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SURINAME

**Modernization of Agricultural Public Services Program**

 (SU-L1033)

Monitoring and Impact Evaluation Plan

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| **Abbreviations** |
|  |  |
| ADRON | Anne van Dijk Rice Research Organization  |
| AWD | Alternate Wetting and Drying  |
| CBA | Cost Benefit Analysis |
| CELOS | Center for Agricultural Research in Suriname |
| CPI | Consumer Price Index |
| EA | Executing Agency |
| FAO | Food and Agriculture Organization |
| FMCS | Fisheries Monitoring, Control and Surveillance system |
| FMP | Fisheries Management Plan  |
| FY | Fiscal Year |
| GDP | Gross Domestic Product |
| HDI | Human Development Index  |
| IDB | Inter-American Development Bank |
| IMIDCWG | Inter-ministerial Irrigation and Drainage Coordination Working Group |
| IICA | Inter-American Institute for Cooperation in Agriculture |
| IMF | International Monetary Fund |
| IMWGFS | Inter-Ministerial Working Group for Food Safety |
| INE | Infrastructure and Environment Sector |
| IPPC | International Plant Protection Convention (IPPC) |
| LVV | Misnistry of Agriculture and Fisheries |
| MEF | Ministry of Economy and Finance |
| MFI | Micro-finance institutions |
| NGO | Non-Governmental Organization |
| OIE |  |
| OVE | Office of Evaluation and Oversight |
| PBG | Policy Based Grant |
| TM | Metric Ton |
| USAID | US Agency for International Development |
| USDA | US Department of Agriculture |
| VPC | Office of the Vice President for Countries |
| WB | Water Board |
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# INTRODUCTION

The objective of this first operation of this Policy Based Programmatic Loan (PBP) is to contribute to the growth of the agricultural sector, through increasing agricultural productivity. The specific objectives will be to develop institutional and policy reforms to enhance farmers’ access to improved public agricultural services. In particular, the program’s objective will be achieved by improving farmers’ access to public agricultural services that include: (i) Agricultural Health and Food Services; (ii) Agricultural Innovation; (iii) Drainage and Irrigation Services and (iv) Fisheries Management Services. The operation also includes a component that aims at improving the Ministry of Agriculture’s capacity to performance de data collection and analysis.

This operation has six components: (i) Modernization of Agricultural Statistics; (ii) Modernization of the Agricultural Health and Food Safety Services; (iii) Agricultural Innovation; (iv) Modernization of drainage and Irrigation Services; and (v) Policy support for Sustainable Fisheries Management. These components aim at addressing some key policy, institutional and legal constraints that negatively affect the implementation and impact of investments in agriculture.

This document presents the monitoring and evaluation plan for this particular program. This document presents the logic of the intervention, the main indicators for outputs, outcomes and impacts, the hypotheses to be tested, the institutions responsible for each activity and the costs.

1. Logic of the Intervention

The policy changes implemented throughout the operations that compose this Policy Based Programmatic Loan (PBP) aim at increasing Sector Annual Growth by improving Productivity of the Suriname agriculture (including crop, livestock and fisheries). Most of the reforms considered focus on improving institutional performance of specific agricultural services such as animal and plant health, agricultural innovation and water management in irrigation and agricultural drainage, and fisheries management. Specifically, the policy commitments encompass regulations, norms, plans, and laws, that aim at improving coordination among actors, increase efficiency, broaden access to inputs and improve natural resources management. Through these interventions the country will reduce vulnerability to agricultural pests and diseases expand farmers’ access to improved technologies and improve water use. Furthermore, these changes will impact agricultural productivity, which will be translated into higher value added and growth of the agricultural sector. The diagram below shows the logic of the interventions considered in this Program:

**Component 2: Modernization of the Agricultural Statistics Services**

The objective of this component is to improve performance of the data collection and analysis through a series of reforms that include: (i) the publication of 2008/2009 agricultural Census by LVV, and (ii) a Draft of probabilistic methodology to collect data presented by LVV and (iii) Publication of the Estimation of the Agricultural Producer Support following OECD methodology.

**OUTCOMES**

- Improve performance of the data collection and analysis

**OUTPUTS**

-The Agricultural Census 2008/2009 published by LVV

- Draft of probabilistic methodology to collect data presented by LVV

- Estimates of support to the agricultural sector published by LVV

**Component 3: Modernization of Agricultural Health and food Safety Servicies**

The objective of this component is to increase the performance of the and food safety and animal and plant health services through the implementation of institutional reforms that include: (i) A proposal[[1]](#footnote-2) for the creation of an Inter-Ministerial Working Group for Food Safety (IMWGFS) prepared by LVV; in consensus with the Ministries of Health, Trade and Industry and Finance; (ii) the conduction of a Consultation process on the draft Animal Health Acts, including: a) Sluaghthehouse and meat Inspection, b) Animal Production, Animal Health and Animal Welfare and c) Animal Feed by LVV; and (iii) the development of a Consultations process on the draft Plant Protection Act[[2]](#footnote-3) conducted by LVV.

**OUTPUTS**

-Proposal of an Inter-Ministerial Working Group for Food Safety

- Consultation process on the draft Animal Health Acts

- Consultation process on the draft Plant Protection Act

**OUTCOMES**

- Improve performance of food safety and animal and plant health and services

**Component 4: Policy Support for Agricultural Innovation**

The objective of this component is to improve performance of the agricultural innovation services and increase farmers’ access to agricultural technology through a series of reforms that include: (i) Agricultural Innovation Strategy published; (ii) Proposal to establish the National Agricultural Innovation Board submitted to Council of Ministers.

**OUTCOMES**

- Improve performance of the agricultural innovation services

- Increase investment in agricultural research

- Increase collaboration with national and international institutions

**OUTPUTS**

-Publication of the Agricultural Innovation System Strategy

- Proposal for National Agricultural Innovation Board

**Component 5: Modernization of the Drainage and Irrigation Services**

The objective of this component is to improve the effectiveness and sustainability of the D&I Systems through a series of reforms that include: (i) the establishment of an Inter-ministerial Irrigation and Drainage Coordination Working Group (IMIDCWG)[[3]](#footnote-4); (ii) Nine existing Water Boards Executive Committees elected; and (iii) Three current WBs Executive Committees appointed by RO.

**OUTPUTS**

1. - Inter-ministerial Irrigation and Drainage Coordination Working Group (IMIDCWG)
2. Water Boards (WBs) Executive Committees elected.
3. WBs Executive Committees appointed by RO.

**OUTCOMES**

Improve the effectiveness and sustainability of the D&I Systems

**Component 6: Policy Support for Sustainable Fisheries Management**

The objective of this component is to improve the LVV’s capacity for sustainable fisheries management by implementing a series of reforms that include: (i) approval of a Fisheries Monitoring, Control and Surveillance (FMS) system; and (ii) Publication of a Fisheries Management Plan (FMP) by LVV.

**OUTCOMES**

- To improve the LVV’s capacity for sustainable fisheries management

**OUTPUTS**

- Fisheries Monitoring, Control and Surveillance (FMS) system

- Fisheries Management Plan published (FMP)

The components described above aim at increase agricultural total factor productivity and increase value added of the Suriname Agricultural sector by improving the performance of the Suriname veterinary and phytosanitary services, increasing farmer’s access to technologies, improving farmers’ access to irrigation, and improving the capacity of the Ministry of Agriculture to performance of the data collection and analysis.

