Public Policies Assessment to Improve the Small Agricultural Producer Profitability

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Abstract

Traditional agriculture in Peru is the main source of national food competes with imported products and mostly made by peasant producers. In recent decades, various policies have been implemented to support this type of farming, such as improving yields through new seed varieties. After trade opening in 1990, this was affected by import products, therefore was adopted mechanisms for protection and price stabilization. On the other hand, in this decade, public spending in infrastructure increased substantially vial. However, several studies show that the situation of peasants in this agriculture has improved just slightly despite the fact that for example the policy of improving varieties has been successful in increasing yield improvement.

The purpose of this research is to analyze the dynamic effects of the principal policies in support of traditional agriculture on the profit of peasant as enterprise farmers. The politics of agricultural support to be used for the study are mentioned in the previous paragraph; these are within the tariff and tax policy. The application presented here is a computer simulation which will help to measure the impact over the many political options applied and determine the better choice upgrading and protecting the peasants' profit.

1. Introduction

Traditional cultivation is based in the cultivation of different foods such as rice, rice, cotton, sugar cane, corn and potato. The used agricultural land covers an area of one million two hundred thousand hectares and provides food supply to our country. As a result, this field has the largest agricultural gross product. They are therefore one of the poorest and most vulnerable sectors of the peasantry and enterprise producers, therefore is to analyze the effects of public policies on both segments and assess their effectiveness on the most vulnerable producers, I mean if the objectives of the policy really came where they had to go.

This sector has produced some reforms which led us to large trade liberalization in the last few years. Therefore, the domestic price has been affected by the creation of the agricultural trade liberalization in our country. Concluding that the next

characteristics are related with the international market: there is a sector that is subsidized by the developed countries and international prices have a high volatility.

The application of the subsidies and aid policies by the developed countries have a big impact over the local markets not only because international markets offers low prices but also they push the local markets down to decrease their prices. Thus, the consequence of the agricultural trade liberalization is that international markets keep our local agricultural producers revenues down. Also, the variability on international food prices affects the local market leading both the consumers and agricultural producers to take sub-decisions.

The objective of the peasants' production is the selling of their agricultural products; however, this is sometimes difficult to achieve due to the agricultural producers have to cope with local mediators who impose restrictions when the agricultural producers wants to negotiate their crops. There are many factors that explain the lack of agricultural producer participation in the marketing margin, for instance, the high transportation costs, lack of information about placement products in the market, of working capital, and of collection infrastructure. These deficiencies are due to the inadequate provision of public goods [Escobal. 2000]. In addition, the wholesaler is at the same time the moneylender to the agricultural producer because they still have not access to a formal credit which makes them to negotiate with a wholesaler [Agreda, 2003]. Unlike the medium and large-scale agriculture, most peasants have no access to contractual arrangements with agroindustry and/or intermediaries that allow you to share risks and Participate more in marketing margins. In many cases, they do not receive the usual benefits available to medium and large corporations as access to credit and technical assistance.

Therefore, we can conclude that the situation described in the last two paragraphs directly affects the price given to agricultural producers and the amount they can sell. In order to quantify and decrease these negative effects, it will be discuss the transaction costs and the rural road infrastructure in the next pages.

Some studies of profitability of traditional agriculture [Gorriti, 2001] conclude that it is in crisis. Most of the agricultural producers are working at loss, but they are able to survive practicing the household economy agriculture what it means self employed. In order to improve this situation, it is required to work on the prices and agricultural yield to achieve a positive household income as well as attract capital to invest in this sector.

In this context, policies that influence the price received by producers are the tariff policy and infrastructure, in terms of yields is the policy of improvement of varieties. But to meet its goal of these policies to be implemented effectively

2. Public policies and their effects

Tariff Policy

Along with the trade liberalization, it was applied tariffs for the first time: 50% for meat, potatoes and fruit, 25% for milk, rice, sugar and oils, and 15% for corn and wheat. Additionally, it was created the System variable specific duties (SVSD) that had as objective to reduce the negative effects of the drop international prices of rice, sugar, corn, wheat and milk. Thus, the SVRD set a price limit ("floor price") for each product. In some cases, when the international price was below the price limit, it was applied the variables specific rights to fix this deviation price. In the variables specific rights definition, the term "specific" means they are set in dollars per imported item tone and are "variables" because they are based on the reference price.

This system (SVRD) was replaced in 2001 by the Peruvian System Price Band (PSPB), which is applied to the same products. Unlike the previous system, this one defines a lower and upper limit price for each product (price "floor" and price "ceiling"). It means that any international price is in a range. Therefore, applying a variable tariff which corrects the prices deviations the consumer and producer are protected from the drops and increases of the international prices.

As a result of the performance of these mechanisms mentioned above, there were periods with higher tariff protection than others as well as there were tariff reductions. Therefore, due to the instability of the often approved regulations and updated from PSPB, it is creating a lack of credibility and uncertainty in the Peruvian system about agricultural production, invest and consume decisions [Vargas, 2004].

Analysis and effects of the prices on consumer and agricultural producer

One of the objectives is to improve farm-level prices of products subject to tariff policy [Vargas, 2004]. Increasing those prices, the system of surcharges would pretend to be a mechanism to protect the value added of goods production that has been affected by the system (wheat, wheat flour, rice, yellow corn, sugar and milk).

