**SURINAME**

**SUPPORT OF MODERNIZATION OF PUBLIC AGRICULTURAL SERVICES**

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**IRRIGATION AND DRAINAGE**

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# List of acronyms

ADRON-SNRI, Anne van Dijk Rijst Onderzoekscentrum Nickerie- Stichting Nationaal Rijstonderzoeks Instituut

FAO, Food and Agricultural Organisation

IDB, Inter-American Development Bank

LVV, Ministry van Landbouw, Veeteelt en Visserij (*Ministry of Agriculture, Animal Husbandry and Fisheries*

OW MCP, Overliggend Waterschap Multi-Purpose Corantijn Canal

RCU, Rice Coordination Unit

SML, Stichting Machinale Landbouw (*Foundation for Agricultural Machine*)

SNRI, Stichting Nationaal Rijstonderzoeks Instituut (*Rice Research Station of* **Suriname)**

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## Introduction

IDB’s country strategy (2011-2015) for Suriname identifies agriculture as a priority sector for poverty reduction. Agriculture in Suriname is mainly concentrated in the irrigated production of rice, banana and horticulture in the coastal plains. However, since the 80s the agricultural sector has experienced a decline in production and productivity. As part of the government effort to boost agricultural production, the UE funded a program to “Support the Competitiveness of the Rice Sector in the Caribbean”, which was implemented between 2004 and 2010, and under which existing Water Boards (WBs) were revitalized with the main objective of improving irrigation and drainage efficiency and, in turn, rice productivity.

Currently, there is an ongoing national policy initiative for the rice sector, materialised in the creation of the Rice Coordination Unit (RCU), which aims to increase production, cultivated area and exports. RCU involves the role of the Water Boards in Nickerie, and is aware of the role and limiting effects of inadequate irrigation and drainage management and deteriorating water quality (salinity content).

Based on various documents and the consultants' interviews, there is a wide consensus on the following facts about irrigation and drainage in Suriname:

1. There is poor coordination at the Ministerial level, both in running the engineering systems, and planning and even executing investments
2. Institutions at the bottom of the organisations (farmers and WBs) are still weak
3. There is a complete lack of financial contributions by water users, and as a consequence complete reliance on Governments' budget
4. Water works and infrastructure have lacked proper maintenance and insufficient investments and plans
5. Engineering solutions for the most critical problems have been defined
6. While problems at the technical, administrative and institutional levels have been thoroughly analysed and even diagnosed in previous consultancies, there has been very little follow-up and continuity of previous policy proposals and planning initiatives.
7. There is a clear lack of leadership in addressing the problems with clarity and determination
8. There is poor coordination when running the irrigation (water supply) and drainage operations, resulting in peak unmet demands, lack of coordination, wasted resources and lower land and water productivity.
9. There is a lack of training and commitment of WBs representatives and farmers
10. Lack of land titling and excessive fragmentation of land uses among heirs, many of which emigrated to Europe, may also be limiting investment in agriculture and becoming an impediment for obtaining formal credit.

This report provides a diagnosis of Suriname’s irrigation and drainage systems and identifies a number of policy reforms that could be implemented as part of policy based operations (PBL).

## Description of Suriname's irrigation and drainage systems

### Basic facts: production, trade and prices

Suriname’s agricultural production is mainly concentrated in the Nickerie, Coronie and Saramacca districts, being paddy rice and banana, jointly with some vegetable production, the most important irrigated crops. The area dedicated to banana production amounts to 12,000 ha in the Nickerie district, and is run by the state-owned Banana State Company.

The Nickerie district concentrates nearly 90-95% of rice production, which is cultivated by individual farmers, most of them from a Hindi origin. Sown area in the current season covers 24,000 ha, which is half of the rice cultivable area. Due to a longer dry season and acute saline intrusion, the cultivated area this season is slightly lower than in previous ones, when the rice cropped area covered nearly 27,000 ha. The objective of the Ministry of Agriculture, as reported by the Regional Coordinator of Nickerie and Coronie, is to increase the rice production area up to 50,000 ha/year and to reach the 90,000 ha/year in the long term. However, the major limitation for extending the area under production is the lack of water availability in the dry season. This lack of water availability can be mitigated by improving and expanding water works and infrastructure[[1]](#footnote-1), and by implementing a number of management measures at the district level that have been already identified in various previous consultancies (see footnote 7).

In the Nickerie district stand the city Wageningen and the old SML processing plant settled by Wageningen University (the Netherlands). The original SML covers 10,000 ha of paddy rice production. However, after the independence in 1975, SML was transferred to the Suriname’s government and eventually collapsed. Nowadays, only 2000 out of the 10,000 ha are being cultivated by previous SML workers and 3000 ha are not under cultivation. The remaining 5000 ha are state-owned. So far, government’s medium-term plan is to establish sugar cane for ethanol production in this area.

Rice production in the Coronie district has been abandoned in the last years. Currently, 200 ha of rice are cultivated by a single producer. However, there are 4000 ha available for paddy rice cultivation. Nearby the rice paddies, there are coconut trees that use drainage water from rice irrigation. In the Saramacca district, paddy production extends over 1000 ha. Table 1 summarizes rice production areas in the current season and the potential areas available.

Table 1. Rice area cultivated and potentially cultivable (ha)

|  |  |  |
| --- | --- | --- |
| **District** | **Rice area (ha, current season)** | **Rice cultivable area (ha)** |
| Nickerie | 24,000  2000 | 40,000  10,000 |
| Coronie | 200 | 4,000 |
| Saramacca | 1000 | 3,500 |
| TOTAL | 27,200 | 57,500 |

Source: Based on the interviews with 1) District Commissioner of Coronie and 2) Regional Coordinator of the Ministry of Agriculture for Nickerie and Coronie.

According to ADRON experts, rice yields in Nickerie average 3 ton/ha but can reach 5 ton/ha in the case of some good performing farmers. On average, Suriname has a yield gap if compared with Central America and South America averages of 4.2 ton/ha and 5.3 ton/ha in 2011, respectively (FAO, 2013). The Caribbean rice yield average is slightly lower than the Suriname’s average. In addition, average yield in Suriname is lower than in neighboring countries such as Guyana and Venezuela. The yield gap is similar when considering the top 5 world rice producers in 2011 (i.e. China, India, Indonesia, Bangladesh and Vietnam). Considering other region's countries, Suriname's yields are lower than those in Brazil, Guyana and Venezuela, but higher than in French Guyana. However, the yields reported by the Ministry of Agriculture (MoA) are higher than the ones recorded at Anne van Dijk Rijst Onderzoekscentrum Nickerie (ADRON) and the ones suggested by the Overliggend Waterschap MCP (OW MCP). According to the IAB, rice yields in Suriname are above regional averages and in line with the yields in USA or Spain. Data provided by Table 2 reports rice average yields in relevant regions and countries and Figure 1 compares rice yields in Suriname and Guyana (FAO, 2013). Before 2006, yields in Suriname had gone down between 1997 and 2003 by 10% (Poerschke, 2005).

