THE GOVERNEMENT OF THE REPUBLIC OF MALAWI
MINISTRY OF AGRICULTURE, IRRIGATION AND WATER DEVELOPMENT

# Public Private Partnership Feasibility for the Shire Valley Irrigation Project (SVIP)

## PPP FEASIBILITY REPORT FOR THE SVIP

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# PUBLIC PRIVATE PARTNERSHIP FEASIBILITY STUDY FOR THE SHIRE VALLEY IRRIGATION PROJECT

## DRAFT FEASIBILITY REPORT

## TABLE OF CONTENTS

# LIST OF TABLE AND FIGURE

## FIGURES



## TABLES

# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADPS | Agricultural Development Planning Strategy |
| AfDB | African Development Bank |
| ARET | Agricultural Research and Extension Trust |
| CAPEX | Capital Expenditure |
| EU | European Union |
| EPC | Engineering, procurement and construction |
| FIRR | Financial Internal Rate of Return |
| GoM | Government of Malawi |
| ISC | Irrigation Service Charge |
| KPI | Key Performance Indicators |
| KSCGS | Kasinthula Sugar Cane Growers Scheme |
| MCL | Modern Concession Low |
| MoAIWDI | Ministry of Agriculture, Irrigation and Water Development |
| MK | Malawi Kwacha |
| M.MK | Millions of Malawi Kwacha |
| Mm3 | Millions of cubic meters |
| MoLHUD | Ministry of Lands, Housing and Urban Development |
| MW | Megawatt |
| NPV | Net Present Value |
| O&M | Operation and Maintenance |
| OPEX | Operational Expenditure |
| PPPC | Public Private Partnership Commission |
| PPP | Public Private Partnership |
| SVCGT | Shire Valley Cane Growers Trust |
| SVIP | Shire Valley Irrigation Project |
| SVISU | Shire Valley Irrigation Service Unit |
| SPV | Special Purpose Vehicle |
| TFS | Technical Feasibility Study |
| ToRs | Terms of Reference |
| WB | World Bank |
| WPA | Water Purchase Agreement |
| WSP | Water Service Provider |

# PREAMBLE

The Shire Valley Irrigation Project (SVIP) has been pursued for many years by the Government of Malawi to improve agricultural production and then to increase agricultural growth and reduce rural poverty in the Lower Shire Valley. Promoting initially small-scale farming for food security, the project has evolved to consider the development of commercial agriculture as well as food security reinforcement into a win-win partnership with the private sector. The SVIP project purpose is to establish smallholders farming organisations into profitable value chains and establishing professional irrigation services by developing about 42,500ha irrigated by gravity in the Lower Shire Valley.

The technical project has been studied by several consultants (Sogreah-BCEOM; CODA; AWF) and more recently a pre-feasibility study for a Public Private Partnership model adapted to the SVIP context has been done (BRLi, 2011). A joint mission of AfDB and World Bank in 2011 defined the additional technical, agricultural, environmental and financial studies needed to implement the SVIP project under a PPP scheme.

The present study named Public Private Partnership feasibility study for the Shire Valley Irrigation Project aims to advise the Government of Malawi (MoAIWD/PPP Commission) on how to implement a **viable PPP model for financially sustainable irrigation development and management** in the context of the **Shire Valley Irrigation Project (SVIP).**

The assignment will be performed in 4 phases. The four phases and their associated timeframes are as follows (M=month when the assignment starts, followed by a number of months).

- **Phase 1: Inception/Preliminary Assessment**
  - 1A: Kick-off and preparatory work
  - 1B: Preliminary Assessment
- **Phase 2: PPP feasibility study**
- **Phase 3: Outreach and market test**
- **Phase 4: Completion phase**

The present draft PPP feasibility study report is the main output of the phase 2 of the assignment. The objectives of this report are to:

- **Study the institutional options to organize a contracting authority**
- **Realize the financing model to assess the feasibility of the various PPP arrangement**
- **Assess various option of the water service charge in order to discuss the WPA**
- **Realize a value for money analysis**
- **Presentation of the next stages of phase 2: negotiation process, drafts documents to prepare**

It is important to notice that the financial model will be updated in the next stage considering (i) the observations of the Client regarding the hypothesis retained to establish the financial model and (ii) the type of contract to be selected; (iii) the data from the feasibility study of TFS (especially regarding the cost of the project); (iv) the data from the AGDPS study regarding gross margin of the crops selected.