**OUTCOMES**

- Improve performance of the Suriname agricultural health and food safety services

- Improve the performance of the agricultural innovation services

- Improve the effectiveness and sustainability of D&I system

- Improve the capacity of the Ministry of Agriculture to performance of the data collection and analysis

- To improve the LVV’s capacity for sustainable fisheries management

**IMPACTS**

* - -Increase Agricultural Total Factor Productivity
* Increase Sector Growth
1. Empirical Evidence

Agriculture plays a dominant role in the Suriname economy, contributing to 10% of GDP and accounting for around providing employment and income to some 17% of the economically active population. Total agricultural exports increased from USD 69 million in 2007 to USD 115 million in 2011. The total value of banana exports more than doubled from USD 16.6 million in 2007 to over USD 34 million in 2011. Together, rice and bananas are not only the major crops in terms of production, but also represented over 50% of agricultural exports. Besides rice and bananas, other important crops produced in Suriname are vegetables, plantains, citrus fruits and cassava. Together, these account for 61% of the total value of agricultural production over the 2006 – 2010 period[[4]](#footnote-5).

Nevertheless, the overall importance of the agriculture sector has been declining in the last three decades, the share of agriculture in the economy has fallen significantly from levels around 15% of GDP in the mid-1990s to below 10% today. The sectors of rice and bananas, Suriname’s most important crops, are facing challenges to improve their cost structures and remain competitive. The banana industry, which produces the second most important commodity in terms of value of production and the country’s most important agricultural export, faces strong competition from other Latin American producers as a result of changes to the EU’s preferential tariff regime. At the same time, rice producers are increasingly calling for government support to reduce the high cost of inputs that undermines their competitiveness in international rice markets[[5]](#footnote-6). Since 1990, the sector has witnessed significant variability in total production, mainly because of fluctuations in the area harvested. Total production reached a peak of 327,000 tons in 1985, before dropping to levels between 150,000-170,000 tons in the 2000 – 2004 period. Higher costs of inputs, poor infrastructure and reduced access to finance were considered as the main reasons of the decline in rice production[[6]](#footnote-7).

Some factors such as weak agricultural health and food services, poor adaptation and access to innovation, ineffective management of water resources, high transport costs or poor fisheries management remain as important obstacles to increased competitiveness and lower costs in agricultural sector and undermine the productivity of agricultural sector.

As mentioned, this program aims at increasing the value added of the agricultural sector to the overall economy by increasing agricultural productivity. For this purpose, strategic services that act as the main drivers for agricultural development have been identified. Further, specific problems and challenges associated with the institutional performance for each service have been recognized in order to be addressed through specific policy reforms.

The first service identified corresponds to the **Agricultural Health and Food Safety Services**. Suriname’s agriculture and livestock are currently free of important economic pests and diseases like banana’s black sigatoka, foot and mouth disease, and classical swine fever. However, the weakness of the national system for animal and plant health and its inability to meet increasingly important food safety standards required by international market, has resulted in high losses and reduced trade opportunities. For instance, in the case of crops, the rice blasts affect 70% of rice production producing an average loss between 10-50% of yields, which could represent an economic loss of around US$ 10 million annually (LVV Statistics Department 2012). Suriname has limited experience in dealing with outbreaks, control and eradication efforts. An outbreak of foot mouth disease in the country would lead to a contraction of the livestock sector; it is estimated potential losses of US$ 8.0 million in a 15-year time (FAO 2013). The country is not officially declared free of the major animal diseases, which is limited its potential for the export of animal products.

In the case of food safety, the Bureau of Public Health reported the number of hospitalization and mortality due to gastroenteritis has increased by 50% between 2007 and 2011, reaching almost 1,000 cases (FAO 2013). In addition, agrochemical and contamination of food supply is a concern, in particular due to pesticides and heavy metals. Between 2008- 2011, Suriname received 15 alert notifications for fruit and vegetable and fish export to the European Union because of exceeding maximum residue level (RASSF, 2012). This situation puts in jeopardy US$ 30 million of fruits and vegetables and fish annual exports.

Using their internationally recognized evaluation tools, the International Organization for Animal Health (OIE) and the Inter American Institute for Agriculture (IICA) recently assessed the performance of the Suriname veterinary and phytosanitary services delivered by the LVV (OIE, 2012 and IICA, 2012). The “performance scores” attributed were of 42% and 30% to the veterinary and phytosanitary services respectively, which appear to be among the lowest in the region. These assessments concluded that Suriname lacks modern institutional and legal framework to support a technically-sound agricultural health system that ensures the relevance, effectiveness and efficiency of its interventions and the participation of key private and non-governmental stakeholders in the decision-making process, as well as appropriate regulations to manage in accordance with international standards critical permanent services such as diagnosis, epidemiology surveillance and monitoring, risk analysis, quarantine, pest and disease control, early detection and emergency response, traceability, and the environmental management of hazardous agricultural inputs. In the case of food safety, a recent diagnostic (FAO 2013) indicates that there is: (i) lack of a legal framework and protocols to support an integrated food safety system, (ii) a fragmentation food safety programs across government departments, with minimal coordination; (iii) no clear and formal delimitation of competences among the government actors; (iv) no human resources and infrastructure plan for an integrated food safety system. In general, there is no an agricultural health and food safety system in place to improve the protection of consumers from illness and food contamination and ensure that the country’s exports meet international standards.

There is a comprehensive literature that shows that increase in international trade in products from this sector has led countries to reduce risks on natural assets and the health of their consumers, establishing regulations on health and safety measures for access to their markets. In this regard, a compilation of studies analyzing the impact of different programs of agricultural health financed by the Bank in Peru, Ecuador, Uruguay and Belize presents positive evidence of the impact that this kind of intervention has (OVE, 2009). In the case of Peru, the assessments conducted suggest that these interventions significantly reduced the prevalence of zoo sanitary diseases (for llamas) and reduced the presence of Fruit Flies. In the latter case, the improvements translated into higher prices and better yields of agricultural products (GRADE, 2008a). Furthermore, the improvement in Peru’s sanitary status improved its bargaining power with respect to other countries, creating opportunities for commercialization in international markets (GRADE, 2008b).

The second service identified corresponds to **Agricultural Innovation Services**. The challenges of this service rely on the generation and promotion of profitable agricultural practices and technologies that could potentially increase agricultural productivity among Suriname farmers. The main actors in the agricultural research and extension system are LVV: Departments of Agricultural Research, Agriculture, Livestock and Fisheries; Anne van Dijk Rice Research Organization (ADRON); Center for Agricultural Research in Suriname (CELOS); Faculty of Technical Sciences at the University of Suriname; and producer organizations.

A recent analysis of Suriname’s agricultural innovation system (Roseboom, 2013) highlights that the level of investment in agricultural research in Suriname is 1.1% of AgGDP for research (2011), which is similar to the LAC average ratio but slightly below the recommended norm of 1.5% (GFAR 2011). However, the relatively small size of the agricultural sector such as Suriname is more difficult to capture economies of scale advantages that larger countries. To offer the same level of innovation services to the sector, a small country with a very diverse agricultural sector such as Suriname will have to invest relatively more in agricultural innovation.

While there is a history of a solid plant breeding program in rice, various studies have pointed to the relative weak linkage between agricultural research and extension in the system, which affects the client orientation of the agricultural research and extension activities to achieve results. A significant proportion (40%) of Ministry of Agriculture’s research budget is allocated to ancillary laboratory services, albeit relevant for monitoring and control purposes, not destined to provide short term technological results. In addition, there is a relative fragmentation of the agricultural innovation system in Suriname, and there are limited linkages across national research entities and with international research centers. The Ministry of Agriculture has had only two agreements with international research entities in the last three years. The sector lacks of a strategy to promote an agricultural innovation system, a national innovation agenda and an institutional mechanism to foster closer interaction among the actors of the system. A recent study of World Bank (2012) on agricultural innovation noted the benefits of promoting an integrated innovation system perspective, closer linkages between research, extension and market development oriented to results, and interaction between public and private actors, both locally and internationally.