Table 2. Rice yields in Suriname, top-10 producer countries in 2011 and Latin American & Caribbean regions (ton/ha, period 2006-2011)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Region** | **Countries** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** |
|  | Suriname (FAO) | 4.1 | 4.3 | 4.2 | 4.2 | 4.2 | **4.1** |
|  | Suriname (ADRON) |  |  |  |  |  | **3-5** |
|  | Suriname (MoA) |  |  |  |  |  |  |
|  | Average |  |  |  |  |  | **5.6** |
|  | Small-farmers |  |  |  |  |  | 6.8-7 |
|  | Best performers |  |  |  |  |  | 8.1-8.2 |
|  | Suriname (OWMCP) |  |  |  |  |  |  |
|  | Realistic |  |  |  |  |  | **4-5** |
|  | Good |  |  |  |  |  | 6 |
|  | Very good |  |  |  |  |  | 8 |
| Top-10 producers | China | 6.2 | 6.4 | 6.6 | 6.6 | 6.5 | 6.7 |
| India | 3.2 | 3.3 | 3.3 | 3.2 | 3.4 | 3.5 |
| Indonesia | 4.6 | 4.7 | 4.9 | 5.0 | 5.0 | 5.0 |
| Bangladesh | 3.9 | 4.1 | 4.1 | 4.2 | 4.3 | 4.2 |
| Viet Nam | 4.9 | 5.0 | 5.2 | 5.2 | 5.3 | 5.5 |
| Thailand | 2.9 | 3.0 | 3.0 | 2.9 | 2.9 | 3.0 |
| Myanmar | 3.8 | 3.9 | 4.0 | 4.1 | 4.1 | 4.1 |
| Philippines | 3.7 | 3.8 | 3.8 | 3.6 | 3.6 | 3.7 |
| Brazil | 3.9 | 3.8 | 4.2 | 4.4 | 4.1 | 4.9 |
| USA | 7.7 | 8.1 | 7.7 | 7.9 | 7.5 | 7.9 |
| Neighboring countries | Venezuela | 5.0 | 5.1 | 5.2 | 5.0 | 5.0 | 5.7 |
| Guyana | 4.6 | 4.3 | 4.2 | 4.4 | 4.2 | 4.8 |
| French Guiana | 1.7 | 2.3 | 2.3 | 2.3 | 2.2 | 2.5 |
| Latin America & Caribbean | Central America | 3.6 | 3.5 | 3.8 | 3.8 | 4.1 | 4.2 |
| Caribbean | 3.6 | 3.8 | 3.6 | 2.7 | 2.7 | 2.8 |
| South America | 4.5 | 4.5 | 4.8 | 4.9 | 4.6 | 5.3 |

Source: FAO (2013)

Figure 1. Rice yield in Suriname and Guyana (ton/ha), period 2000-2010



Source: FAO (2013)

Suriname and Guyana compete for the export market to the Caribbean countries. Guyana’s rice production is twice Suriname’s production. This is mainly explained by the larger area harvested in Guyana, as it can be observed in Figure 2.

Figure 2. Rice, area harvested in Suriname and Guyana (1000 ha).



Source: FAO(2013)

Suriname’s rice exports represent between 10-35% of total rice production depending on the year when considering the period 2000-2010 (FAO, 2013). In this same period, Guyana rice exports oscillate between 30-55% of rice production. Figure 3 shows the export value per tonne exported from both countries. Overall, Suriname’s trend has been downward sloping from 2000 to 2007, approximately, experiencing a slight recover at the end of period. Guyana shows a positive trend in the period 2000 – 2010.

Figure 3. Exports value US$ per ton exported.



Source: FAO(2013)

It is interesting to compare Suriname’s rice producer prices to the producer prices of some of the major world rice producers. As shown in Figure 4, producer prices in Suriname are generally below the prices of major producers, this may be due to poorer quality and marketing structure.

Figure 4. Producer price, rice (US$/ton).



Source: FAO(2013)

Surinamese irrigation and drainage status is known to require improvements to become more productive and stable. Right now, the Government takes on most responsibilities, finances most regular operation and maintenance costs and makes all investments in irrigation systems’ rehabilitation. Its land, soils and water resources have tremendous potential to produce commodities, whose prices all world institutions project to be on the rise (see graph from FAO, AMIS, Figure 5).

Figure 5. Producer price, rice (US$/ton).



Source: Agricultural Market Information System (<http://www.amis-outlook.org/>)

Both world production and trade have been steadily growing in the last 10 seasons. Stocks are expected to reach 170 million tones en 2012-13, which will hit a record since season 2002/2003, reducing thus probability of marked price swings (see Figure 6).

Figure 6. **World production and trade (Rice, Milled equivalent) million Tonnes**

Source: Agricultural Market Information Systems. http://statistics.amis-outlook.org/data/index.html

### Irrigation and drainage systems: polders and water boards

Irrigation and drainage systems have been mostly developed in the district of Nickerie as a result of developing polder cultivation systems for rice production. There are a total of 22 polders in the Nickerie district. Table 3 reports the major water sources for irrigation in Nickerie, Coronie and Saramacca.

Table 3. Polders’ location and water source for crop irrigation.

|  |  |  |
| --- | --- | --- |
| Location | Average land size (ha) | Water source |
| Eastern/Western Nickerie | < 4 | Nanni Swamp and Corantijnkanaal |
| South Nickerie | 4 < size < 24 (small group) |
| Left bank Nickerie river | size > 24 (small group) |
| Right bank Nickerie river | 4 < size < 24  size > 24 | Nickerie river / Wageningen |
| Coronie | -- | Coronie Swamp |
| Saramacca | -- | Coesewijne Swamp  Swamp right bank Saramacca river |

Source: Own elaboration based on Naipal (2005)

Water Boards (Waterschappen) were developed during the colonial period, and date back to the 1930s, but after the independence in 1975 were progressively abandoned. In 2004, the EU funded project “CARIFORUM Rice Programme: Support to the competitiveness of the rice sector in the Caribbean” attempted to revitalize water boards. As a result, 14 water boards were projected in Wanica and Nickerie districts (see Table 4) and a new Water Board law was enacted in 2005. Up to date only 6 of these water boards have been revitalized, but none of them is currently under active operation. In addition, the Multipurpose Corantijn Project, although in place since 1984, was reactivated in 2006 with the objective of managing the Corantijnkanaal and the Wakay pumping station. As shown in Table 3, the Corantijnkanaal provides water to the polders located in the Eastern, Western and left bank of Nickerie river. In this respect, it was designed to expand rice irrigated area by 12,500 ha.