# 1. INTRODUCTION

This report aims to assess the feasibility of a PPP arrangement to manage the SVIP. It is divided into 6 main sections organised as follows. The first section deals with the review of the outputs of the other SVIP components that are (i) the technical feasibility study and (ii) the agricultural strategy. The review of the technical options was a crucial issue, as those options define the phasing of the project, the CAPEX and the OPEX linked to the development of the infrastructures. From the technical options assessment, the financial model allows the calculation of the potential participation of the private sector and the resulting cost for the public sector, the water price that should be set up in order to guarantee the sustainability of the water service. The agriculture strategy, as it has, provides information about the on field investment costs according to the irrigation system required, the volume of water that can be sold by the scheme operator, the ability of the water users to pay for the service. The PPP team provides in this report, a number of recommendations as per ToRs of the assessment mentioned above. Through those recommendations the consultant alerts the task force in charge of the SVIP about the few requirements without which the project cannot be structured as a PPP.

The most important issue to be solved in order to structure a PPP to realise the infrastructure is the bankability of the project, meaning the agreement by bankers to finance its development. Unfortunately, financial environment in Malawi is unstable in regards to interest rates and exchange rates. Therefore, one of the most important tasks in structuring the PPP will be to address this instability by relying on hard currency revenues to hedge foreign loans, much cheaper than local funding.

In the second section of the assessment the consultant presents the principles of Water purchase agreements. One of the most interesting propositions in this report is to rely on such water purchase agreements in order to reduce financial risks and facilitate the funding of the project. The preliminary WPA negotiation with the various waters users of the scheme will make the project more attractive for private sector.

The third section of this report deals with the institutional arrangement and the capacity building program that could be proposed in order to guarantee the implementation and the sustainability of the PPP for SVIP. The detailed risk assessment is also a component of this part.

In the fourth section, a financial assessment is proposed based on a financial model in order to select the PPP arrangement that is going to be proposed for SVIP. This part shows that with the technical conditions proposed in the options, a concession arrangement is feasible for SVIP as well as the other PPP options that are less restrictive than the concession. This section provides the various financial dimensions of the project and assess the profitability of a PPP for the public authority and for the private sector. It also deals with the level of ISC proposed to each water users and that will have to be preliminary negotiated through the WPAs.

The last section of the report provides all the draft documents and required recommendations to carry out the tender phase and to select the private partner that will be in charge of managing the scheme.

# 2. REVIEW OF TECHNICAL OPTIONS

## 2.1 REVIEW OF INFRASTRUCTURES OPTIONS AND COST ESTIMATIONS

The annexes were not available with the TFS team's Options assessment report (version of the 25th May 2016) which was sent to the PPP team. The review of the report is only focus on the main document.

### 2.1.1 Project scope

#### Intake location

The location of the intake is advised in site A in TFS study, but more upstream, in site B in the hydraulic modelling study (2.1.4 – p2-6 – Chapter 2) – the issue will have to be discussed and the matter determined definitely.

#### Land characteristics

Most of the project area is covered by cultivated land (rainfed crops and sugarcane): 87% of phase I (39% rainfed crops) and 75% of phase II (60% rainfed crops) (Table 2.1-3 – p2-3 – Chapter 2).

The predominant land tenure is customary tenure but there are huge private leaseholds especially in phase I (48% of the land) due to the sugar estates presence. Considering customary tenure, almost all land has been allocated (p 2-84 – Chapter 2).

#### Topography

The topographic study (2.1.5 to 2.1.7 – p 2-7 to 2-20– Chapter 2) on the Feeder and Bangula canal route settled that the starting point is 144m, the end of the Feeder canal is 134.5m (p2-8), and the end of the Bangula canal should be about 95m (p 2-18). Then the average slope on the canal route (about 140 to 170km) is about 0.03%. A gentle slope for each zone of SVIP does not make the topography an issue to select suitable land.