Not only the level of investment matters, but also whether the resources invested is used effectively and efficiently. Except for the rice breeding program, the Ministry of Agriculture lacks of an innovation project approach, proper planning of innovation activities, no clear results are formulated, a complete absence of any monitoring and evaluation. Multiple studies have shown the importance of proper planning, monitoring and evaluation system for improved agricultural productivity (Gijsbergs et al, 2001, and World Bank, 2008).

Moreover, there is a lack of critical mass of researchers in the system, there is none PhD, and the qualification of senior extension officers is that of mid-level technical training, in other words they do not have the formal qualifications that are required for that level. As consequence, the research and extension activities and results are very much undermined. Less than 20% of the farmers receive extension services and there are no records of recent publicly funded widespread transfer of anyone technology (LVV, 2009). In the case of infrastructure, even the government is making effort to improve the infrastructure facilities they have also deteriorated significantly. The sector lacks of a national human resource and infrastructure plan for agricultural innovation plan to identify staffing and capacity building and infrastructure among the various innovation actors. Studies examining the worldwide context of research and agricultural extension have concluded that improved human resources and infrastructure capacities foster sector’s productivity (Pardey, P. et al, 2008).

As a consequence of the above problems, Suriname shows yield gaps, vis-à-vis the region’s best performer, of 103% for rice, 108% for beef production, 88% for milk, 128% for fresh vegetables and 119% for oranges (2011). There is a need to formulate an agricultural innovation system strategy to lay out the pathway to improve the performance of the agricultural innovation system.

Studies conducted to investigate the effectiveness of agricultural innovation projects, particularly on the development of improved technologies, confirm the importance of agricultural research on production. Heisey (2001) affirms that investment in agriculture is one of the main drivers of agricultural productivity over the last fourty years. Also, Evenson and Gollin (2003) present a study that compiles the impacts of international crop genetic improvement research in developing countries from 1960 to 2000. The authors conclude that improved varieties have generated substantial increases in agricultural production and benefited consumers from a decline in food prices. Moreover, analysis conducted in this topic also concludes that strengthening agricultural research constitutes one of the most important lasting solutions to increase input demand (Morris, et. al, 2007)[[7]](#footnote-8), promote agricultural growth and poverty reduction (Fan, 2008). For the case of the LAC region, empirical evidence suggests that investments in agricultural research enhances economic growth, improves agricultural development and reduces poverty (IAASTD,2009; BID, 2010). Specific evidence on the importance of agricultural research has also been identified for specific countries. For instance, in the case of China, Fan and Pardey(1997) attributed about 20% of agricultural growth from 1965 to 1993 to public investment in agricultural research.

The third service identified corresponds to the **use of water resources and irrigation infrastructure**. The main challenge associated with the management of water resources in Suriname correspond to the lack of efficiency and inadequate water management due to obsolete policy and legal framework. Surinamese irrigation and drainage status is known to require improvements to become more productive and stable.

To improve agricultural productivity, irrigation and drainage management must be modernized and rehabilitated. A reason behind the decline of the cultivated rice paddies is that available water is not sufficient to flood and drain all plots at the right time. Furthermore, since plots are poorly leveled, peak flow demands exceed 2.2 l/s/ha, whereas 1.75 is standard flow[[8]](#footnote-9). While a water table of 100 mm is normally sufficient to control weeds, in an unleveled plot this could reach 150-200 mm to reach the highest points. Other strategies to save water including recycling water, pumping from drains to a recycling reservoir, use of the Alternate Wetting and Drying (AWD) method and plots consolidation have been proposed[[9]](#footnote-10) but not implemented. Production and area harvested are significantly lower than in the 1980s where they peaked. Yields have remained quite stable.

Right now, the Government takes on most responsibilities, finances most regular operation and maintenance costs and makes all investments in irrigation systems’ rehabilitation. In general government is equivalent to US$685 per hectare of cultivated paddy (about US$ 22 mill in 2012 and 2013).

The Government must maintain and reinforce a leading and coordinating rule, but it must lead and support also the process of devolution of water management responsibilities to growers and their Water Boards (WB), with the goal of turning into self-managed and self-financed organizations. Integrated water management is essential. However, there is a lack of coordination and leadership at the top level (i.e. among the government bodies involved in water management), and very weak development of the WBs (only WB has approved by-laws). To improve irrigation and drainage systems, both bottom-up and top-down approaches will be needed. In particular, the lack of a legal status of the WBs reduces their ability to collect tariffs, protect watersheds and promote irrigation infrastructure maintenance. The current institutional framework in the watershed is resulting in inadequate water management and poor infrastructure maintenance. This operation aims at improving farmers’ access to water resources and enhancing irrigation recovery of operation and maintenance costs.

*Impact on Agricultural productivity and income*

Having a healthy and dynamic irrigated agricultural sector has been associated with improvements in rural productivity, food security and households' income. Suriname had in 2010 a Depth of food deficit (kcalories that would be needed to lift the undernourished from their status) of 89 kcal per person and day. This could be improved augmenting rice production. Specifically, large-scale public paddy-based irrigation systems is associated with highly positive effects on rural employment and food security (Faurès et al.2007).

Agricultural water management boosts total farm output. Increased output may arise from improved yields, reduced crop loss, improved cropping intensity, and increased cultivated area. Reliable access to water enhances the use of complementary inputs such as high-yielding varieties and agrochemicals, which also increases output levels (Smith 2004; Bhattarai and Narayanamoorthy 2003; Hasnip and others 2001; Hussain and Hanjra 2003, 2004; Huang and others 2006). Food and Agriculture Organization (FAO 2003) data show that the major sources of growth in crop production for all developing countries during 1961–99 were yield increase (71%), area expansion (23%), and cropping intensity (6%). Empirical evidence for a sample of 40 countries shows that for each 1% improvement in crop productivity $1 a day poverty fell by about 1% and the human development index rose by 0.1% (Irz and others 2001). There seems to be a solid link between yield growth, poverty reduction, and human development.

Irrigation contributes to agricultural growth by raising the productivity of land and labour (and complementary inputs such as improved seed and fertilizer). Benefits have linkages within the rural economy can also spread the gains more widely. Increased productivity irrigation has a multiplier effect of on the economy has been estimated at 2.5–4 (Bhattharai, Barker, and Narayanamoorthy forthcoming; Lipton, Litchfield, and Faurès 2003; Huang and others 2006).

Smith (2007) reviewed a number of studies showing the importance of these linkages at the income levels of most poor countries that were supported by empirical studies. " Estimates of agricultural growth multipliers range from about 1.3 to 2.0, i.e. a 1% increase in agricultural output gives a 0.3–1.0% increase in non-agricultural output, and the bulk—75% or more—of these effects are shown to arise through consumption linkages (Delgado & Hopkins, 1998; Hazell & Haggblade, 1990; Thirtle et al., 2001). Hazell & Haggblade (1990) report for India that an increase of Rs100 in irrigated agricultural output stimulates Rs105 worth of additional manufacturing output and Rs114 additional tertiary output, a total non-farm multiplier of 2.19. Also often cited is a multiplier for irrigation development of 1.71 for the Muda Valley in Malaysia (Haggblade et al., 1991). Areas with well-developed infrastructure and rural urban links tend to show higher multipliers (Thirtle et al., 2001)."

*Output and income stabilization*

Access to agricultural water reduces poverty and vulnerability by lowering the variance of output, employment, and income. Two factors contribute to output fluctuations: rainfall variability and the relative prices of outputs. Food grain output is sensitive to variations in rainfall (Smith 2004; Lipton, Litchfield, and Faurès 2003). Reliable access to agricultural water not only raises crop output levels, but also usually reduces variance in output across seasons and years. For instance, the entropy index of rice yield dispersion in irrigated areas in Brazil fell from 5.3 in 1975 to 2.7 in 1995, while in rainfed areas it rose from 8.0 to 13.7. Moreover, the mean difference in yield between irrigated and rainfed areas also widened (Wood, You, and Zhang 2004).