A surcharge should raise the domestic price of good affected. However, the most effective protection translates into higher domestic prices which depend on the magnitude of the supply elasticity, the existence of substitute with surcharges and the imperfection of local markets. That is why in an environment as little competitive as it is domestic marketing of agricultural products in Peru it is likely that these rents are not transferred to the prices received by poor producers, but that would be captured by the marketing circuit.

Transport infrastructure policy and its effects

For some authors [Escobal and Valdivia, 1993] the development of rural economic infrastructure not only affects income but also the profitability of farming. In this sense, the construction and improvement of roads is seen as a way beneficial to the farmer to

the extent that its price residual (final price less transport costs) and can thus obtain a higher margin profit by reducing these costs. On the other hand, households have little ability to articulate to the markets of agricultural goods face high transaction costs [Escobal, 2005], they somehow quantify deficiencies in agricultural markets. According to these estimates, it is estimated that prices equal to 30% less than they had been in the absence these transaction costs, major costs are monitoring and r. Javier Escobal [2005] shows that from the supply function of the quantity sold would have been 13% higher if they had not been present estimated transaction costs. In this case, transports costs depend on distance to market are the most important. With this the cost of transport is important in the formation of prices of agricultural products to the point that in some cases is an impediment for producers to increase their range, which is why this paper analyzes the impacts of public policies concentrated in recent years much of the Government's efforts to correct the imperfections in rural markets through the provision of rural road infrastructure.

Spending on road infrastructure has grown steadily since the beginning of the Infrastructure Rehabilitation Program of Transportation, which began operations in 1992. You can also note that in recent years have seen very high increases (see Appendix). In the decade of 90', change in the economic infrastructure makes the rural public expenditure is increased gradually in contrast to the previous decade. In 1995 27% of the total road network providing a relatively good service and the remaining 73% does not provide service throughout the year, and when it does this is deficient [Fort, 1997]. Currently manning road that Peru is still low. The rural road network provides access to 30% of the national population and 90% of the urban centers of the country, taking much of the network is in poor condition, aggravated by the impact of topography and climate events [MINAG, 2010].

By simulating the model will have the investment policy and infrastructure of roads equally benefit both producers, i.e., which in themselves had already best benefits are way proportional, which can deteriorate the economic situation of peasants who have lower relative competitiveness. Thus the infrastructure policy can not only hampers the development of agricultural areas but also doesn't improve the incomes of peasant farmers [Saeed, 1998]. That is why as we will see these policies should not be isolated because it can widen the gap between producers if they aren't accompanied by additional policies to open other options to producers.

Technological research policy and its effects

This policy is an element of what is called productive support and it consists mainly on research to get new seed varieties in order to increase production performance. An innovation in the production management is also included in this policy which it is focused to a better water and fertilizer efficiency. The government has mainly invested in the first part of this policy (see Appendix) which shows the plot of evolution of breeding new varieties in the past two decades for rice and MAD.

The effects of this policy are presumable to be beneficial to farmers because by increasing their crop yields they will increase also their production and obtain higher profits. On the other hand, this policy may be counterproductive if it is not properly regulate the amount of hectares to plant. One example were periods where an overproduction was present which provoked a drive down farm prices and harm farmers' incomes (ESAN 2002). Since the 90's until today, the rice varieties yield has been improved by obtaining of 8.5 tons / Ha in 1995, up to 14 tons / Ha in a variety released in 2007.

3. Behavior Model

To demonstrate the efficiency of public policies that support farmers' profits (if every policy will reach effectively its target goal) we will construct a typology of farms. In order to do this we have considered: the size of the area of operation:

Exploitation type	Irrigated area in production (has)
Enterprise Farmers (formal sector, medium and large farmers)	>6
Peasants (smallholder farmer sector)	<6

This classification is mainly based on their position on the earnings of farmers. The enterprise (medium and large farmers) are aimed at maximizing profits, and the peasant farmer to the sale and consumption. In this sense we can say that it is much easier for peasants to accept restrictions for family consumption and investment.

To explain how these agricultural systems work, we use system dynamics that has used as reference the cycle's pattern of production for raw materials. This technique has been developed by Goodman (1974) as shown in Figure 1.