#### Soil

The soil study is not available (no annex) but from the FAO digital soil map (Figure 2.2-1 – p 2-24 - Chapter 2), most of the soils in phase I are Eutric Fluvisols, and then Haplic Luvisols (zone I), and most of the soils in phase II are Haplic Luvisols and Eutric Vertisols in zone B; Eutric Vertisols and Eutric Fluvisols in zone C; Haplic Luvisols, Calcaric Cambisols and Eutric Fluvisols in zone D.

A geotechnic study has been done along the route of the Feeder and Bangula canal: 28 points on 153km (§ 2.3 - p2-32 and 2-33 – Chaper 2) and the permeability results of 10 samples in about 50km on the Feeder canal route are presented (Table 2.3-8 – p2.41). The permeability coefficient K varies between 0.05 and 0.3 mm/s (thus 6 samples in 10 are with permeability coefficient K < 10-4 m/s which is not very good, but not so bad). The soil profile from the samples is described as generally sandy (p 2-42 – Chapter 2).

Further study on soil should be done, 10 samples for the Feeder canal (length about 50km) is not enough, there is no permeability results for Bangula canal and there is no description of the soil ability to be used as fill on site. It is essential to know if the materials on site can be used for fill or if materials need to be transported from another site in the area. Indeed, sandy soils are not the best for compacting (water may be required, or compaction on site may be not possible). The limit value of the permeability coefficient for the site materials to be used to build the canal should be clearly settled and the soils characterized all along the canal.

Land suitability study for maize, bulrush millet, groundnut and cotton under improved traditional management (Figure 2.2-3 J.H. Venema, 1991 – p 2-30 – Chapter 2) shows that the SVIP area is suitable for cotton, millet, groundnuts but not for maize. However, this study has been done for cultivation under "improved traditional management" (rainfed?) and is from 1991. Moreover, the FAO classification from 1969 shows that an important part of zone C would not be arrable land or limited arable land and would reach 32% of the area (Figure 2.2-2 – p 2-28 – Chapter 2) – which means that an important part of zone C would be excluded from the SVIP. However, these references are old and need to be updated to conclude on land suitability and to outline the project.

Land suitability map updated for farming under irrigation and according to the cultures selected in the cropping pattern should be done. The areas where soils are not suitable should be identified, quantified and excluded from SVIP.

## Flooding

The flood map (Figure 2.5-13 - p2-71 – Chapter 2) shows that:

- Phase I is affected by the 10 year return flood in the south of zone I-1, almost all the northern part of zone I-2 and an important part of zone A. The 50 years return flood is affecting the same areas but the vulnerability of zone I-2 is much more extended.
- Phase II is generally safe from the 10 and 50 years return flood. 10 years return flood affects the northern area in zone C. Considering the 50 year period, the area extends to the south of zone B.

As a consequence, flood mitigation measures will be necessary in some areas, especially those out of the existing estates, and should be clearly identified and described: works for the bed-rivers recalibration, dikes, expanding flood areas etc. Moreover, the land available for farming into SVIP may have to be reduced in some areas: a flood map excluding the areas of SVIP which are too vulnerable should be done. The cost of such flood mitigation measures might be significant and needs to be taken into account in the investment cost of the project.

## Irrigable land

In section "Phasing of the project" (§3.5 – Table 3.2-3 – p 3-55 - Chapter 3), new land to provide compensation for Illovo estate exclusion are found in zone I-1 and zone A, then in zone B and zone C. It would be interesting to see if it is possible to include these land located in the option "Including Illovo" according to water requirements constraints (and infield irrigation efficiency improving), land vulnerability to flooding, etc. to reduce the investment cost per hectare. A more detailed map with the areas excluded and included should be done.

## Water availability

As mentioned in the comments of the Client, the water availability part is confusing (§ 3.1.2 - Chapter 3). The 80% dependable flow is not presented on a monthly basis: indeed, the availability of a yearly mean flow does not ensure the availability of water throughout the year, especially during the dry months where the water demand for irrigation is the highest and the river flow the lowest. Comparison between the data flow in the Shire River (data from Atkins, 2011) and the irrigation requirement calculated (data from TFS, 2016) shows that 80% dependable flow cannot cover the water demand most of the year (Kapichira I and II + SVIP phase I and II) and that 70% dependable flow cannot cover the water demand during the dry season (July to December) (cf. Table 2-1 below). It is important to notice that the 70% dependable flow cannot cover the water needs of Kapichira at full capacity (Kapichira I and II) from August to November.