*New Focus on Policy Reforms*

As Table 3 (taken from Faurés et al 2007) shows the new focus on investment in market-based economies should be placed on: Integrated Water resources management; upgrading irrigation, drainage and rural infrastructure, and irrigation management transfer. A strong focus is also placed on capacity building, training and accountability. All these pressing needs have been found relevant in Suriname and will be addressed with IDB's policy and investment loans in Suriname (2014- )



Source: Faurès et al 2007

*Pricing schemes and Irrigation modernization*

Irrigation schemes charge farmers fees to meet the operations and maintenance (O&M) costs. IWMI, USAID and FAO agreed that attention should be paid to five items (Molle and Berkoff, 2007.). (i) rational water use should be achieved by careful control of distribution and by allocating water to broadly meet crop requirements, with fees having little or no impact on irrigation performance; (ii) the presumable efficiency gains from irrigation tariffs would most probably be realized by the control of supply or some kind or quotas; (iii) the most critical financial factor is the level of fiscal autonomy of the irrigation agency, providing an incentive for cost-effective performance; (iv) cost recovery should be contextualized to factor in irrigators' ability to pay, and O&M activities should be prioritized for cost recovery strategies; (v) subsidized users should repay some of the investments, but should not be expected to pay the extra-costs imposed by inefficient or miscalculated investments or overstaffed organizations.

Despite these caveats, it is also true that irrigation water given free of charge would also generate welfare losses, in the form of opportunity cost and externalities. In the case of Suriname, this is translated in reduced planted land, impaired cropping management, and lower water productivity (reduced 'crops' per drop).

Consider the case of Mexico. Irrigated agriculture is extremely important both in terms of irrigated acreage (more than 5.5 million hectares) and total water use. Since the passing of the Water Law in 1992 and the creation of the National Water Commission, Mexico has embarked on a massive policy reform to allocate the water management of its large water districts to the recently created users associations. This involved setting up new institutions such as basin agencies, giving WUAs managing capacity to administer both capital assets and water resources, and transferring the financial responsibility of running districts and collecting charges to the WUAs. During the devolution process, water prices increased by 45–180% and government O&M subsidies were removed. Molle and Berkoff (2007), citing other sources, claimed that O&M charges have been quite low (equivalent to 2-7% of the gross product), and that maintenance may be suboptimal in many cases. See in Annex 3, the case of Mexico (From Garrido, 1998).

There are about 3.5Mha under irrigation in Brazil, although 29Mha are estimated to be suitable for irrigation by the National Water Agency (ANA). The Irrigation Law, enacted in 1979, and its regulations provide for the cost recovery of investment and O&M costs of government-supported irrigation projects through water charges to beneficiaries.

There is an interesting case of volumetric control and two-part charging mechanism in the Chancay-Lambayeque in Peru (Vos and Vincent, 2011). The Chancay-Lambayeque irrigation system achieved high performance with on-demand delivery to some 22,000 smallholders in a command area of some 100,000ha. Full cost recovery rates, accompanied by the requirement to pay in advance, reinforced the management and ensured the control of water use and cropping operations. Rates were $0.3 per m3 (4 soles for a service module of 576m3) in 1995, and were adjusted with inflation reaching $ 0.5 per m3 in 2010. The role of the Water User Association is crucial:

Drains are well maintained by the WUA, and this is important as waterlogging and salinity are major threats to the sustainability of the system. There is a constant pressure from the rice farmers to cultivate their complete landholding with rice, and from the farmers of the adjacent “maize zone” to expand the rice growing area, as waterlogging and salinity limits growing of non-rice crops around the rice growing zone. The WUA limits this expansion because rice requires more water which would not be available in most years. However, as the volumes are controlled and not the crops quite some rice growing can be observed outside the rice zone: those farmers grow a part of their plot with rice with a water allocation for maize. (p.709)

Water delivery closely matched the planned on-demand scheduling. Several factors can explain these findings: the high degree of dependence of the water users on the canal water, the high degree of accountability of the board of the WUA towards the users, the relatively low degree of social stratification of the users, the financial autonomy of the WUA, and the good skills of the canal operators. (p.710).

In Spain, modernization of irrigation districts was performed in 1.3 million hectares, at a cost of €7 billion. A scheme to evaluate its effects is provided by López-Gunn et al (2012).



The major impacts came in the form of increased water and land productivity, both in economic and physical terms, better cropping and irrigation precision and improvements in farmers’ quality of life, through mechanization of the irrigation operations.

The rehabilitation of the WBs in Suriname will reinforce the institutional strengthening of the revitalized WBs. This will make the irrigation applications more productive and reduce the water needs. If peak flows of 2.2 l/s/ha can be lowered to the standard of 1.75, the irrigated land could be expanded by 10-15%. That, coupled with accelerated yield increases from 0.5% per year to 2%, would not only augment the benefits but also growers' capacity to pay for irrigation and drainage costs.

The fourth service identified corresponds to the **Modernization of Agricultural Statistics**. The lack of structural and relevant agricultural information reduces the decision-making, planning, programming, monitoring and evaluation capacity of the LVV. Four years after the Fifth Suriname Census of Agriculture was done, in 2009, official results remain to be released. The census collects the only social farm household and farm infrastructure data. As a result, the census has not been used as a sample frame; thus quarterly and annual collection of information[[10]](#footnote-11) is based on qualified informants and not in statistical methods, not allowing the estimation of national totals and averages within their sample error estimates. Replacement of the current method by probabilistic surveys will be a first step in setting up an Agricultural Information System (AIS).

At the same time, the Government of Suriname lacks a sufficiently clear policy regarding its monitoring capacity in order to assess how its agricultural policy instruments translate into support for producers -- and hence it contributes to set policy objectives for the Government. To strengthen the policy monitoring function of the LVV and increasing the availability of evidence for decision-making, some analysis needs to be done regularly. This will include the estimation of agricultural support to identify trends as well as tracking how policy changes affect agricultural growth and development.

Without adequate information policy measures cannot be targeted, efficient and cost effective. Statistics and data provide a key input into the information base necessary for the formation and evaluation of agricultural policy. Key requirements are that data be relevant, objective, transparent, accurate, and comparable over time and space, accessible and timely. The OECD’ Product Support Estimates (PSE) database provides an example of internationally comparable data used to track the level and composition of agricultural support in the LAC and Caribbean Countries and provides basis for analysis of effects of these policies. (OECD, 2008).

This component seeks to address the LVV weaknesses in performance data collection and analysis that alter its capacity to plan, program, monitor and evaluate taking into account reliable and timely statistical data for policy and decision making. A comprehensive institutional reform will be promoted to improve the performance of the data collection and analysis with the support of the FAO through setting up an Agricultural Innovation System (AIS), including information on agriculture, livestock and fisheries products.

Finally, other service considered in the project is **Policy Support for Sustainable Fisheries Management**.

Many of the marine resources of commercial value in Suriname, including shrimp, seabob and finfish are comprised within the highly productive North Brazil Shelf Large Marine Ecosystem (NBSLME). The NBSLME extends along north eastern South America from the Parnaíba River estuary in Brazil to the boundary with the Caribbean Sea and has a surface area of about 1.1 million km2. Its responsible use requires ecosystem considerations to fisheries management to deal with the complexities of heterogeneous fleets harvesting shared stocks of a diversity of species (Phillips *et al.*2009; Chakalall *et al.* 2002; Seijo *et al.* 2000).