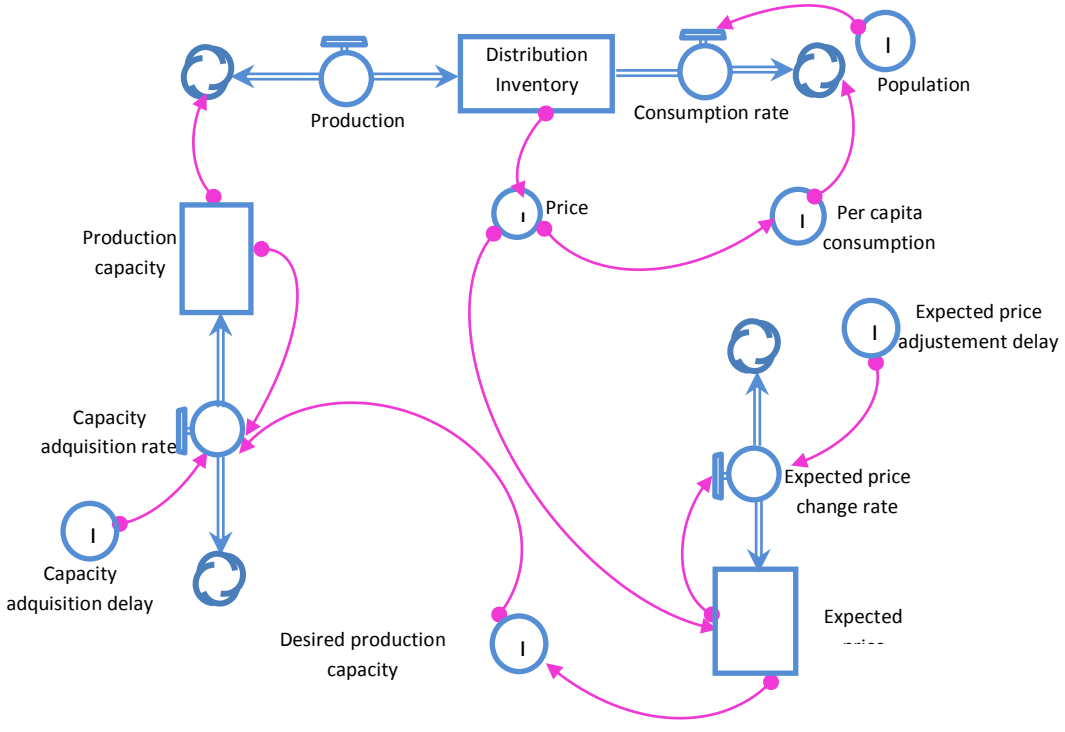

Figure 1: Cycle Pattern of production of raw materials

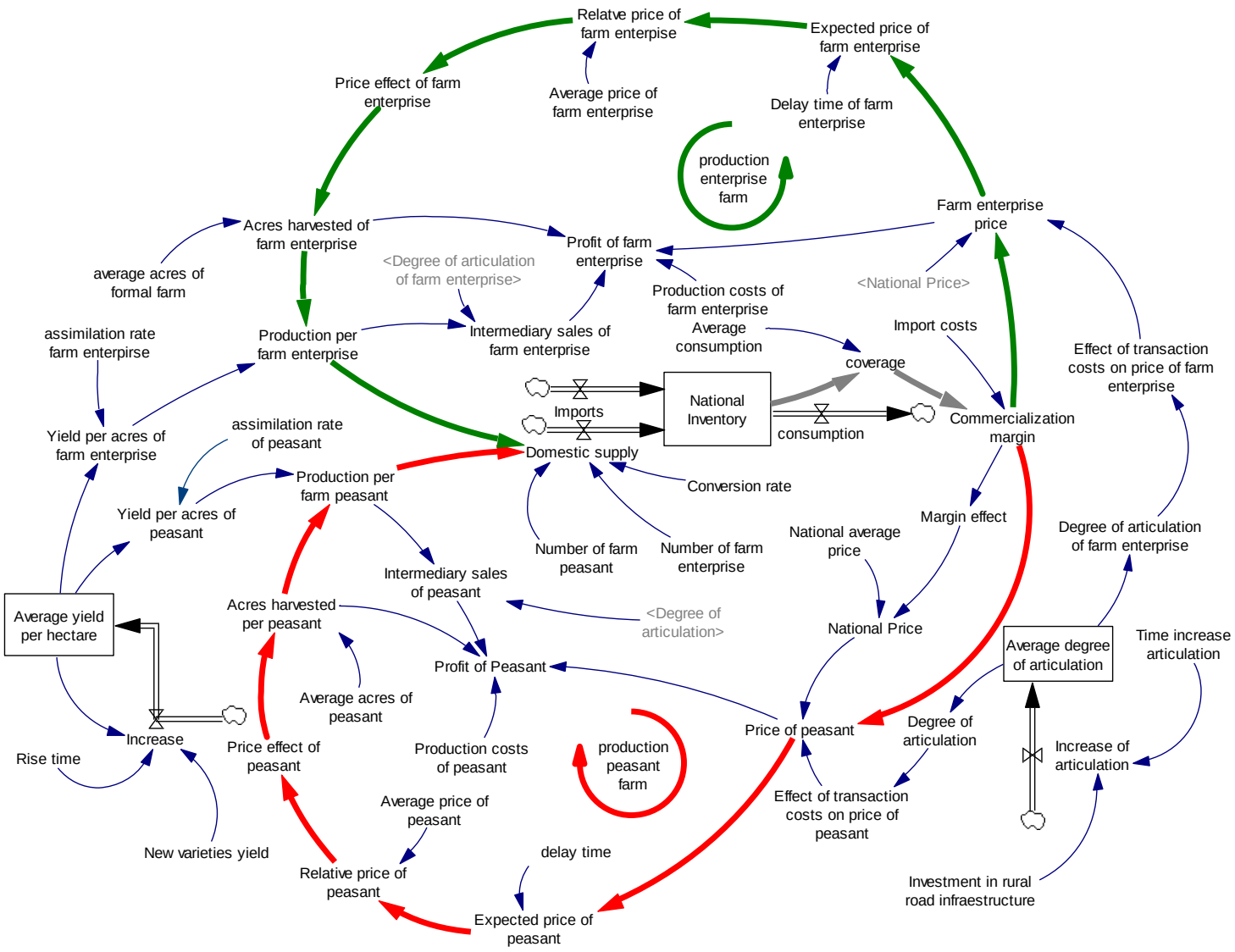

Figure 2: Stock and flow diagram

The model structure is valid for the traditional agriculture products that are importable such as rice, yellow corn, wheat and cotton. In this case we will first study for rice, and then we will continue with other products.