The conclusion of the previous studies on water availability were:

- From Norplan study (Norplan, 2013-p1.3): An overall demand of 307m$^3$/s is covered for 97 months out of 240 months (40%) based on the most recent period from 1990 to 2009.
- From Atkins study (Atkins, 2011-p16): An overall demand of 320m$^3$/s is covered for 244 months out of 700 months (35%) based on the period from 1949 to 2009.

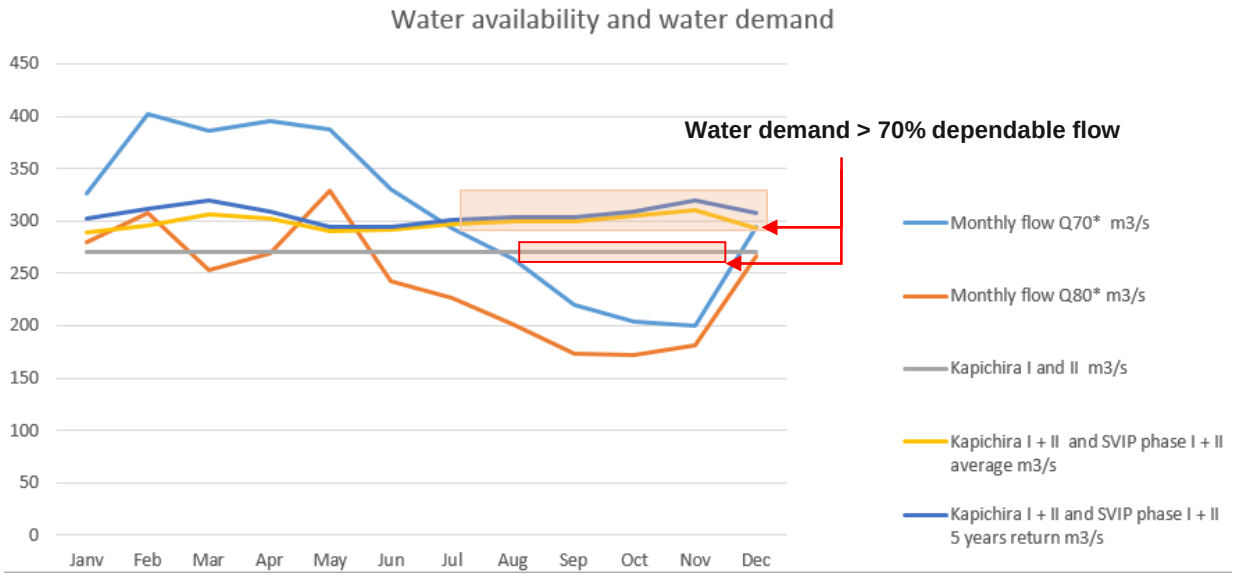
**Considering the water availability, it will be important to contract a water right for SVIP for the dry years water requirement (5 years return) to ensure the water availability during the peak season. The Government of Malawi has agreed to give priority to irrigation and it should be underlined in the report.**

*Table 2-1: Water availability and water demand*

| Month | Monthly flow Q70* | Monthly flow Q80* | SVIP phase I and II average need** | SVIP phase I and II 5 years return need** | Kapichira I and II need | Kapichira I + II and SVIP phase I + II average need | Kapichira I + II and SVIP phase I + II 5 years return need |
|---|---|---|---|---|---|---|---|
| | m$^3$/s | m$^3$/s | m$^3$/s | m$^3$/s | m$^3$/s | m$^3$/s | m$^3$/s |
| Jan. | 327 | 280 | 19.6 | 32.6 | 270 | 289.6 | 302.6 |
| Feb | 402 | 308 | 25.8 | 42.0 | 270 | 295.8 | 312.0 |
| Mar | 386 | 253 | 36.1 | 49.6 | 270 | 306.1 | 319.6 |
| Apr | 396 | 269 | 31.9 | 38.8 | 270 | 301.9 | 308.8 |
| May | 388 | 329 | 21.1 | 24.3 | 270 | 291.1 | 294.3 |
| Jun | 331 | 243 | 21.7 | 24.6 | 270 | 291.7 | 294.6 |
| Jul | 293 | 226 | 26.5 | 31.1 | 270 | 296.5 | 301.1 |
| Aug | 264 | 201 | 29.5 | 33.9 | 270 | 299.5 | 303.9 |
| Sep | 220 | 173 | 29.1 | 33.3 | 270 | 299.1 | 303.3 |
| Oct | 204 | 172 | 34.7 | 39.5 | 270 | 304.7 | 309.5 |
| Nov | 200 | 181 | 40.6 | 50.0 | 270 | 310.6 | 320.0 |
| Dec | 294 | 267 | 23.4 | 38.3 | 270 | 293.4 | 308.3 |

