLE Rural Development Agency.

## 4.5 Sustainability

The Government of Georgia has created a tool to motivate and support the farmers' interest in the planting of the permanent gardens. According to the assumptions, the implementation of the project will last 10 years. When the farmers have higher returns and revenues in the future resulting from their investments, they will be more financially capable of reinvesting in agriculture and they will be more motivated to plant additional areas, which increases the probability that the project will be sustainable in the future. More income each year gives more motivation and resources to the farmers to plant additional orchards and expand their activities and scale of their businesses. Based on the projection, around 3,000 beneficiaries will benefit from the project in the future during the implementing period of 10 years, which will increase the revenues for the farmers.

As it is assumed, the project "Plant the Future" was started in 2015 and will finish at the end of 2024. During

this 10-year period, as a grant, the government will spend approximately 114.9 mill GEL, with an average of 11.49 mill GEL annually. At the end of 2024, project will finish and after this period, the government should not grant any financial resources. Furthermore, the planted gardens will give us a harvest for 20 years after the planting (based on the assumptions). As a result, from 2025, after the completion of the project "Plant the Future," the farmers will continue receiving revenues until 2043 at least due to the timing of the effects of the project. Therefore, despite the completion of the project, it will still be beneficial for the farmers. This means that the project is sustainable in the long-run period.

## 5 Conclusions

The "Plant the Future" is a relevant project for the country. It has a direct connection with the national

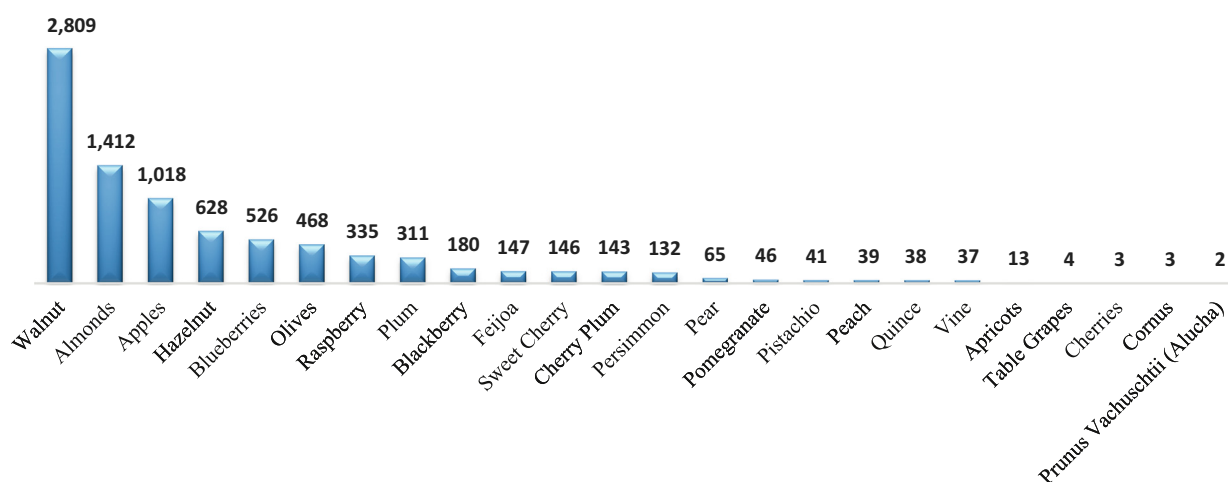
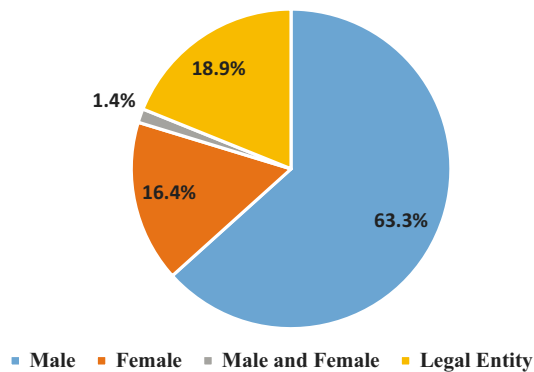


Figure 3: Planted area (ha) by agricultural product in 2015–2019. Source: NNLE Rural Development Agency.





**Figure 4:** Beneficiaries by sex in 2015–2019. Source: NNLE Rural Development Agency.

priority via the Agricultural and Rural Development Strategy for 2021–2027, and the strategy, in turn, is linked to the SDGs which are global priorities.

Based on the analysis conducted in this article, it can be understood that the project is effective. The actual annual indicators of the project were achieved more than the target indicators of the period of 2017–2019. Furthermore, from 2020 to 2034, the revenues and profit show increasing tendency. While from 2035 to 2043, the revenues and profit show decreasing tendency, because the planted gardens' life expectancy is assumed to be 20 years.

Within the period of 2015–2019, the project's social, economic, and environmental impacts were impressive, namely, (a) the number of beneficiaries was 1,350; (b) farmers received around 50.5 mill GEL as a grant; and (c) the average annual reduction of CO<sub>2</sub> emissions is estimated as 46,632 t CO<sub>2</sub> (eq.). In addition, the long-term (2015–2043) economic impact of the project "Plant the Future" is estimated as USD 5.9 bill, which is the country revenue.