The model considers the dynamic behavior of prices, the impact on enterprise and peasant producers, and the consequences of policies that are made regarding the performance of new varieties of rice, investment in road infrastructure on rural roads, and import costs as well as tariff policy which results in import costs.

The model has two loops that produce domestic supply that are called Production loops of Peasant and Enterprise Farmers.

The Loop Peasant Production has generated in conjunction with the Enterprise Farmers Loop, the domestic supply. They describe the individual production of the farm and then they are multiplied by the number of farms of each type, this result is called domestic supply that is influencing through the national inventory, and the coverage (number of years that can be coverage the average consumption), and then the marketing margin. This last topic is what determines the farm price of peasant.

The expected price is the price the farmer received the previous year. In the case of peasants are taking this value reference to the expected price because they do not have efficient information systems that provide them any enterprise yield prices.

The marketing margin refers to the domestic price minus the price of the product on the farm, and is the sum of the profits from all intermediaries (gatherer, retailer, wholesaler) through nationwide, the conversion rate (68%) is the factor that converts the unpeeled rice into milled rice which, combined with rice imports, give us as a result the national inventory

The Loop Production of Enterprise Farmers has some differences from the previous loop. One example is different degrees of articulation (according to Escobal [2005] the degree of articulation is a parameter that quantifies the percentage of production intended for sale) and effects of transaction costs on prices and yields. Due to the Loop Production of Enterprise Farmers has technology, and purchasing power over improved varieties of seeds, so medium and large farmers have higher yields than peasant farmers.

Following is the description and list of variables considered important in the model:

Average yield per hectare, It is related mathematically to the yield increase and also it is related with research policies and development of new and improved rice varieties that influences the yield per hectare of rice producers.

Domestic demand (consumption) as an exogenous variable is important because it strongly influences the domestic price formation through coverage and average consumption. It must take into account that the demand dominates in the formation of prices in comparison to the supply, which has little influence over it. [Escobal, 2003]. This author also mentions that the pricing comes mostly in the cities where sales volumes are mostly of domestic origin, so the volume imported rice is a variable that has little effect and exogenously in the rice price formation

Marketing margin, It depends on coverage and imports costs; the marketing margin also determines the formation of farm and domestic price (consumer) since they intermediaries are the ones that have greater bargaining power due to the market failures that were explained in the introduction.

Average degree of coordination (ADC) is an important factor due to its influence on the investment policy in the road infrastructure and the delay degree where it reaches full operation (coordination rise time); and ADC is a determinant transaction costs that affect the price paid to peasant farmers.

Tariff policy is implicit in the costing of imports. The import cost (expressed in foreign currency) is the sum of the reference CIF price issued by the Ministry of Economy and Finance, the variable specific duties is taken from the customs tables issued by the Ministry of Economy, the applicable tariff and proper surcharge. The total import cost is calculated with the general sales tax (GST), ie, multiplying everything by a factor of 1.18. Another effect that tariff policy is in the exchange rate, the import cost in soles (1 dollar =2.87 soles) of rice due to it's constantly price change.

4. Analysis of results

The model has been evaluated over a period of twenty years from 1990 where it was given the new economic policy in Peru, which remains today. The results show that the benefits per kilo sold have slow growth but with slight decreases in certain periods. On the other hand, commercialization margin is growing faster with fewer negative changes. This shows that current policies are slowly help to grow and benefit both peasant and enterprise farmers.