The fishery sector of Suriname represented ~ 2.3 % of GDP in 2006 and employment generated in this sector, for the same year, was of 5,169 jobs (FAO, 2008). In 2011, Suriname harvested 36,225 ton of crustaceans and fish, and had an aquaculture production of 86.7 ton. A preliminary fisheries data analysis for Suriname, indicate that the gross value of fisheries output is $US36.6 million. In 2012 shrimp, seabob and fish harvest was undertaken by fleets of 239 industrial vessels, 318 coastal small-scale boats, and 902 inland and estuarine boats and canoes (Fisheries Department, 2013). Concerning trade, the value of fish exports has remained fairly constant in Suriname in the first decade of the 21th century. In 2010, export of shrimp *Penaeus spp*., seabob (*X. kroyeri*) and finfish species represented US$ 31 million, and the average for the period 2000-2010 was US$ 32 million (Fisheries Department, 2013). According to FAO (2011), Suriname does have the potential to increase its aquaculture production of shrimp and fish, but also a number of constraints that need to be overcome such limited possibilities for export due to high cost for transport and the highly competitive nature of the world market for shrimp and tilapia.

An analysis of catch volumes and catch per unit of effort for the main commercial fisheries indicates the following tendencies (Seijo, 2013). Some fisheries such as for shrimp and seabob show a reduction in CPUE suggesting issues with sustainability. In the case of shrimp, the expected stock recovery from a systematic reduction in fishing effort from 119 shrimp trawlers in 1994 to 30 in 2012 is not occurring and is likely being offset by factors that need to be further investigated. In the case of seabob, a Marine Stewardship Council (MSC) certified fishery, effort restrictions are managed through a Harvest Control Rule (HCR) (LVV, 2010). Other major fisheries such as the multi-species industrial groundfish fishery display a fairly stable CPUE. However, the CPUE trends for individual species (for example for lane snapper *Lutjanus synagris*) indicate that some species have been subject to a significant reduction in abundance. The status of the stocks of species harvested by coastal and riverine and estuarine fleets is not well known and there is no clear time series data set to estimate CPUE for the different species harvested by the artisanal fishery.

Access rights are conferred by the Department of Fisheries, through vessels specific licenses up to the maximum number of vessels specified to operate in each specific fishery as established in the Annual Decree issued by the LVV. The Annual Decree specifies exclusive spatial fishing access rights to vessel owners to harvest a list of species with pre-defined vessel capacity (tonnage and engine HP), fishing methods and gear. Concerning rights enforceability, the complexities associated with sharing shrimp and fish stocks with countries fishing in the Brazil-Guianas ecosystem call for more robust mechanisms to mitigate the presence of IUU fishing. The Department of Fisheries has been strengthening the sustainable fisheries management regime in recent years. Since 2007, industrial vessels are required to carry a Vessel Monitoring System (VMS). The Fisheries Management Plan (FMP) for Suriname in is currently being updated. There are efforts underway to establish a Coast Guard system to mitigate the above mentioned enforcement and compliance issue. In addition, an Aquaculture Development Plan is under development.

The Fisheries Department has professional and qualified but insufficient personnel for the task of researching, and monitoring, control and surveillance (FMS) of the fisheries sub-sector. Priorities for capacity building include: (i) periodic follow-up of quality of target catch and bycatch and effort data of regulated fisheries, (ii) design and establishment of a Fisheries Information System of Suriname (FISS), including selection of an appropriate database software, (iii) training for using data base software, input fishery data, and a sustainable management of the FISS to be designed, and (iv) training on models used for stock assessment using data and information available from the FISS.

The component 6: Sustainable Fisheries Management. seeks to contribute to sustainable fisheries and aquaculture management in Suriname through strengthening of capacities for sector planning, information management and analysis, administration, monitoring, surveillance and control.

The IDB has been supporting policy reforms in agriculture that aimed at improving agricultural health services, research and innovation, technology adoption, access to information, agricultural exports and institutional capacity, among others. Recent PBP operations in agriculture include Peru (PE-L1066), Suriname **(**SU0016), Mexico (ME0185), Guyana (GY0016), Ecuador and Haiti. In the case of Suriname, for instance, the first reforms implemented eliminated unnecessary and costly constraints to trade agricultural products, created incentives to export agricultural goods by lowering costs and improved the efficiency and transparency of the import control system for addressing public health, environmental and national security concerns ([IDB, PCR:2004).](http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36784209) In Guyana, the agricultural policy reforms promoted by the operation approved in 1996, reduced taxes and commissions on rice exports and promoted the development of water-user associations ([OVE, 2002](http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36784040)). The World Bank also promotes the implementation of policy reforms in the agricultural sector that include issues regarding access to irrigation, agricultural research and extension, agricultural trade and other general agricultural issues through the execution of development policy loans or DPLs (which are equivalent of PBPs for the IDB). An independent evaluation conducted by the IEG shows that 67% of the DPLs approved in the period from 1998-2008 were rated satisfactory in regards to the achievements of the reforms and accomplished the outcomes stated during the design stage which were mainly related to increases in productivity (2011).

1. **MONITORING**

This section aims at describing the process of monitoring for the project SU-L1033. As this is a Policy Based Programmatic Loan (PBP), the policy commitments, which represent the project’s outputs, must have been accomplished before disbursement. This means that the monitoring process takes place ex-ante which implies that data collection for verification of output accomplishment, the budget for monitoring those outputs, the working plan, etc, must have been agreed and executed before to loan disbursement. For this reason, in this section we will focus on describing the outputs, the output indicators and the means of verification.

1. Output Indicators

For a PBP, the Project outputs correspond to the policy commitments and the measurement or indicator to the means of verification. As mentioned, project outputs are already accomplished to disbursement, therefore, the frequency of measurement is not included. The project outputs described in this section are also found in the *Policy Matrix* and the means of verification in the *Verification Matrix*.

|  |
| --- |
| **Component II: Modernization of the Agricultural Statistics** |
| **Output** | **Means of Verification/ Indicator** | **Institution responsible for delivering this output** |
| Agricultural Census 2008/2009 published.  | Cover letter, from the Minister of Finance, attaching the hard copy/digital form of the publication on the census. | LVV |
| Draft of probabilistic methodology to collect data presented by LVV. | Cover letter, from the Minister of Finance, attaching draft document of probabilistic methodology to collect data. | LVV |
| Estimates of support to the agricultural sector have been published. | Cover letter, from the Minister of Finance, attaching the hard copy/digital form of the publication of the Producer Support Estimates 2009-2010. | LVV |
| **Component III: Policy Support for Agricultural Health and Food safety Services Modernization** |
| **Output** | **Means of Verification/ Indicator** | **Institution responsible for delivering this output** |
| A proposal[[11]](#footnote-12) for the creation of an Inter-Ministerial Working Group for Food Safety (IMWGFS) prepared by LVV; in consensus with the Ministries of Health, Trade and Industry and Finance. | Cover letter, from the Minister of Finance, attaching the proposal. | LVV |
| Consultation processes on the following draft Animal Health Acts: (1) Slaughterhouse and Meat Inspection, (2) Animal Production, Animal Health and Animal Welfare, and (3) Animal Feed, conducted by LVV. | Cover letter, from the Minister of Finance, attaching the consultation report which includes findings and recommendations of consultation process, presentations, lists of stakeholder participants, comments from participants. | LVV |
| Consultations process on the draft Plant Protection Act[[12]](#footnote-13) conducted by LVV. | Cover letter, from the Minister of Finance, attaching the consultation report which includes findings and recommendations of consultation process, presentations, lists of stakeholder participants, comments from participants. | LVV |
| **Component IV: Policy support for Agricultural Innovation Modernization** |
| **Output** | **Means of Verification/ Indicator** | **Institution responsible for delivering this output** |
| Agricultural Innovation Strategy published. | Cover letter, from the Minister of Finance, attaching a hard copy/ digital form of the publication of the Agricultural Innovation Strategy. | LVV |
| Proposal to establish the National Agricultural Innovation Board submitted to Council of Ministers. | Cover letter, from the Minister of Finance, attaching proposal to establish the National Agricultural Innovation Board and submission to Council of Ministers. | LVV |
| **Component V: Policy Support for Drainage and Irrigation Services Modernization** |
| **Output** | **Means of Verification/indicator** | **Institution responsible for delivering this output** |
| An Inter-ministerial Irrigation and Drainage Coordination Working Group (IMIDCWG) established[[13]](#footnote-14). | Cover letter, from the Minister of Finance, attaching the Memorandum of Understanding signed by the Ministers of OW, RO and LVV establishing the Irrigation and Drainage Coordination Working Group (IMIDCWG). | LVV |
| Nine existing Water Boards Executive Committees elected. | Cover letter, from the Minister of Finance, attaching the statement of the election endorsed by the District Commissioner detailing the list of elected members of the nine (9) water boards. | RO |
| Three existing WBs Executive Committees appointed | Cover letter, from the Minister of Finance, attaching the ministerial letter of appointment of the Minister of Regional Development appointing the members of the executive committees of the three (3) water boards, and the list of the appointed members of the executive committees. | RO |
| **Component VI: Policy Support for Sustainable Fisheries Management** |
| **Output** | **Means of Verification/ Indicator** | **Institution responsible for delivering this output** |
| Fisheries Monitoring, Control and Surveillance (FMS) system approved by the Council of Ministers. | Cover letter, from the Minister of Finance, attaching a copy of the decision by the Council of Ministers approving the Fisheries Monitoring, Control and Surveillance system. | LVV |
| Fisheries Management Plan (FMP) published. | Cover letter, from the Minister of Finance, attaching a hard copy/ digital form of the publication of the Fisheries Management Plan. | LVV |