As a result, under the project, the most active regions are Kakheti, Shida Kartli, and Kvemo Kartli. Top demanded permanent crops are walnut, almond, and apple. Around 63% are male, approximately 16% are female beneficiary farmers, and the rests are legal entities. Therefore, the gender issue is one of the challenges of this project.

Based on the results of the financial analysis presented in the article, it can be concluded that the project "Plant the Future" is efficient and financially viable because all financial evaluation criteria are acceptable. The project's NPV is positive and sizable and amounted to approximately 1.7 bill GEL. The BCR is 7, indicating that benefits are 7 times higher than the costs of the project. The IRR is quite high and is around 50%. It is

significantly higher than the discount rate applied in the analysis (8%). It is also important to note that according to the results of the sensitivity analysis while changing the discount rate to 13 and 18%, the project persists to be efficient as the NVPs of the project remain positive.

Project has contributed to the increase in planted areas and the production growth. In the period of 2020–2034, farmers' profit has an increasing tendency according to our projections. We calculated the NPVs for different discount rates (8, 13, and 18%) and we saw that the project is beneficial for all discount rates because the NPVs are positive for all discount rates. The PBP for the project "Plant the Future" is 7 years that is acceptable if we take into account the project's longevity (10 years) and the timing of effects (29 years). The ROI of the project is around 10% that is greater than the basic discount rate (8%).

The project is sustainable in the long-run period because after the completion of the project (2025), farmers will continue receiving revenues until 2043 and they will benefit from the project in the long-term perspectives.

The limitation of the article is the lack of previous studies/literatures in the area presented. There is very little or no prior research on the evaluation of permanent crop projects. Therefore, the limitation could be considered as a crucial opportunity to identify gaps in the prior literature and to present the need for further development in the presented area.

## 6 Recommendations

Although the project "Plant the Future" is a huge step ahead towards the development of agricultural production in Georgia and solving issues important to the rural society, still there are some areas of the project that needs to be improved, and for this sake we provide several recommendations, namely:

1. When it comes to the relevance of the project as the literature suggests, several factors should be taken into account for its analysis, including the measures taken to engage the target segment. In this regard, one incentive for attracting more people to take part in this project can be provision of the support to them for the whole production process and also at the time of harvest and sale. Although the project administration provides two days' training for the beneficiaries at the initial stage, we consider it insufficient as it is more theoretical than focussed on an actual process.

2. When we tried to analyse the relevance of the policy, we focused on studying the characteristics of the farmers involved in the project to understand what factors are affecting the decision to be involved in the project. However, we could not get data regarding the education, experience, and the size of individual farms. Making these data available will contribute to the increased precision of the future research.
3. Another recommendation regarding the relevance of the project is to promote knowledge sharing among farmers. As low qualification of the farmers can be named as one of the main problems in Georgia's agriculture, knowledge sharing between beneficiaries will be an additional value addition that the project can provide. The beneficiary networks can be established; and if the involvement of farmer in this network will be one precondition for receiving consulting support from the government, it will serve as an incentive for them to participate and share their knowledge to others, which will be beneficial for every stakeholder in the project.
4. As it was already mentioned when it comes to the effectiveness and we compare the actual results of the project to the planned ones, we can observe that actual results are even more in scale than planned while other projects (Support for Beekeeping Cooperatives, Introduction of International Standards in Cooperatives, Development of infrastructure of Agricultural Cooperatives, Co-financing of Processing Enterprises, Support of Georgian Tea Production, and Agricultural Insurance Program) initiated by the Ministry find it hard to achieve the predetermined targets. Furthermore, the "Plant the Future" is one of the most demanded projects compared to the others implemented by the NNLE Rural Development Agency. Because of this fact and considering the huge impact that the project "Plant the Future" has on the rural society, one recommendation to the relevant body will be to reallocate resources from other projects towards "Plant the Future" to increase its budget and impact on the actual social and economic issues.
5. Another recommendation we find useful to be considered by the policymakers is the monitoring phase of the project. Currently, monitoring is mainly done at the initial stage of the project, when the project administration makes relevant purchases and this phase is well documented. Nevertheless, in the following stages of the project, monitoring is not intensely applied, which raises questions whether all the inputs funded by the government are properly used or being made issues of speculation. This new approach to the monitoring stage should be elaborated, which will consider increased regularity of visits at project implementation areas, increased requirements on gathering of project data, and improved technical oversight of project.
6. There is limited attention to gender issues in the "plant the Future" project. No extra efforts or tools guarantee women engagement in this project. Therefore, under the project new tool should be established for women participation in this project. For instance, if women participate in this project, they will receive additional grants/benefits, which will ensure the gender equality challenge.
7. In addition, in order to increase the competitiveness of Georgian agricultural goods, it is crucial to support value addition by regions, municipalities, and agricultural products, including cold storages, dryers, canneries, etc. Value addition will enhance the profitability of the farmers in the rural areas.
8. The last recommendation refers to an increase in sustainability of the project in long-run period. Government should support the project beneficiaries to introduce the international quality standards in primary production, offering them relevant grant sharing program which will contribute to the increase in competitiveness of their product on international markets.

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