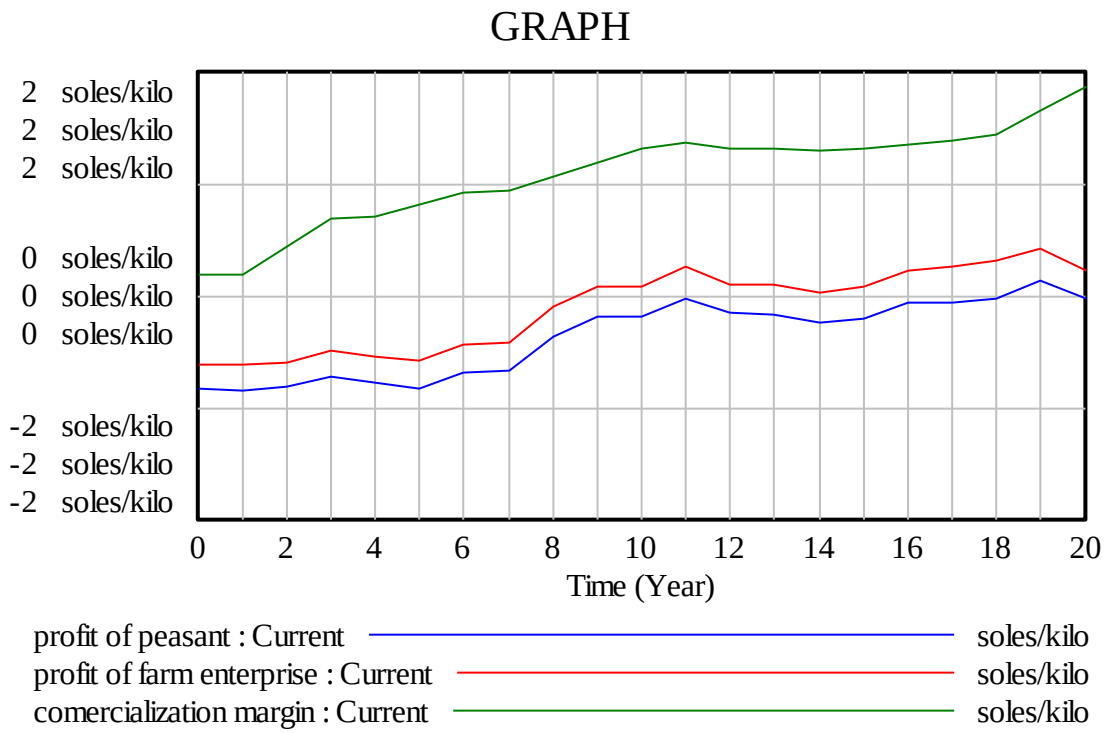

Figure 3: Evolution of the Farmers benefits and Commercialization margin

The variables that most impact the benefit of farmers is the farm price and income [Gorriti, 2003], we see in Figure 4 that both variables are in growth and variation shows that more is price, which would explain the changes in benefits for farmers. Yields are results of new varieties released by National Agricultural Research Institute over the last twenty years. The farm price is affected by the tariff policy which taxes the imported product and stabilizes international prices. You also are affected by the degree of articulation, where it has shown an increase which allowed lower costs of transactions translated into higher sales and better prices on farm.

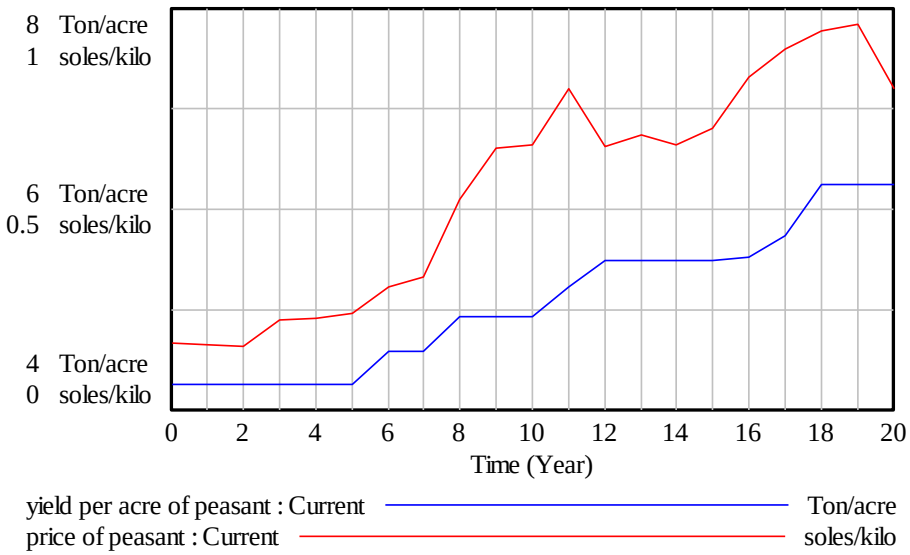

Figure 4: Evolution of Major Impact Variables

On the other hand, we observe that the last year there was a decline in farm prices by giving rise to a decrease in the benefits of farmers, this was because the national inventory has increased dramatically for two consecutive years and who recently made an impact year after the start of this growth in farm price due to late reporting. As we know, this happens when there is oversupply of property, its price low.

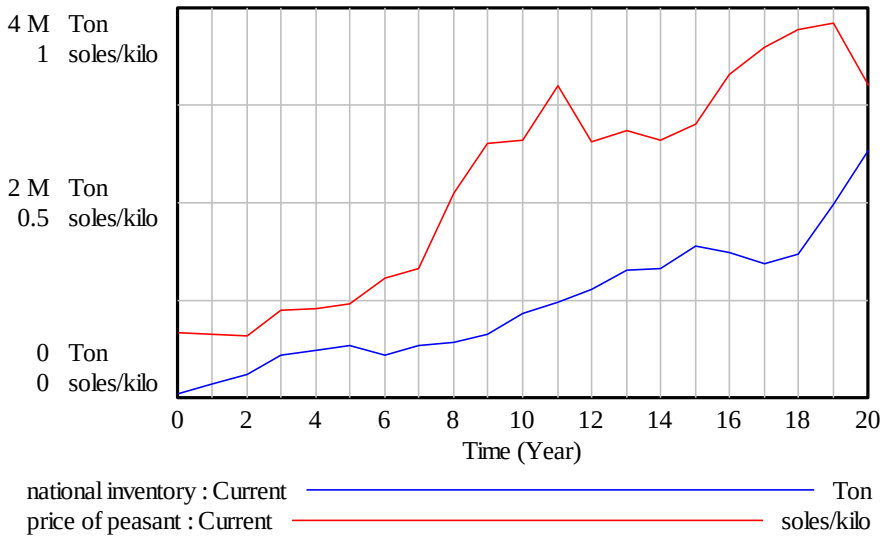

Figure 5: Evolution of the National Inventory and Price

In this section we discuss the effects of different policy scenarios of the initial model. First we analyze effects of increased investment in infrastructure and fiscal policies, improved performance individually and jointly. In this way we see the degree of impact with respect to baseline.