1. IMPACT EVALUATION

In this section, we present the project impact evaluation plan, including the hypotheses to be tested, the result and impact indicators, the evaluation methodology to identify project’s impact, the data collection process, the work plan and the budget.

1. Impact and Result Indicators

Table 2 presents the project impacts and outcomes. Indicators, means of verification and frequency of measurement are specified for impacts and outcomes.

**Table 2: Hypotheses, Indicators and Means of Verification**

|  |  |  |  |
| --- | --- | --- | --- |
| **Hypotheses** | **Indicators**  | **Frequency of Measurement** | **Means of Verification** |
| **Impact** |
| Sector Annual Growth PBP | % annual growth of Agricultural Value of Production | 2015 | FAOSTAT 2011Compare evolution of performance over time. |
| **IntermediateIntermediary Result**  |
| The policies promoted in this PBP increase agricultural total factor productivity[[14]](#footnote-15)  | % annual Growth Total Factor Productivity | 2015 | IDB study, Technical Cooperation to replicate and expand the previous estimations. |
| The policies promoted in this PBP increase Number of farmers receiving services including: extension, veterinary services, irrigation training and rehabilitated irrigation polders. (17% women) | Number of farmers receiving services including: extension, veterinary services, irrigation training and rehabilitated irrigation polders. (17% women) | ANNUALLY | Agricultural Census and Annual Production Surveys |
| The policies promoted in this PBP increase Ratio of current Catch per unit of effort CPUE (kg/das) on historical CPUE max for the following specific species 1. Seabob (*X. kroyeri*) kg/das
2. Penaeid shrimp species (ton/trawler/year)
3. Groundfish species caught (multi-species CPUE) kg/das
4. Lane snapper (*Lutjanus synagris*) caught by bottom trawlers kg/das
5. Kandatriki (*Cynoscion virescens*) caught by bottom trawlers6) Black snapper (*Lutjanus griseus*) kg/das
6. Red snapper (*Lutjanus purpureus*) caucht by the Venezuelan fleet. kg/das
 | Ratio of current Catch per unit of effort CPUE (kg/das) for specific species | ANNUALLY | LVV Fisheries information system |
| **Component II: Modernization of the Agricultural Statistics** |
| **Results** |  |  |  |
| The policies promoted in this PBP improveperformance of the Suriname data collection and analysis services | Number of publications from data generated using probabilistic method | ANNUALLY | LVV Agricultural Statistics |
| **Component III: Policy Support for Agricultural Health and Food safety Services Modernization** |
| **Results** |  |  |  |
| The policies promoted in this PBP improvethe performance of the agricultural health and food safety services | Number of Alert Notification for Food (fish, fruits and vegetables) generated by the EU.  | ANNUALLY | E.U.'s Rapid Alert System for Food and Feed (RASFF). |
| Performance Index of the plant system as measured by IICA-PVS tool  | 2015 | IICA- National Plant Protection Organizations Performance, Vision, Strategy tool. |
| Performance Index of the animal system as measured by OIE-PVS methodology | 2015 | OIE-Performance Veterinary Service tool |
| Number of major animal diseases for which Suriname obtains OIE free status certification | 2015 | *OIE* |
| Number of major plant pests for which Suriname obtains IPPC-ISPM free status certification. | 2015 | *IPPC-ISPM* |
|  |  |  |
| **Component IV: Policy support for Agricultural Innovation Modernization** |
| **Results** |  |  |  |
| The policies promoted in this PBP improve the performance of the agricultural innovation services. | % Innovation projects that are being implemented according to scheduled time  | ANNUALLY | Report of Agricultural Innovation Projects Monitoring and Evaluation System |
| The policies promoted in this PBP increase Capacity in Agricultural Research | Number of professionals operating in agricultural innovation projects1. New
2. Trained
 | ANNUALLY | Report of Agricultural Innovation Projects Monitoring and Evaluation System |
| The policies promoted in this PBP increase in the collaborations with national and international institutions | Number of collaborations with external partners national/international research institutions  | ANNUALLY | Report of Agricultural Innovation Projects Monitoring and Evaluation System |
|  |  |  |  |
| **Component V: Policy Support for Drainage and Irrigation Services Modernization** |
| **Results** |  |  |  |
| The structural changes promoted in this PBP improve the effectiveness and sustainability of D&I systems | Number of has irrigated with improved water applications and drainage | ANNUALLY | LVV report on Irrigation and Drainage rehabilitation projects. |
| **Intermediary Result** |  |  |  |
| To improve the governance and institutions of the D&I systems | Number of WBs with approved andimplemented maintenance plans | ANNUALLY | LVV report on Irrigation and Drainage rehabilitation projects. |
| **Component VI: : Policy Support for Sustainable Fisheries Management** |  |  |  |
| **Results** |  |  |  |
| The policies promoted in this PBP improve the LVV’s capacity for sustainable fisheries management | Number of fishing licenses issued (Marine Inland) | 2013, End of the programm | Success: declining number of licensesLVV Fisheries information system |

1. Impact Evaluation Methodology: Reflexive Comparison and Ex-Post Cost Benefit Analysis

**1. IMPACT EVALUATION METHODOLOGY**

The evaluation methodology used to identify the project’s impacts will be a reflexive comparison (Component II, III, IV, V and VI).

Specifically, the reflexive methodology consists on measuring the impact and outcome indicators (*Y*) before (*t=0*) and after project implementation (*t=1*). Although this is not considered as a rigorous impact evaluation methodology, in some cases such as the PBPs, using this methodology represents a valid approach given the nature of the project. In particular, this project is composed by a series of interventions that affect agricultural services provision at the national level. Most of the outputs to be delivered represent interventions that aim at improving institutional performance including national programmatic plans, national policies, strategic plans, laws and regulations, among others. These interventions will have a national scope and therefore, most of the indicators are measured at the national level. Besides, most of the indicators are proxies to capture institutional performance which is mainly affected by policy changes at the national level such as the ones included in this project. Moreover, because of the nature of the interventions included in the project affect the national population, it is impossible to identify a counterfactual group identical to the beneficiary group in all observable and unobservable characteristics. In other words, because the beneficiary group encompasses all the Suriname population, it is not possible to identify a group of non beneficiaries in order to compare the situation with and without the project which is the main challenge of every impact evaluation.