**** From Atkins, 2011 (Table 4.2 p14) - Monthly flow exceedance statistics for derived flows at Chikhwawa 1949 - 2009***

***** From TFS for SVIP - Chapter 5***




In chapter 6, some consideration to raise the outflow available at Kamuzu barrage is developed. However, there is no conclusion to ensure more available flow at Kapichira dam during the dry season.

### Cropping pattern

The cropping pattern selected for water requirement calculation is presented in Table 5.2-3 p 5-6 (Chapter 5). It includes 44% of sugar cane, 30% of a rotation of cotton (dry season) and beans or maize, 20% of a rotation of soya beans and dry beans or maize, and 6% of tropical fruits:

- The percentage of maize is reduced into the cropping pattern compared to the previous version, and is 30% of the winter crops. An updated map of land suitability is required to valid the cropping pattern;
- It is not clear in the report if the cropping pattern is a TFS proposition or if it is coming from the ADPS team recommendation. It is different from the options presented in chapter 2 (§2.6.6.2 – p2-87 – Chapter 2, based on the report of ADPS team), and it is different from the cropping pattern proposed in ADPS study. The cropping pattern has been updated compared to the previous version of the TFS report (version of may) but it would be good to refer directly to common work with ADPS (and the soil study data when available);

## 2.1.2 Technical options

### Main structures on the Feeder and Bangula canals

The list of the main structure is presented in Table 2.1-11 (§ 2.1.7 - p 2-18 and 2-19 - Chapter 2). There is about one main crossing structure every 9.5km on the Feeder canal, which means that some complementary structures might have to be implemented. There is no description of the kind of structure considered at this stage and the main design parameters to take into account: culvert, siphon, aqueduct, flow to evacuate through the crossing sections.

## Canal scale and optimization

A canal lined with concrete (conclusion of p3-38 – Chapter 3) would be much more expensive than an earth canal. It would be interesting to consider different options for lining the canal in order to reduce the investment cost: geomembrane liner, bentonite waterproofing membrane, concrete, masonry... Moreover, the criteria for selecting a lined canal in table 3.3-6 (§ 3.3.4 - p 3-39 – Chapter 3) is the excavation volume and the width of the canal whereas it is the permeability in Chapter 2 (Conclusion of p 2-42) and p-3-38 of Chapter 3. The need for lining the canal (Feeder canal and Bangula canal) should be discussed in depth and the main characteristic of the lining should be listed: thick, drainage under the lined canal, etc.

The schema of the cross section in table 3.3-6 (§ 3.3.4 - p 3-39 – Chapter 3) shows a cut and fill canal. However, a complete cross section of the canal (drain and service routes) is not provided.

The Strickler coefficient (K) and the side slope (m) are parameters which are not indicated in the cross section tables (p. – Chapter 3). It is not clear from which standards the ratio of tables 3.4-3 to 3.4-6 (p 3-44 and 3-45 – Chapter 3) are coming from. The Strickler coefficient is a key parameter: the section will be optimized according to its value.

The key parameters selected to design the canal section are quickly mentioned but not clearly explained:

- Width of the canal allowance (because of land availability issue; maintenance issue…);
- Maximum depth of the canal (because of maintenance issue in the case of an earth canal; because of the excavation unit rate issue; …);
- Perimeter of the canal (because of lining cost issue);
- Estimation of excavation into rock area;
- What is exactly the safety problems due to hydraulic pressure?
- Etc.