Table 4 provides a list of the Water Boards, and includes basic data describing its specific characteristics. An outstanding feature in all of them is the number of farmers, and the small average size of their farms. These represent significant obstacles to make WBs more active, encompassing and effective.

**Table 4. Water boards list by district**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **Water Boards** | **Area**  **(ha)** | **Formation day** | **Total parcels** | **District** | **Main crop** | **N of. farmers** |
| 1 | Henarpolder | 2,242 | 26 april 2006 SB 6-5-2006 no.45 | 605 | Nickerie | Rice | 598 |
| 2 | Europolder-Noord | 1,035 | 26 april 2006 SB 6-5-2006 no.46 | 164 | Nickerie | Rice | 160 |
| 3 | Corantijnpolder | 747 | 26 april 2006 SB 6-5-2006 no.47 | 573 | Nickerie | Rice | 573 |
| 4 | Sawmillkreekpolder | 481 | 26 april 2006 SB 6-5-2006 no.48 | 219 | Nickerie | Rice | 97 |
| 5 | Hamptoncourtpolder | 894 | 26 april 2006 SB 6-5-2006 no.49 | 591 | Nickerie | Rice | 540 |
| 6 | Van Drimmelenpolder | 850 | 26 april 2006 SB 6-5-2006 no.50 | 568 | Nickerie | Rice | 568 |
| 7 | Clarapolder | 1,366 | 27 dec 2007 SB 17-1-2008 no.2 | 455 | Nickerie | Rice | 365 |
| 8 | Uitbr. Gr-Henarpolder 1 & 2 | 1,804 | 27 dec 2007 SB 17-1-2008 no.3 | 172 | Nickerie | Rice |  |
|  | Europolder-Zuid | 1,140 | 27 dec 2007 SB 17-1-2008 no.4 | 214 | Nickerie | Rice | 214 |
| 10 | Paradise & Longmay | 980 | 27 dec 2007 SB 17-1-2008 no.5 | 922 | Nickerie | Rice | 536 |
| 11 | Nanni- &Brutopolder | 1,447 | 27 dec 2007 SB 17-1-2008 no.6 | 266 | Nickerie | Rice | 262 |
| 12 | Wasima (Waldeck,Sidoredjo & Margarethenburg ) | 352 | 27 dec 2007 SB 17 -1-2008 no.7 | 370 | Nickerie | Rice | - |
| Total |  | 13,438 |  | 5,119 | Nickerie | Rice | - |
| 13 | Overliggend Waterschap MCP | 31,198 | 21 mei 2007 SB 13-6- 2007 no.75 |  | Nickerie | rice,b anana and others | - |
| 14 | Reeberg | 700 | 21 dec 2009 SB 191 | 46 | Param. | Animal husbandry | - |

Source: LVV, Mat 8, 2013, & Ministry Regional Development (<http://www.gov.sr/sr/ministerie-van-ro/actueel/waterschappen-in-suriname.aspx>) and Naipal (2005).

Three Water Boards have been already rehabilitated by the MoA (Sawmillkreekpolder, Hamptoncourtpolder and Van Drimmelenpolder). Rehabilitation of the Cornatijnpolder has already being contracted and both Henarpolder and Europolder-Noord are under current projection. The MoA has a 2013-budget of 40 million SRD for rehabilitation and 13 million SRD for regular maintenance of the infrastructure. In addition, according to data provided by the MoA, annual maintenance costs amount to 200-300 SRD per ha (US$ 60-70 per ha), which is equivalent to the price of a rice bag (79 kg) - % of total costs. Ministries' budget for maintaining and supporting irrigation and drainage is detailed in Table 5.

**Table 5. Government expenditure on investment & maintenance of irrigation works**

Source: C. Delangen (FAO, parallel consultancy and ongoing)

Note: the per hectare value in the bottom row is calculated over 33,000 hectares

Note: US figures converted at May 2013 exchange rates. 1 SRD = 0.3 USD

As can be seen in Table 5, the largest contributor is the Ministry of Public Works. In terms of irrigated area, the Surinamese Government has spent quite unstable amounts in the last years, ranging from US 43 per hectare in 2010, to almost 900 the previous year. Table 6 reports the costs of OW MCP.

Table 6. Operation and Management costs and investments of OW MCP

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | (1000 SRD) | | | ( SRD /ha) | | |
| COST OW MCP | OPERATIONAL | INVESTMENT | **TOTAL** | OPERATIONAL | INVESTMENT | **TOTAL** |
| 2010 | 965 |  | 965 | 30.9 | 0.0 | 30.9 |
| 2011 | 1131 |  | 1131 | 36.3 | 0.0 | 36.3 |
| 2012 | 1028 | 32 | 1060 | 33.0 | 1.0 | 34.0 |
| 2013 | 1540 | 206 | 1746 | 49.4 | 6.6 | 56.0 |

Source: Data provided by LVV (Ministry of Agriculture)

Based on published materials and the academic literature a cost of SRD 56 per ha (US 17 per ha) can be considered in the low range across the world and in the region of Latin America and the Caribbean.

### Water legislation and (current) institutional map

Regarding current water governance system, three Ministries take part in the management of irrigation and drainage systems. The Ministry of Public Works is responsible for the management of primary canals. The Ministry of Agriculture is also involved in the maintenance of primary canals and the supply of water for irrigation. In addition, the Ministry of Regional Development is in charge of the construction and maintenance of the canals that are not under the responsibility of either the Ministry of Public Works or the Ministry of Agriculture. However, in practical terms, the boundaries among the three ministries are not in all cases well-defined which, in turn, implies that some areas are not properly.