Then we examine the effects of tariff policy when we eliminate the surcharges and fees that make this phase a lower cost of imports, which will influence the price of this farm and the benefit to the producer. We'll see if its effects are positive or negative as it is believed to be negative and will cause the producer price falls with a corresponding drop in their profits.

Finally, we evaluated the effects of the combination of a tariff policy and tax.

Fiscal Police

Fiscal policies are related to government spending on infrastructure provision and promotion of production activities to improve farmers' income and be more competitive, those aimed at improving the level of income. These policies what they want is to have a major impact on the population, in this case in the rural population.

To increase yields per hectare and the degree of linkage of farmers, the effects of increased liberalization policies improved seed varieties and rural road infrastructure investment will be analyzed.

Scenario I

It will examine the effects of a policy of constant investment in rural road infrastructure from 2000. The policy has been carried out on an investment has been increasing over the first ten years of study at the beginning of the next four years fell but dramatically recovered.

With the use of this policy results in an increase from the year 2005 of the benefit of both types of farmers with respect to the current policy, where the increase is a bit more pronounced on peasant farmers. It also notes that the marketing margin remains unchanged.

In conclusion, a policy that should benefit peasant farmers has not done significantly. Also just in the last four years the peasants begin to make profits; this reflects an ineffective policy. Moreover, it appears that farmers are benefiting also due to a similar profit growth (reflected in the figure 6: profit of farm enterprise).

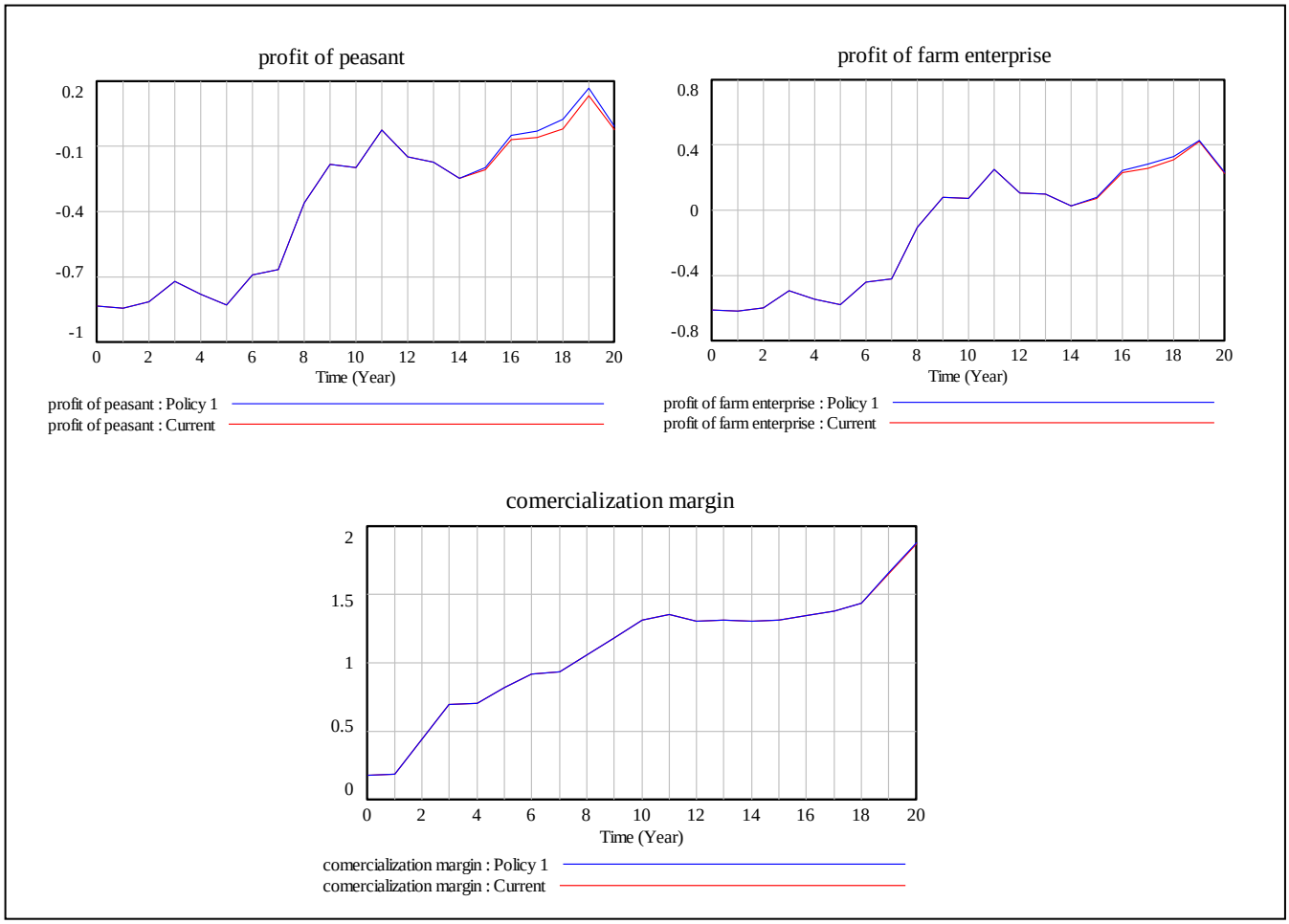

Figure 6: Scenario I

Scenario II

It will examine the effects of a policy of releasing improved seed varieties where the new yields obtained are increasing. Since, as shown in Figure 7, in 2005 he got a new lower yield compared to the year 2001, our scenario does not support new efficiencies that are less than those achieved previously.