## Balance reservoirs – Surface water resources

10 sites for potential dams have been selected for water runoff catchment. The total storage capacity of the 10 reservoirs is about 30 million $m^3$ (Table 3.9-4 p 3-98 – Chapter 3) However, on the map 3-9-11 p 3-97 (Chapter 3), 3 are located completely downstream, and 3 are located quite far from the route of the canal. The conclusion of the report is that these reservoirs are not able to supply water during the dry season (p 3-102 to 3-111).

## Other considerations

Water requirement in Chapter 5 is calculated on the basis of a daily driving irrigation period of 24h whereas it is not the current practice for furrow irrigation. That means some night storage reservoirs should be implemented on the branches but it is not mentioned in the options. Moreover, the location of the night storage reservoirs is important to consider: on the branch canal (to avoid to oversize the main canal), upstream or in the middle of the branch canal (to reduce loss of head or to reduce the oversizing of the branches).

The study does not consider the option of balancing dams implemented on the main canal. These balancing dams would be filled up during the wet season through Kapichira dam to supply water during the dry season. It is an option that might be to consider – especially if water availability is a problem during the dry season for Kapichira and SVIP.

***There is no specification at all about any proposed regulation system whereas the investment cost and the conveyance efficiency will be influenced by this choice.***

### 2.1.3 Water requirement

Water requirement calculation is essential for the SVIP project because the cost of the infrastructure is depending on the design water flow and the income of the service provider will depend on the volume of the water sales.

Regarding water requirement, the comments are:

- Table 3.1-2 (p 3-3, Chapter 3) has been updated compared to the previous version of the report (version of the 31th of Marsh) for the option "With Illovo Estate" but not for the option "Without Illovo Estate". Tables 3.1-7 and 3.1-8 (p3-11 and p 3-12) have not been updated compared to the previous version of the report (the cropping pattern has changed). Then the daily water demand is different from the water demand established in Chapter 5.
- The water need (design water flow) for the option "Without Illovo" in table 3.1-2 (p3-3) and table 3.1-8 (p3-18) has been calculated by a proportional approach, that means by reducing the water need proportionally to the loss of surface without taking into account the different repartition of the cropping pattern in that case (less sugar cane and more cotton / soya beans / tropical fruits). It would be good to ensure that considering the same cropping pattern for both options with and without Illovo does not lead to an over or under estimation of the design flow by comparing the period and amount of the peak water demand for sugar cane areas and cotton / soya beans / tropical fruits areas.
- The report is confusing about effective rainfall and 80% dependable rainfall calculation: §5.2.2 p5-4 in Chapter 5 explains that effective rainfall was calculated using CROPWAT 8 based on the FAO empirical formula, but later it is told the rainfall data were computing to realize plotting probabilities and that the effective rainfall should be calculated using the "fixed percentage option" with 80% value to calculate effective rainfall (§ 5.2.3 - p5-5 - Chapter 5).

  On the other hand, the calculation for water requirements according to table 5.2-10 and 5.2-11 (p5-10 – Chapter 5) has been done by calculating ET0 for each month of each year – and then the average water requirement and the 5 years return water requirement have been ascertained.

  The method should be explained clearly in the report;