Under the government plan of revitalizing the water boards, MoA is in charge of setting up the irrigation infrastructure so that the water boards can take up on the management subsequently. The Ministry of Regional Development is also involved in this task, as it is the government body responsible for the approval of water boards’ regulations, including the operational by-law (called “keur” in dutch). However, although infrastructure of some water boards has been renewed, the Ministry of Regional Development has only approved the by-law of Sawmillkreekpolder Water Board. The infrastructure of Hamptoncourtpolder and Van Drimmelenpolder has been rehabilitated by the MoA but the operational by-law has not been approved yet.

In order to deal with some of the coordination problems mentioned above, the Water Authority Board was formed and included the three ministries involved in water management and the MCP OW. Its competencies have not been defined, and nobody mentions it in discussing irrigation and drainage issues. In addition, the Ministry of Natural Resources has appointed a steering committee to propose a water policy for the government. As part of the activities carried out by this committee, a workshop was organized on March 2013. A number of water experts were invited to present and discuss issues on integrated water management and an outcome report from the workshop is currently under elaboration. This report will include a water policy roadmap and will be presented to the Ministry of Natural Resources and the Vice-president of the Republic.

**Box 1. Overview of the task of the ministries that are involved in the management and maintenance of the infrastructure in the rice sector**

|  |
| --- |
| Ministry of Agriculture, Animal Husbandry and Fisheries (MoAAHF) is responsible for the maintenance of the primary infrastructure (roads, irrigation and drainage canals, bridges and sluices) in the relatively new polders “landaanwinningspolders” ; 9,110 ha (Nickerie ),4,000 ha (Coronie ) and SML area (5,000 ha), in total 18,110 ha.  • Ministry of Public Works (MoPW) is responsible of the construction and maintenance of the primary roads, irrigation and drainage canals, sluices and other infrastructural works.  • Ministry of Regional Development (MoRD), has to take care of the construction and maintenance of the secondary roads, irrigation and drainage canals and other infrastructural works.  The District commissioners are representatives of MoRD, so the task are in this field the same. |

Source: LVV, May 8, 2013.

## Diagnoses of main problems and difficulties

Irrigation and drainage problems in Suriname have been documented and characterized by at least three previous consultancies[[2]](#footnote-2). As compared to other countries in the region, they can be characterized by poor systems’ maintenance and the lack of users’ participation in running the systems and in defraying the O&M costs. This observable outcome explains to some extent the lower water use efficiency levels and crop productivities and the mishandling of financial and ecological resources (i.e. lack of cost recovery and water overuse). Although these problems can be easily identified, none of them can be attributable to a single cause, but rather to the interaction of the social and ecological variables that characterize the water sector. Furthermore, they are the outcome of a process of decay, which began in the last decade of the last century, but was exacerbated by the downward trend of rice prices until the sudden rise in 2007, and the lack of governmental support. This is the classical vicious cycle that has brought to an end (see Figure 6).

Figure 6. Classical vicious cycle of decaying irrigation and drainage institutions and works.



Figure 7 summarizes the major problems found in the sector and enumerates some of the factors that might explain the outcomes observed. Figure 7 follows the Social-Ecological Framework developed by Ostrom (2007) to analyze the sustainability of systems in which there are strong human-nature interactions. The water system is therefore composed of the governance system (GS), users (U), resource system (RS) and resource units (RU). In addition, it is embedded within the social and economic setting (S) and it is affected by related ecosystems (ECO).

In the case of the Surinamese WBs, a failed attempt in 2007 to revitalize them is now been followed by a renewed momentum. However, after various interviews with key actors in Suriname, the difficulties have not subsided, as attested by the fact that in some WBs there have not been volunteer candidates for the election of representatives. A large number of small farmers is not the ideal situation to create trust, and incentivize participation.

For this reason, the role of OW MCP and of the Ministries of Public Works and Agriculture is essential to bring about significant changes in the WBs’ role, and actions.

Figure 7. Diagnose of the factors affecting the irrigation sector performance in Suriname.



In the following section, each problem is associated with a set of causes and origins. They are ordered from top (global, encompassing and related to the social and economic setting) to down (local, WB and farmer level). However, this order is a simplification, as causation runs up and down reinforcing problems, and giving rise to feedback processes and a vicious cycle.

To break the vicious cycle, it is proposed that all the issues are addressed in parallel. The reason is that all negative factors have been reinforcing themselves and it is very unlikely that using a single entry point in the system will reverberate positively to all them, breaking the vicious cycle. This is depicted in Figure 8.

Figure 8. Policy reform elements

The proposed policy reform requires that some features be considered when thinking about past failed attempts to make a different in Surinamese irrigation and drainage. These are consistency, strategy, opportunity and responsibility.

**Consistency** means that actions and goals should build on what is already in place and working, avoiding major disruptions and erecting a coherent and well-ordered set of timely reforms. Consistency also means that Government’s support must be conditioned on certain activities and actions being implement in pre-arranged plans.

**Strategy** means that, counting on a long-term vision, the proposed policy includes top-down and bottom-up coordinated actions and goals, effective internal and external communication and a shared agenda.

**Opportunity** presents itself now because of relatively high and stable international rice prices, an ongoing 'capacity building programme' project, a bold initiative to form a coalition of shared national water policy goals[[3]](#footnote-3), and three previous consultancies, which have provided detailed technical, administrative and institutional recommendations.

**Responsibility** involves creating an agreed structure of roles, accountability and controlling mechanisms to enhance the role of the government and better coordinate the involved branches with lower-tier actors, including OW MCP and WBs.

Figure 9. Consistency, strategy, opportunity and responsibility for irrigation and drainage reform in Suriname.



* Maintain what it works
* Keep momentum of ongoing initiatives
* Avoid major disruptions
* Build on current knowledge
* Internal logic
* Value for money
* Top-down and bottom-up action
* Simultaneity of actions and initiatives
* Communication
* Determination
* Coordination at the top level
* Underlying long-term vision
* Who does what
* Who is accountable for
* Who controls who and what
* Who takes decisions
* Who shares costs and benefiits
* WBs and OW MCP revitalisation
* EU programme ‘Capacity Building’
* IDB Policy Loan
* Water Forum Suriname
* Previous diagnoses and consultancies
* Stable/high int’al price of rice

## Sequential policy reform package

In the following paragraphs a policy reform package structured in three tranches is proposed to overcome the problems described in the previous section. The type of policy changes proposed follow a hierarchical logic model. This means that tranche 1 changes need to be accomplished first in order to transition to tranche 2 tasks, and so on. The section is organized as follows: First, specific tasks to be carried out in each tranche are described, jointly with the expected deliverables. Second, a chronogram of activities is defined. Tranche 1 lays down with more detail the expected tasks and goals.