VARIEDAD	AÑO																		
	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08
Huallaga						8.5													
Capirona								9											
INIA 501											9								
INIA 502- Pitipo												10							
INIA 503- Yacumayo												7.5							
INIA 505- Ecoarroz																7			
INIA 506- JAR I																6			
INIA 507- "La conquista"																	10		
INIA 508- Tinajones																		14.0	

Figure 7: Evolution of development of varieties of rice

With the use of this policy will achieve similar results in the three actors: farmers, enterprise farmers and intermediaries, with the difference that the growth of profits in the two types of farmers is less pronounced than the previous policy.

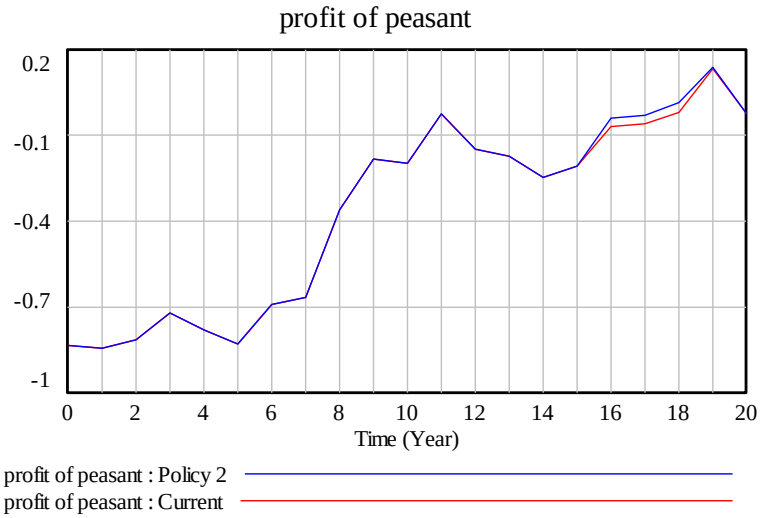

Figure 8: Scenario II

Regarding the policy of promoting a product seen in simulated scenario, we see that not very different from current scenario. Clearly shows that improved seed varieties released no significant benefits from the profits of the peasants.

Scenario III

It will examine the effects of applying the two previous policies. As expected the earnings growth is more pronounced than applying separately the two previous policies.

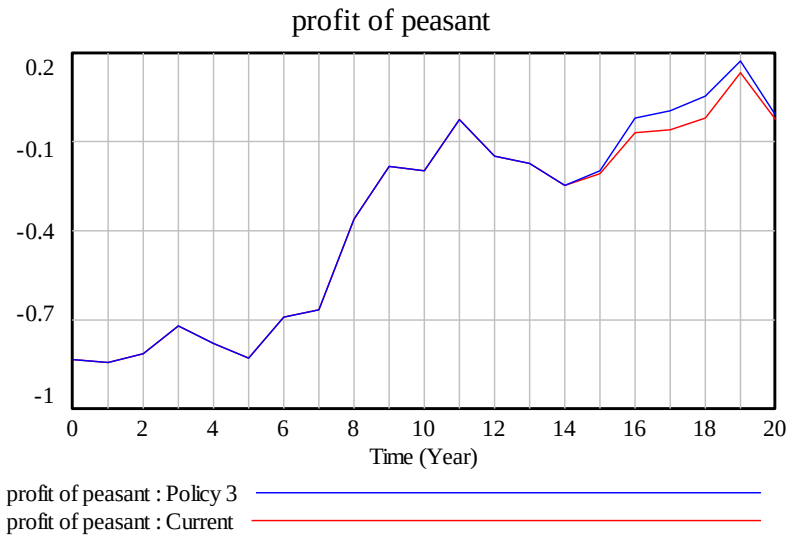

Figura 9: Escenaro III

Tariff Policy

The way the government applies the tariff policy and its development has already been described in Section 2, based on that will examine the effects of the elimination of tariffs and surcharges keeping only the DEV as price stabilization mechanism.

With the use of this policy gives variable results in the benefits of farmers, having periods when this policy produces greater benefit have the current policy. But what if it is visible to the naked eye is that the effects of this policy are not as negative as feared both because the difference of the benefits are not great.