- The overall irrigation efficiency is 52% according to p 5-8 (Applied Irrigation Efficiencies – Chapter 5):
  - An application efficiency of 65% for furrow irrigation is considered for the all project (Table 5.2-7 p5-9 Chapter 5). However, almost 16,000ha of the SVIP area is already developed with sugar cane (one third of the entire project) and an important part is irrigated under pivots or draglines: the part irrigated under sprinklers should have a better application efficiency rate and it may reduce the water requirements calculation as the area concerned is not negligible (particularly for phase I);
  - Depending on the detailed design being considered in stage 2, the conveyance efficiency may have to be adapted, in particular according to the regulation system adopted;
  - There is contradiction between the irrigation efficiency rates in table 5.2-7 and the text above p5-8. What are the efficiency rates to be considered?
  - There is no explanation to the choice of the efficiency rates selected.
- Water requirements for sugar cane have been calculated on the basis of seven ratoons (p 5-6 Chapter 5) and the Kc has been defined by using FAO guidelines (§5.25 p 5-7 Chapter 5). As sugar cane is 44% of the all SVIP area (Figure 5.2-3 p 5-6 Chapter 5), it will influence deeply the design flow of the project and it would be interesting to make a comparison between the results calculated by TFS and the water demand calculated by Illovo agronomic department (on which should be based the irrigation instructions). Indeed, some of the results of TFS team regarding sugar cane water requirements should be examined more closely:
  - It seems that the water requirement $m^3$/day/ha in table 5.2-13 (p5-12 chapter 5) is the same than the one calculated for the all SVIP as presented in the report of the previous version with the initial cropping pattern (version of 31st of Marsh, table 5.2-11, p5-10, Chapter 5), whereas the table 5.2-13 is supposed to be only for sugar cane;
  - The peak demand for sugar cane is in September (table 5.2-13, p5-12, Chapter 5) whereas it is in October in the Coyne & Bellier study (commissioned by Illovo). The peak demand is also reflected in the pumped water amounts of table 5.2-12 p 5-11: the peak month is then in November;
  - The peak flow is 17$m^3$/s in September (102.1 $m^3$/day/ha) in TFS study and 13 to 14$m^3$/s in November considering the table with pumped water amounts (Table 5.2-13, p 5-12)– the difference is almost 20% and cannot be explained by rainfall data (there is almost no rain in September / October). The hypothesis of TFS is the data of water pumped are not reliable: this assumption should be checked carefully as the shape of the graph of the average amounts of water pumped per month (Table 5.2-13) looks quite realistic;
- The duty flow for the global project of SVIP (design flow for the Feeder canal) is presented in table 5.2-11 p5-10 (Chapter 5). The duty flow to consider for the design of secondary and tertiary infrastructure should be ascertained too.
- It is necessary to have water requirements for phase I and for phase II: the project must be done in two phases, and a PPP arrangement will be settled for phase I only at first stage. Moreover, as a Water Purchase Agreement (WPA) has to be elaborated for each trust, water requirement should be calculated for each zone of phase I. Indeed, the crops geographical distribution is not equivalent for each zone (most of the sugar cane fields are concentrated in phase I area, and especially in zone I-2 and I-1) and it is not possible to consider that the water requirement is depending only on the surface distribution without prior check.

## 2.1.4 Project evaluation

### Energy balance of the project

The electricity consumption of Illovo is about 10GWh per month during the peak period and 80GWh per year (p 3-13 - Chapter 3; Table 3.10-2 p 3-122 – Chapter 3). Depending on the daily pumping hours (from 12/14 to 20/22 hours per day), the installed power capacity should be between 15 to 25 MW (by considering that during the peak season the full pumping capacity is in operation). The peak is reached around September / October in the text p3-13 or in December considering the table 3.1-10 (p 3-13 - Chapter 3).

This energy consumption during the peak months (10GWh/per month) could be compared with energy loss in Kapichira production due to SVIP to get the energy balance of the project – considering that water availability is not enough to supply SVIP and Kapichira at full load especially in the dry season (cf. § above Water availability). Moreover, the TFS recommendation is to maintain the current pumping system (§3.10.2.2, p3-123 – Chapter 3) in the sugar estates to supply water during drought period (5 years return base). Anyway, including Illovo into SVIP would improve the energy balance of the project as the electricity not consumed by Illovo could be released to the national grid.

### Financial analysis (with or without Illovo)

The maintenance rate applied for the Illovo Estate supply is the same for both options of an open-canal or a pipeline (p3-14, Chapter 3) whereas it is not the same kind of infrastructure. Maintenance cost for irrigation infrastructure is usually about 1 to 2% of the investment cost for canals and about 0.3 to 1% for pipelines (Plantey and Blanc, 1998).

The release of 22.2 MW to the national grid (p3-14, Chapter 3) should be considered carefully in the case of SVIP would prevent to produce electricity at full capacity during the peak months at Kapichira (cf. § Electricity balance of the project) – especially if considering it is one of the main benefit for the GoM for including Illovo as mentioned p3-19.

The annual amount of water of 290,379,000m$^3$ on which is based the calculation of the benefit for Illovo in table 3.1-15 (p3-18, Chapter 3) is the average amount of water pumped per year according to Illovo data from the sugar year 2008/2009 to 2014/2015 (table 5.2-12 – p5-11 -pChapter 5) and it seems realistic assessment.