### Tranche 1

**Task 1.1**

As a first step toward policy change, the government needs to **engage** with stakeholders, users and officers in policy discussions in order **to coordinate** and launch an irrigation and drainage policy reform. The ultimate and long-term objective would be to create a Water Authority that implements integrated water resources management in the entire country, including all sectors and with a strong environmental focus.

At the moment, the objective is more modest, and limited to irrigation and drainage. For this purpose, a coordination unit (referred hereafter as ***Irrigation and Drainage Coordination Unit of Suriname IDCUS***) will be created and proposed to depend directly from the President's office. It will have four board members, chaired by the Permanent Secretary of the Ministry of Finance, with the Permanent Secretaries of the Ministries of Agriculture, Regional Development, Natural Resources and Public Works as the other three members. It will have a small secretarial staff, and an executive secretary, appointed by the President of the Republic and will have executive power. **IDCUS** will be accountable to the President, and to the National Assembly, to which it will present annual reports and participate in hearings. On occasions, *IDCUS* will have meetings with stakeholders, other government branches and private organizations.



**IDCUS** will lead the policy process reform and act as the main coordination unit of future irrigation and drainage operations, reforms, investments and policies.

The main **objectives** of**IDCUS** (described in Box 2) would be:

a) Engage in open discussions with all water users, managers and officers in charge of running, managing and administering irrigation, and with all water users to launch a stepwise, accorded and target-oriented policy reform.

b) Ensure closer coordination of the three Ministries with competencies on irrigation and drainage.

c) Ensure that adequate leadership and vision elements are visible for all those involved.

e) Ensure that all related officers, organizations and government branches are given the chance to contribute and participate, being of utmost importance that all related government, parastatal, and non-government organizations are aware of this initiative.

Box 2. Irrigation and Drainage Coordination Unit of Suriname (IDCUS)

|  |
| --- |
| ***IDCUS***   * Created by a Staatsbesluit (Decree), formed with the Permanent Secretaries of the Ministries of Finance, Agriculture, Natural Resources, Regional Development and Public Works (a Board of five members) * Chaired by the Representative (Permanent Secretary) of the Ministry of Finance * Run by an Executive Secretary, appointed by the Board, assisted by a small secretariat (4 people), provided by one of the Ministries[[4]](#footnote-4) * A simple webpage run by the Secretariat, with:   + repository of documents (Laws, Master Plans)   + minutes of meetings and agendas,   + events,   + a presentation letter drafted by the President of the Republic   + objectives of the Unit * Agendas in paper and minutes taken (minimum formality) * Will approve:   + WBs rehabilitation plans   + Funding proposals originating from each Ministry on irrigation and drainage   + Water management/investment plans (including OW MCP plan)   + Ministerial initiatives   + Significant repairing activities   + Significant water and drainage operations * Will revise:   + Significant infrastructure breakdowns   + Incidences * Will draft the:   + Principles of water charging for irrigation and drainage systems and creation of temporary water use rights * Accountable to the President of the Republic and to the National Assembly |

**Task 1.2**

**IDCUS** should lead the design of a feasible and flexible **roadmap** to: 1) attain self-managed and self-finance irrigation and drainage organizations; 2) increase irrigated agriculture productivity; 3) expand the production and extension of the agricultural sector.

These objectives are ambitious and there is very little chance that they may be accomplished in the short term. It is necessary to build the institutional set up and the architecture for cooperation and put them into practice. This will take time, and the government should not withdraw too early.

The institutional roadmap for erecting the ideal institutional setup should combine both bottom-up and top-down approaches with common goals and clear orientation. The bottom-up refers to the inclusion of WBs and farmers in the decision-making process. Top-down encompasses the political leadership of the government, materialized in the functioning of **IDCUS***.* In the middle stand organizations like the OW MCP, assisted and supported by the District Commissioner offices, which provide the connecting points of the other two, have technical knowledge and will assume tasks assigned by the **IDCUS***.*



The roadmap should at least include the following specific sub-tasks:

**Task 1.2.1**

Finalizing **WBs’ institutional design** (i.e. WBs’ “creation” Staatbesluits (Decrees) and WBs’ keurs (Operative by-laws) which defines operational, maintenance and monitor and sanctioning rules). WBs’ “creation” needs to be approved by Presidential Decree (see for example: “Staatsbesluit van 26 april 2006, houdende oprichting van het waterschap Samillkreekpolder en vaststelling van het Bestuursreglement (Bestuursreglement Waterschap Sawmillkreekpolder)”[[5]](#footnote-5)). WBs’ keurs need to be approved by the WB and the Ministry of Regional Development.

Fulfillment of task 1.2.1 will require: 1) Farmers’ participation in rules decision-making, 2) training on the operation and maintenance activities and 3) a capacity building program to support WBs' role at least during the first year and with a gradual reduced support during the subsequent years.

These activities are already ongoing. No change is proposed in the type of legal support, process or approach. Task 1.2.1's goal is simply to effectively setup formally all WBs.

**Task 1.2.2**

Finalizing the **rehabilitation WBs' infrastructure** based on a coordinated investment plan including the different government bodies involved in irrigation works. An ordered list of WBs will be made, considering the order in which actions defined in Task 1.2.1 are fulfilled.

These works are a continuation of the ongoing rehabilitation activities and works carried out by the Ministries of Agriculture, Regional Development, and Public Works.

**Task 1.2.3**

**Revise** already drafted **Master Plans[[6]](#footnote-6)**, and consolidate it in the *Suriname 2020 Water Vision: Irrigation & Drainage*. It is expected that this initiative on irrigation and drainage will eventually cover other water sectors and grow to generate a genuine integrated policy reform for the country.

In parallel with the completion of the institutional setup, the *Suriname 2020 Water Vision Irrigation & Drainage* must be drafted as an ideal configuration of specific drainage and irrigation works and functioning elements, simply compiling the recommendations of already existing Master Plans[[7]](#footnote-7). It will be open to comments and debate among stakeholders, WBs, other Ministries, the OW MCP, SNRI-ADRON, and the academic community.

However, **it is important that short-term and immediate results** be accomplished soon, so that users and stakeholders begin soon seeing tangible benefits. In this respect, **first-year specific works** and the **3-Ministries' budget earmarked to irrigation and drainage** needs to be detailed in the *Suriname 2020 Water Vision: Irrigation & Drainage* draft**.**

Task 1.2.3's objective is to draft the *Suriname 2020 Water Vision: Irrigation & Drainage*. This builds on already existing Master Plans and includes a list of short-term objectives and a list of urgent works to be carried out soon. All or some of these may already have identified by each Ministry separately.