There are three main reasons why this type of methodology can be appropriate for this type of projects. First, as mentioned, most of the interventions have a national scope. Therefore, it is impossible to identify a counterfactual group identical to the beneficiary group in all observable and unobservable characteristics as all the Surinamese will be affected by the project. Second, it is impossible to observe the country as a whole with and without the project in the same period of time. Besides, it is impossible to identify another country that might be used as a counterfactual for Suriname. Third, most of the outcome indicators of the project capture institutional performance which can only be affected by regulations and norms at the national level. For all this, the analysis of national variables before and after the Program is implemented provides an important feedback.

Specifically, this methodology implies the measurement of the indicators before and after the project:

$$Impact=Y\left(t=1\right)-Y (t=0)$$

Where,

t=1 means after program implementation

t=0 means before program implementation

Graphically:



This graph shows the main problem associated with this type of methodology. The main issue is that comparing an indicator before and after includes the impact of the project and the time tendency.

Besides collecting the indicators mentioned in the previous sections, the evaluation of this PBP will require the development of the Product Support Estimates (PSE)[[15]](#footnote-16) and related indicators. Those indicators will be constructed in order to measure the total transfers to producers and effectiveness of the policy changes, following OECD methodology.

Transfers to agricultural producers that benefit individual farmers or group of farmers must be included in the PSE. When the transfers benefit the agricultural sector as a whole, they are considered support to general services and, as a result, are included in the General Support Estimates, GSSE[[16]](#footnote-17), including public goods such as research, development, training, inspection, marketing and promotion.

The transfers to agricultural producers are included in the PSE indicator, while public expenditure that benefits the sector as a whole is used in the GSSE. Finally, support to consumers is taken into account in the calculation of the CSE[[17]](#footnote-18).

Together the three indicators PSE, GSSE and CSE compose the Total Support Estimate (TSE)[[18]](#footnote-19), i.e. the total transfers from consumers and taxpayers to agricultural producers associated with agricultural policy. The TSE can be used to indicate the total level of public sector support to agriculture in a given country.

The Market Price Support (MPS)[[19]](#footnote-20) component of the PSE is taken as the difference between the observed domestic price received by farmers, and the international reference price that represents the value of the commodity in the international market. The reference price is considered to be the price that domestic producers could have received for their products in the absence of any domestic or trade policy affecting this commodity's market. Usually, these reference prices are usually calculated on the basis of border prices of imports (Cost, Insurance and Freight - CIF) and exports (Free On Board - FOB). MPS and Budgetary Transfers (BT) are the two components of PSE.

PSE and related indicators have been calculated for 2009-11 following OECD methodology by FAO (2013).



This base line will be compare with the information to be collecting in 2015 to complete the study “Estimates of support to the agricultural sector to monitor agricultural policy updated and published” as part of the conditions in the policy matrix.

Annex I describes the PSE and related indicators and the methodology to be applied in detail.

**2. INFORMATION TO BE COLLECTED**

Besides collecting the indicators mentioned in the previous sections, the evaluation of this PBP will require the development of the Product Support Estimates and related indicators study. This analysis requires data collection on prices and production, as well as budgetary data collection. IDB will be hiring FAO for the second estimation of these indicators in 2015.

**3. WORKING PLAN AND BUDGET**

Table 4 presents the working plan with all the milestones needed to implement the impact evaluation methodologies described above. Also, the budget and responsible institutions for each activity are described. Prior to complying with conditions of the last individual operation comprised in the PBP, the team will prioritize and request Technical Cooperation Funds to estimate and report outcome and output indicators that will allow to conduct the before-and-after comparison. In the event that Technical Cooperation resources are not available, the team will request administrative (transactional) resources to complete the proposed before-and-after comparison. The estimated resources include, those needed to update the TFP for livestock and crops.

**Table 4: Working Plan, Actors and Activities**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Activities** | **2014** | **2015** | **2016** | **Responsable** | **Cost** | **Financing Source** |
| Design and approval of second programmatic Loan |  |  |  |  |  |  |  |  |  |  |  |  | IDB / LVV | - | Not applicable |
| Estimates of support to the agricultural sector to monitor agricultural policy updated |  |  |  |  |  |  |  |  |  |  |  |  | IDB/FAO | 50,000 | IDB Resources. Administrative funds or Technical Cooperation |
| Design and approval of third programmatic Loan |  |  |  |  |  |  |  |  |  |  |  |  | IDB /LVV | - | Not applicable |
| Impact Evaluation Report |  |  |  |  |  |  |  |  |  |  |  |  | IDB / LVV | 30,000 | IDB Resources. Administrative resources or Technical Cooperation |

**Total: US$80,000**

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Annex 1.

## Methodology

#### General introduction to the methodology

The estimates of support to the agricultural sector in Suriname are calculated using the methodology of Producer Support Estimates (PSE). The PSE methodology was developed by the OECD in the 1980s and has been applied in both OECD member and non-member countries since 1987. It serves as an instrument for estimating the level of domestic support to agriculture and to compare support internationally and over time. Because of their quantitative nature, information can serve as evidence to monitor and evaluate developments of agricultural policies and as a common base for policy dialogue. For that reason, the PSE methodology is also used by a wide range of international organizations and financial institutions (including the WTO, FAO, the World Bank and the IDB).

For calculating levels and composition of public sector support to agriculture, the PSE focuses on two main components:

* Market Price Support (MPS) is measured as a gap between domestic and reference prices.
* Budget Transfers (BTs)

Positive PSE means that farmers are benefiting from government policy providing support to agriculture, but, at the same time, also indicates that market distortions exist. Negative levels of PSE mean that implicit taxation of domestic producers occurs as a result of agricultural policy or market distortions.

The list of definitions used in PSE, Consumer Support Estimate (CSE) and Total Support Estimate (TSE) is presented in Box 1.

Box . Definitions used in Producer Support Estimate, Consumer Support Estimate and Total Support Estimate

**Producer Support Estimate – PSE**: the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

**Percentage PSE (PSE%)** – PSE as a share of gross farm receipts.

**General Services Support Estimate - GSSE**: the annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

**Consumer Support Estimate – CSE:** the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products.

**Percentage CSE (CSE%) -** CSE as a share of consumption expenditure (measured at farm gate) net of taxpayer transfers to consumers.

**Total Support Estimate – TSE**: the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

**Percentage TSE (TSE%)** – TSE as a share of the GDP.

**Single Commodity Transfers - SCT**: the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policies linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

**Percentage Single Commodity Transfers - SCT%:** the commodity SCT as a share of gross farm receipts for the specific commodity.

**Market Price Support (MPS):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.

Source: OECD, 2010.

The value of budgetary support of general services to producers is measured by the GSSE indicator. The GSSE refers to the support provided to agricultural producers collectively, such as expenditure related to agricultural extension, research, technical assistance and infrastructure. The support or taxation of consumers of agricultural commodities is measured by the Consumer Support Estimate (CSE). Together the three indicators PSE, GSSE and CSE compose the Total Support Estimate (TSE), i.e. the total transfers from consumers and taxpayers to agricultural producers associated with agricultural policy. The TSE can be used to indicate the total level of public sector support to agriculture in a given country.

PSE and CSE, as well as PSE components, are often measured in a percentage form, as a share of total farm receipts (receipts from output and budget transfers).