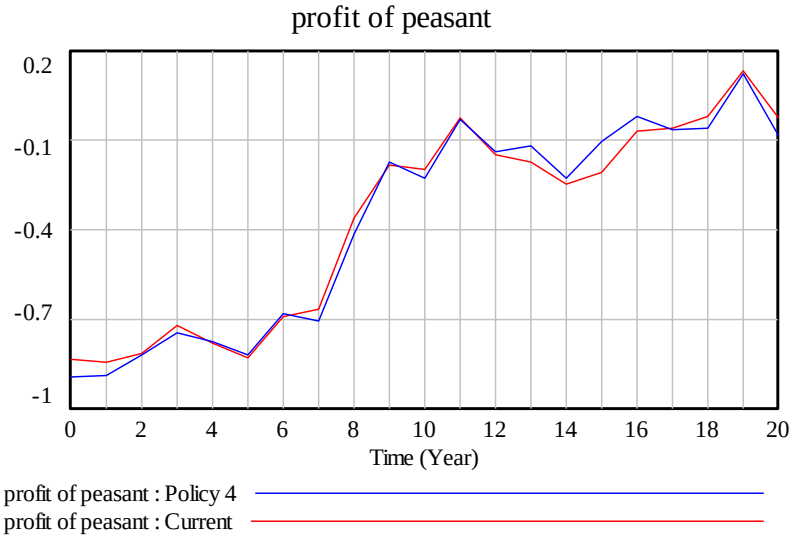

Figure 10: Impact of Tariff Policy of the Benefits of Peasants

Combined Policy

It will examine the effects of implementing the policy of the section III and tariff policy proposal. The results as well as the implementation of tariff-free policy are variable, but the periods in which this policy is better than at present, are higher. But it also notes that in the last year, the fall of the benefit of both types of farmers is more pronounced with the application of this policy. This may be due to overproduction that was built in the last two years that caused the lower farm-gate price.

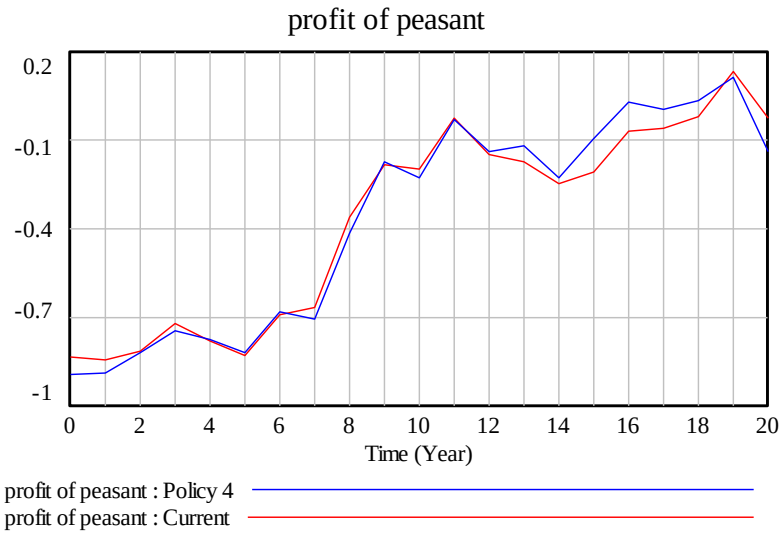

Figure 11: Profits of Peasant

5. Conclusions

The system dynamics method has been chosen to simulate the traditional agricultural sector as an integrated system. After simulating and testing the model, we can conclude that:

- The benefits of both types of farmers (peasants and enterprise) are barely differentiated with new policy measures.
- If the government due to budgetary constraints must prioritize a fiscal policy, the one that has a greater impact is the rural road infrastructure. The use of a freedom policy of improved seeds variety can lead us to overproduction which is not recommendable its use because there is a risk to make farm prices fall.
- Overproduction generates the farm price falls during a period of time so the policy of improved varieties has to be carefully applied. This only happens, whether there is a serious control on the overproduction of goods in the market. However, the application of this policy might be counterproductive if there are not adequate information systems to regulate hectares in use.

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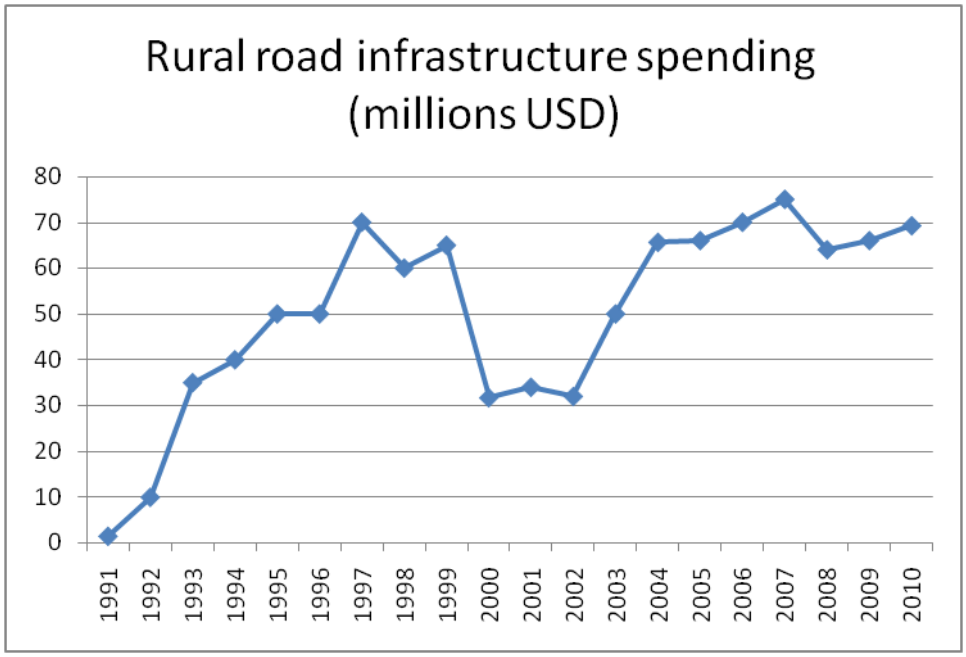
Appendix



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