**Task 1.3**

IDCUS' roadmap includes activities of other entities. Thus **OW MCP** will develop a detailed management program to run the water deliveries and drainage operations to the WBs under its command, with a view to ensure an orderly process of flooding and draining the polders. The objective of this detailed management program is to optimise available water resources, and meet the largest possible acreage.

It will have the following elements:

* + Detailed preparation plan to launch the operation of the pumping stations, including maintenance and fuel procurement.
  + A detailed formula for multi-year irrigation turns (those first one year, will last the following): a Water Rotation Scheme.
  + Specific operations of sluices, canals and other water flow control mechanisms.

This plan needs to be presented to the *IDCUS* who will revise it and approve the document in order to get the financial disbursement from the Ministry of Regional Affairs to launch its operations.

***Specific deliverables of Tranche 1***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1. Coordination | 2. Financial Framework | 3. Techn/Econ Efficiency | 4. Institutional strengthening | 5. Maintenance | 6. Investments infrastructure |
| **4 Ministries** | Appoint members at IDCUS | Keep their present roles and competencies | | | | M Reg Dev  Min Public Works  LVV |
| **IDCUS** | Created by Gov't Decree | Defines rules for approval Ministries' budget |  | IDCUS working rules approved | Approves 5-year maintenance plan  ↓ | Approves  ↓ |
| **OW MCP** | Works with WBs  (Coordination meetings) |  | GIS and Ledgers finished ↓ | Supports WBs  Completes Capacity Building ↓ | ↑  5-year Plan of Maintenance defined  Supports ↓ | ↑  5-year Plan of investments |
| **WBs (all in Suriname)** | Communication Plan with farmers |  | GIS ↑ Ledgers at WBs level accessible | Keurs ↑  Approved Elected representatives | ↑  Plan defined at polders' level |  |
| **LVV** | LVV coordinates with Rice Coordination Unit |  | Extension  Credit |  |  |  |
| **Min of Reg Devel** |  |  | Supports WBs  Completes Capacity Building  Keurs approved Elected representatives  (in WBs not under the domain of OW MCP | | |  |

### Tranche 2

Tranche 2 of the policy reform is proposed as a continuity of Tranche 1, which consists primarily on creating the conditions for policy action and completing processes already launched. Anything short of fulfilling all Tranche 1's goals would involve delaying the roadmap of the involved project's specific components (see below). Each Ministry will keep on proposing and executing separately specific works on its budget, but they will need to be approved by ***IDCUS***.

Upon the inception of Tranche 2, Government funds (from the three Ministries) allocated to maintenance, operation and investments in irrigation and drainage will be conditioned on IDCUS’ approval, considering the degree of implementation of Tranche 1.

The following tasks would follow from Tranche 2:

**Task 2.1**

**Government cabinet approves** the *Suriname 2020 Water Vision: Irrigation & Drainage* prepared by *IDCUS*.

**Task 2.2**

***IDCUS*** approvesthe *Suriname* *2020 Water Vision: Irrigation & Drainage***'s first-year specific works,** funded by the three Ministries' budget earmarked to irrigation and drainage. The works included here will be proposed by the Ministries, and as stated earlier, most likely these works have already being designed and defined.

Task 2.2 has the objective to ensure that the Ministries work together in designing and defining their works.

**Task 2.3**

As the major intermediate organization, OW MCP needs to be deeply involved in the infrastructure and policy change. As part of this participation, the following specific tasks for the OW MCP are proposed.

**Task 2.3.1**

After reaching a consensus with WBs and with the green light of ***IDCUS***, the **OW MCP approves** the **detailed management programme to run the water deliveries and irrigation operations of WBs** (as stated in Task 1.3, the running budget from Ministry of Regional Development to OW MCP will be conditional on approval this management programme, and having a good preparation of the season's irrigation operations without delay).

**Task 2.3.2**

**OW MCP** prepares, after reaching a consensus with WBs and with the green light of ***IDCUS***, a **detailed management programme to run the water deliveries to the WBs** (running budget of OW MCP conditional on approval this management programme, and having a good preparation of the season's irrigation operations without delay).

**Task 2.3.3**

In consultation with SNRI-ADRON, Rice Coordination Unit and LVV officers, OW MCP should elaborate a **document**, approved by WBs, detailing the **benefits and costs of land leveling** for the rice paddies, including water volumes saved and the implications for all WBs. This document can build on those already prepared by OW MCP, but it would need to include a cost benefit analysis of land leveling. This document will have graphical descriptions and will be distributed to the WBs and farmers. A poster will be printed and posted in the main offices that farmers visit to run their businesses.

This document will also feed the document **“Principles of water charging and water rights for irrigation and drainage systems”** as land leveling might be used as a condition for benefiting from a reduction on the water fee paid (see Task 2.4).

**Task 2.3.4**

Based OW MCP's costs, already presented in Table 6, IDCUS will commission OW MCP drafting a report on “Principles of water charging and water rights for irrigation and drainage systems” (see Task 2.4), which will include:

* Detailed cost estimates of running irrigation and drainage, at the lowest possible level (this estimation will also be the responsibility of OW MCP).
* A brief analysis of water charges in irrigation districts around the world.
* Definition of temporary water use rights for land tenants (See Box 3). An authorized water user typically includes the right to access and withdraw water resources. In this particular case, temporary water use rights will be attached to land use rights and enrolled in the land Registry or ledger.
* Conclusions about recommended criterions for setting water charges for Suriname