The Market Price Support (MPS) component of the PSE is taken as the difference between the observed domestic price received by farmers, and the international reference price that represents the value of the commodity in the international market. The reference price is considered to be the price that domestic producers could have received for their products in the absence of any domestic or trade policy affecting this commodity's market. Usually, these reference prices are usually calculated on the basis of border prices of imports (Cost, Insurance and Freight - CIF) and exports (Free On Board - FOB). If no reliable border prices are available, it is also possible to use specific border prices in close neighbour countries or in the countries playing a major role in international trade of the commodity, or the prices that prevail on international commodity exchanges.

Reference prices and producer's prices for MPS calculations must be measured at the same point in the value chain. In order to make the two prices comparable, the reference (border prices) must be adjusted for marketing margins in order to become comparable with farm-gate producer prices. This adjustment means that the costs of processing, handling and transportation to the market where domestically produced commodity meets the commodity from the foreign market, must be deducted from the reference price. In addition, quantity or quality adjustments could be applied to ensure that the traded good is comparable with the product as it is sold by the farmer.

The price adjustments are carried out as follows:

*For imported commodity:*

CIF price + costs of transporting the product from the border to the internal wholesale market (T1) = price of imports at domestic market level - cost of transporting the product from the wholesale market to the farm gate (T2) - costs of processing farm product into imported product (S) = price of imports in farm gate equivalent.

*For exported commodity:*

FOB price - handling and transportation costs between border and domestic wholesale market (T1) - handling and transportation costs between wholesale market and the farm gate (T2) - costs of processing of farm product into exported product (S) = price of exports adjusted to the farm gate level.

The Budget Transfers (BT) component of the calculations consists of the public expenditure in support of the agricultural sector. In general terms, these expenditures consist of three main groups:

1. economic transfers from the government budget to agricultural producers (e.g. input subsidies)
2. financing of general services that support agriculture collectively (e.g. extension services or spending on agricultural research)
3. transfers to consumers (e.g. food aid or other food subsidies).

The transfers to agricultural producers are included in the PSE indicator, while public expenditure that benefits the sector as a whole is used in the GSSE. Finally, support to consumers is taken into account in the calculation of the CSE. A thorough analysis of the budget of the Government of Suriname has been carried out to obtain an understanding of the nature and characteristics of the public sector’s spending in support of the sector, and to distinguish the different types of budget support that the Government provides.

#### Assumptions and general approach to budget support PSE component calculations

 A number of assumptions is applied to make sure the level of public sector support to the agricultural sector in Suriname is calculated correctly:

* Transfers to agricultural producers that benefit individual farmers or group of farmers must be included in the PSE. When the transfers benefit the agricultural sector as a whole, they are considered support to general services and, as a result, are included in the GSSE.
* Transfers to first consumers of agricultural production (agro-processors) and food aid programs are included in the consumer support indicator CSE. However, as primary agriculture is often the final beneficiary of the subsidies to agro-processing sector, these subsidies can be included in the PSE. The reasoning for attribution of those transfers to PSE or CSE is discussed below separately for each transfer, where this is applicable.
* Budgetary transfers to producers, which are part of the PSE, are presented as a matrix structure where PSE categories are presented along the vertical axis and PSE labels along the horizontal axis. Categories and labels indicate the way the policy program is implemented. The classification and labels of Budget Transfers are given in Table 2.

As shown below, categories indicate the base on which the transfer or subsidy is calculated, such as value of production, number of animals, input use, services provided, income or non-commodity criteria. Labels are used for each category and provide a more detailed understanding of the implementation of each policy measure.

Table : Classification of Budget Transfers in the PSE according to OECD methodology

|  |
| --- |
| **Categories** |
| *A. Support based on commodity output*  |
|  A.1. Market Price Support |
|  A.2. Payments based on output |
| *B. Payments based on input use* |
|  B.1. Variable input use |
|  B.2. Fixed capital formation |
|  B.3. On-farm services |
| *C. Payments based on current A (Area) /An (Animal number) / R (Receipts) /I (Income), production required* |
|  C.1 Based on current receipts/income |
|  C.2 Based on current area/animal number |
| *D. Payments based on non-current (historical or fixed) A (Area) /An (Animal number) / R (Receipts) /I (Income), production required* |
| *E. Payments based on non-current A (Area) /An (Animal number) / R (Receipts) /I (Income), production not required* |
|  E.1. Variable rates (vary with respect to levels of current output or input prices, or production/yields and/or area) |
|  E.2. Fixed rates |
| *F. Payments based on non-commodity criteria* |
|  F.1. Long-term resource retirement  |
|  F.2. Specific non-commodity output |
|  F.3 Other non-commodity criteria |
| *G. Miscellaneous payments* |
| **Labels** |
| -- With/without L (current commodity production limits and/or limits to payments) |
| -- With V/F rates (variable or fixed payment rates) |
| -- With/without C (input constraints). |
| -- With/without E (commodity exceptions). |
| -- Based on A/An/R/I (Area/Animal number/Receipts/ Income). |
| -- Based on SC/GC/AC (a single commodity, a group of commodities or all commodities). |

The second category of Budget Transfers are those that benefit the agricultural sector collectively. This expenditure on so-called general services has been separated from the PSE and is instead being calculated as a separate indicator, the General Services Support Estimate (GSSE). As can be seen from Table 3, the spending to general services is divided into seven broad categories.

Table . Classification of Budget Transfers in GSSE According to OECD Methodology

|  |
| --- |
| **Categories** |
|  H. Research and development |
|  I. Agricultural Schools |
|  J. Inspection Services |
|  K. Infrastructure |
|  L. Marketing and Promotion |
|  M. Public Stockholding |
|  N. Miscellaneous |

Source: OECD, 2010.

1. The proposal will specify the IMWGFS objectives, activities, composition and expected outputs. [↑](#footnote-ref-2)
2. Draft Plant Protection Act follows International Plant Protection Convention (IPPC) guidelines. [↑](#footnote-ref-3)
3. Objectives, vision, and work-plan for the IDCU have to be completed in order to establish it. [↑](#footnote-ref-4)
4. FAOSTAT (2013) [↑](#footnote-ref-5)
5. Economist Intelligence Unit, 2013 [↑](#footnote-ref-6)
6. World Trade Organization, 2013 [↑](#footnote-ref-7)
7. <http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36784143> [↑](#footnote-ref-8)
8. Master Plan for the Supply and Distribution or Irrigation Water for Agricultural Production in the Nickerie District. EU project 2009/224359. Work performed by HTSPE Limited [↑](#footnote-ref-9)
9. See footnote 2 [↑](#footnote-ref-10)
10. An agricultural survey is run quarterly for annual crops and annually for permanent and semi-permanent crops. These surveys collect basic data. In the survey they also collect livestock and poultry information. Even though it is called a survey, it is not a probabilistic survey. Extension officers visit the farms and on top of doing their extension work, they collect the survey data. [↑](#footnote-ref-11)
11. The proposal will specify the IMWGFS objectives, activities, composition and expected outputs. [↑](#footnote-ref-12)
12. Draft Plant Protection Act follows International Plant Protection Convention (IPPC) guidelines. [↑](#footnote-ref-13)
13. Objectives, vision, and work-plan for the IDCU have to be completed in order to establish it. [↑](#footnote-ref-14)
14. The Malmquist Index (Färe et al., 1994), a non-parametric methodology, will be used to estimate total factor productivity, accounting for livestock an crops. Official secondary data, reporting output production and inputs used, will be employed. [↑](#footnote-ref-15)
15. **Producer Support Estimate – PSE**: the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. [↑](#footnote-ref-16)
16. **GSSE**: the annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers. [↑](#footnote-ref-17)
17. **Consumer Support Estimate – CSE:** the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. [↑](#footnote-ref-18)
18. **Total Support Estimate – TSE**: the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products. [↑](#footnote-ref-19)
19. **Market Price Support (MPS):** the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level [↑](#footnote-ref-20)