Box 3. Recommended two-step implementation of *Water rights for Surinam's irrigators*

|  |
| --- |
| Many countries do not have formal water rights. In 2003, Laos, Vietnam, Indonesia, among others, did not have formal water rights for rice paddy growers[[8]](#footnote-8). In LAC, except for Chile, Mexico, Peru and Brazil, the rest of the countries do not have firm, formal and enforceable water rights for irrigation.  A prerequisite to establish water use charges, or irrigation fees, of one formula or another, is to have a registry of users, based on which adequate revenue collection mechanisms can be established. Linking water use rights to irrigated land is intended to be a previous step toward establishing a water rights system based on customary water uses previously registered. In Suriname the Ledger is the prototype of a Registry.  In the first-step, it is proposed that temporary water rights be issued and attached to the land use rights in Suriname, as a previous step to set up formal water rights.  Water rights are initially defined as annual water use authorizations or licenses. This temporary water right in the form of authorization should be granted to the actual land user either attached to a land title, land registry form or land lease contract.  The water right will describe the state of leveling of the land to which it is appurtenant. A GIS will register the lands of each grower, the roads, embankments, and other structural elements which are relevant.  All growers will be given a period to register their water use right in the land registry. After the end of the enrolling period, non-registered irrigators will not be allowed to flood their fields.  WBs elected representatives will have access to the ledger. It is proposed that formal communications to growers be the responsibiliy of OW MCP, including notifications to non-compliant growers.  In the second-step, in two years, land use rights and water rights will be formally separated, and enrolled in separated registries. Water rights will be attached to the land, but will be defined quantitative terms. |

***Specific deliverables of Tranche 2***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1. Coordination | 2. Financial Framework | 3. Techn/Econ Efficiency | 4. Institutional strengthening | 5. Maintenance | 6. Investments infrastructure |
| **4 Ministries** | First-year IDCUS’ evaluation | Approves financial scheme |  |  |  | M Reg Dev  Min Public Works  LVV |
| **IDCUS** | Review performance and approves 2nd year budget | Approves | Agrees on performance indicators  Approves of WBs and OW MCP | | Approves |
| **OW MCP** | Works with WBs  (Coordination meetings) | Receive payment based on performance | Accounting system developed  Operation of irrig and drainige | Supports WBs  Completes capacity building | 1st-year execution | 1st-year execution |
| **WBs (all in Suriname)** | Communication Plan with farmers | WBs receive subsidies  based on performance | WBs' ledger fully operative | Capacity building session  Meetings  functioning | First-year maintenance plan, polder level | Small investments  (leveling program) |
| **LVV** | Other ongoing reforms (extension, trade, R&D, Rice Coordination unit, plant health, financing) | | | | | |

### Tranche 3

Tranche 3 has a strong component evaluation work, and will allow for taking steps further towards deeper policy changes implementation and consolidation.

**Task 3.1**

***IDCUS* will,** together with OW MCP, issue an interim report evaluating progress on measures proposed in Tranches 1 and 2. This report will include a section evaluating the performance and efficacy of IDCUS itself, which will presented before the Parliament.

**Task 3.2**

Taking into account Task 3.1, ***IDCUS* will,** together with OW MCP and in consultation with other stakeholders, academics and government branches, will issue version 2 of *Suriname 2020 Water Vision: Irrigation and drainage v2.* This new version might go beyond irrigation and drainage and include other long term objectives related to integrated water management in the country.

**Task 3.3**

***IDCUS* will,** in consensus with OW MCP, submit to the Government Cabinet a proposal for water charges and water use rights in irrigation, in which:

* Water use rights are formally defined and eventually enrolled in a specific registry.
* Detailed water supply cost estimates are taken into account
* The leveling state of the farmers and the differences in water needs depending the plots' leveling are taken into account. It is proposed that farmers pay a flat rate per hectare, corrected with the leveling state of the lands.
* A ramp to increase from 0 to 100% of cost recovery of all estimated variable supply costs in 5 years is considered (See OW MCP's operational Table 6).

**Table 7. Suggested per hectare charges for levelled and non-levelled polders**

|  |  |  |  |
| --- | --- | --- | --- |
| Base 50 SRD/ha | | Non-levelled Polders  (SRD/ha) | Levelled Polders  (SRD/ha) |
| Year 1 | 20% | 10 | 5 |
| Year 2 | 40% | 20 | 10 |
| Year 3 | 60% | 30 | 15 |
| Year 4 | 80% | 40 | 20 |
| Year 5 | 100% | 50 | 25 |

The Government Cabinet needs to approve the proposal and submit it to the Parliament for approval in the form of a Republic Decreet.

**Task 3.4**

**OW MCP**, in coordination with WBs, puts the operations management programme of irrigation into practice.

***Specific deliverables of Tranche 3***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1. Coordination | 2. Financial Framework | 3. Techn/Econ Efficiency | 4. Institutional strengthening | 5. Maintenance | 6. Investments infrastructure |
| **4 Ministries** | Second -year evaluation | Approves financial scheme |  |  |  | M Reg Dev  Min Public Works  LVV |
| **IDCUS** | Review performance and approves 3rd year budget |  | Agrees on performance indicators  Approves of WBs and OW MCP  Reviews Performance of OW MCP and WBs | | Approves  Reviews Performance |
| **OW MCP** | Works with WBs  (Coordination meetings) | Receive payment based on performance | Review Performance | Supports WBs  Completes Capacity Building | 2nd-year  execution  Reviews WBs performance | 2nd year-plan |
| **WBs (all in Suriname)** | Each WB submit a report to OW MCP about  Program's execution | WBs receive subsidies  Based on performance |  | Continues with regular meetings and communication plans | 2n-year maintenance plan | Small investments  (leveling program) |
| **LVV** | Evaluates crops' and land productivity (yields, $) | | | | | |

**4. INFORMATION COLLECTED AND SOURCES**

The following table presents the information already collected. Most of these documents are in Dutch and some of the relevant information needs to be translated.

|  |  |  |
| --- | --- | --- |
| N | Information collected | Author / collected from |
| 1 | 2005 WBs law | Staatsblad (Gazette) |
| 2 | 2006 WBs decrees (6 decrees approved) | Staatsblad (Gazette) |
| 3 | 2007 OW MCP decree | Staatsblad (Gazette) |
| 4 | Status WBs Nickerie (rehabilitation phase) | Ministry of Agriculture |
| 5 | Master Plan for the supply and distribution of irrigation water in Nickerie | OW MCP |
| 6 | MCP Multiannual Strategic Program 2010-2014 | OW MCP |
| 7 | MCP Annual Plan 2013 | OW MCP |
| 8 | Manual of WBs institutional support | National Rice Program |
| 9 | Costs and benefits of support systems in the rice sector of Suriname | National Rice Program |
| 10 | Planning drainage & irrigation for developing the rice sector in Suriname | National Rice Program |
| 11 | Rehabilitation and completion of the irrigation and drainage infrastructure in Nickerie | CARIFORUM – EU Program |
| 12 | Organization and management aspects of the rice industry in Suriname | CARIFORUM – EU Program |
| 13 | 1st National Communication under the UNFCC | NEMOS – Republic of Suriname |
| 14 | FAO data: crop production, area, yield, area equipped for irrigation, export, prices | FAOSTAT & AQUASTAT |
| 15 | Information about 'Overview of water boards in Suriname' (see Table 4); 'Roles of different Ministries' (see Box 1); OW MCP Costs (see Table 6) | LVV  May 8, 2013 |

**AGENDA 14 – 23 FEBRUARY 2013**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DAY** | **TIME** | **ORGANIZATION** | **CONTACT** | **DETAILS** |
| 14-02 | 11h | Rice Coordination Unit | Names – 2 people present |  |
| 15h | District Commissioner Coronie  (Visit to rice production area and  cherry/orange orchard) | DC  Agriculture advisor to the DC: Ms. André  Head Agric. Depart. | [a.graanoogst@hotmail.com](mailto:a.graanoogst@hotmail.com) |
| 15-02 | 8h | Ministry of Agriculture – Nickerie | Regional Coordinator LVV for Coronie & Nickerie |  |
| 9.15h | ADRON | Jerry R. Tjoe Awie – Plant breeder  Crop Management  Robert J. Elmont – Post-Harvest Consultant | [jerrytjoeawie@aim.com](mailto:jerrytjoeawie@aim.com)  [ngajadin@yahoo.com](mailto:ngajadin@yahoo.com)  [rjelmont@gmail.com](mailto:rjelmont@gmail.com) |
| 10h | SML | Same as ADRON (Jerry R. & Robert J. Elmont) |
| 11h | SPBA – Farmer’s organization | 7 farmers present |  |
| 16-02 | Working on the report – no meetings | | | |
| 17-02 | 10h | IDB team meeting | | |
| 18-02 | Working on the report & IDB team meeting | | | |
| 19-02 | 9h | Ministry of Agriculture | PS Agriculture (Mr. Brainburg) &Technical staff |  |
| 12h | Rural Development consultant | Ing. Arthur Zalmijn MSc. | [arthurzalmijn778@yahoo.com](mailto:arthurzalmijn778@yahoo.com) |
| 20-02 | 8h | Ministry of Agriculture | Ir. Souresh Algoe (Deputy Director of Agriculture)  Sagnanan Ganpat (Irrigation specialist) | [salgoe1312@yahoo.es](mailto:salgoe1312@yahoo.es) |
| 14h | IDB + Agriculture advisor to the President | Mr. Power |  |
| 21-02 | 9h | OW MCP | OW MCP Board Chair – Mr. Hindori | [mhindori@sr.net](mailto:mhindori@sr.net) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DAY** | **TIME** | **ORGANIZATION** | **CONTACT** | **DETAILS** |
| 21-02 | 9h | Ministry of Regional Development | PS Regional Development  Mr. Richenel Small |  |
| 11h | CELOS | Vice-Chairman (Deputy Director): |  |
| 14h | IDB team meeting | | |
| 19h | Landbouw Coöperatie Kwata & Omstreken | Chairman: Bajnath D. | [landbouwcoopkwata@yahoo.com](mailto:landbouwcoopkwata@yahoo.com) |
| 22-02 | 8.30h | Ministry of Public Works | Metereological service: Mr. Armand Ahmat Ali | [armand\_amat@yahoo.com](mailto:armand_amat@yahoo.com) |
| 23-02 | Working on the report – no meetings (departure in the evening) | | | |

INTERVIEWS HELD during April and May (Teleconference)

* Mr. Moediu Tirtotaroeno, Commissioned by the Ministry of Natural Works to launch "Government to receive roadmap on integrated water management".
* Mr. Manojd Hindori, Chairman of OW MCP
* Mr. Richenel Small, Director of OW MCP
* Mr. Otto Ferf Jentink, Project Director of Waternet EU Project "Capacity Building for Integrated Water Management in Nickerie, Suriname"

1. 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-1)
2. (a) Support to the Competitiveness of the Rice Sector in the Caribbean, Project 9ACO ROR006 "Organization and Management Aspects of the Rice Industry in Suriname" Ir. I.J. Poerschke. Paramaribo, 2005. (b) "Costs and Benefits of Support Systems in the Rice Sector of Surinname". National RijstPrograma. Project. 9ACP RPR 006. André Graanoogst, 2007. (c) "Planning and Drainage for Developing the Rice Sector in Suriname". National RijstPrograma. Project. 9ACP RPR 006. Frédéric Mertens, 2008. (d). 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-2)
3. The EU ACP Water Facility programme is aimed at meeting the Millennium Development Goals for water and improving water governance and management of water resources. World Waternet will execute this project in collaboration with the Surinaamse Waterleiding Maatschappij (SWM), Vitens Evides International (VEI), the Anton de Kom University Surinam (AdeKUS), the Stichting Fonds Ontwikkeling Binnenland (SFOB, Fund for the Development of the Interior) and the Stichting Bureau voor de Dienstverlening aan NGO's (Bureau NGO, a bureau working with bilateral and multilateral donors to administer funds to NGOs). The project will focus on improving the capacity development of SWM in order to increase the production and distribution of drinking water in the coastal plain of Surinam. [↑](#footnote-ref-3)
4. Upon meeting with the Head of the Hydraulics Resource Division of the Ministry of Public Works, with 40 staff members, it seemed clear that redundant officers could be reassigned to this Secretariat. [↑](#footnote-ref-4)
5. State Decree of 26 April 2006 establishing the water Samillkreekpolder and adoption of Management Regulations (Regulations Governing Water Sawmillkreekpolder) [↑](#footnote-ref-5)
6. (a) Support to the Competitiveness of the Rice Sector in the Caribbean, Project 9ACO ROR006 "Organization and Management Aspects of the Rice Industry in Suriname" Ir. I.J. Poerschke. Paramaribo, 2005. (b) "Costs and Benefits of Support Systems in the Rice Sector of Surinname". National RijstPrograma. Project. 9ACP RPR 006. André Graanoogst, 2007. (c) "Planning and Drainage for Developing the Rice Sector in Suriname". National RijstPrograma. Project. 9ACP RPR 006. Frédéric Mertens, 2008. (d). 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-6)
7. For instance, the Master Plan for the Supply and Distribution of Irrigation Water for Agricultural Production in the Nickerie District (2009). [↑](#footnote-ref-7)
8. Bruns, B.R., C. Ringler and R. Meinzen-Dick (Eds.)*.* (2006) *Water Rights Reform: Lessons for Institutional Design*. International Food Policy Research Institute. Washington, D.C, [↑](#footnote-ref-8)