In table 3.1.4 (p3-7, Chapter 3), it is mentioned that the rehabilitation of the canal structure of Illovo estate will lead to considerable loss of arable land for installing secondary canal – however it is not clear why it should be and it is not included in the cost and benefit analysis for Illovo. The cost recovery from Illovo estate p3-17 does not take into account the investment required for restructuring the canals network into the estate. Though it may be difficult to estimate, it should be considered as it may be not negligible in the total investment of Illovo.

It is not mentioned in this part the recommendation of TFS that is to maintain the pumping system (§3.10.2.2 – p3-123 – Chapter 3) – and then some O&M cost would persist. The O&M cost of the catchment on the Shire River seems to be costly for Illovo due to floods and high sedimentation but it is not mentioned in the study. It might reduce significantly the advantages of keeping the current pumping system.

### Cost estimation of SVIP

It is not explained what is included in the cost estimation (§ 7.3 – p7-3 - Chapter 7) regarding the main infrastructure (Feeder canal, Branch canals, Bangula canal): service roads, drainage system, night storage reservoir, regulation structures, crossing structures on the main canal, balancing dams, etc.

There is no quantity take offs.

The cost for "land levelling" is about 6,000 USD/ha (Table 7.3-1 p 7-3 Chapter 7) and is definitely the main cost of the project (about 40% of the cost of the SVIP). This cost seems over-estimated: what is included exactly in the land levelling?

The investment cost of SVIP is 12,411USD per hectare (Table 7.3-1 p 7-3 Chapter 7), which is in the average for irrigation projects. However, this cost includes the tertiary infrastructure (except for the sugar estates), and the studies. It is also considered for a lined main canal (concrete) and there is no precision about the main structures on the canal. In that perspective, the cost might be a little bite optimistic and should be studied carefully in next stage according to quantity take offs.

## 2.2 REVIEW OF AGRICULTURAL STRATEGY AND CROPPING PATTERN (FINAL INTERIM REPORT MAY 2016)

### Proposed crops

The strategy is to develop cropping pattern for the short term, medium term and long term to enable farmers to gain experience in the production and marketing of high value crops (p 113):

- Short term (up to 3 years) – easy to grow and store crops such as maize, sorghum, beans, pigeon pea, soya beans, cotton and sugar cane;
- Medium term (3 to 5 years) – crops for export such as baby corn, butternuts, chilies;
- Long term (from 5 years) – tropical fruits.

The cropping pattern for the short term programme is presented in the report and consists in 3 options (§6.2 p 71):

- Option 1: cotton / beans (75%) and soybean / Maize (25%)
- Option 2: cotton / maize (75%) and pigeon pea / Maize (25%)
- Option 3: cotton / maize (50%) and sugar cane (50%)

Thus water requirement and ability to pay of water users can only be based on the short term period (up to 3 years).

At this stage, the proposed main crops are the following (p 70-71 and p113):

- Sugar cane: Sugar cane is the most widely grown commercial crop in the area covering about 13,000 ha. Opening more land to sugar will result in more sugar for export and ethanol for petrol blending.
- Cotton: Currently the viability of cotton in Malawi is low due to high input costs compared to other cotton producing countries that are now using Bt cotton. The recent pronouncements by government that it will allow growing of Bt cotton should make cotton viable.
- Maize: Malawi is currently experiencing food shortage challenges because of the erratic rainfall. Growing maize in the Shire Valley under irrigation will supplement the dryland maize and any excess can be exported.
- Soybean: Based on information from MITC there is growing demand for soybean locally and in the region. Soybean is used for production of oil and livestock feed. It is widely used as feed in fish farming and the demand in the fish farming industry is on the increase.
- Pigeon pea: There is great demand for pigeon peas from Asian countries.
- Dry beans: Beans is widely consumed locally and can be exported to countries in Eastern and Southern Africa.
- Chillies: Malawi is famous for its bird's eye chillies and there is export demand.
- Butternut: Currently the crop is not a popular crop in Malawi but it can be developed for the export market (Europe).

- Tropical fruits (oranges, mangoes and bananas): It is reported that from the time the valley was earmarked for irrigation development, tropical fruits were among the crops that were proposed to be grown. The fruits would lead to establishment of processing factories and export of fresh fruits.

Soil suitability for some of the proposed crops have been described (p13 and p14) but there is no map that allows to identify which of the proposed developing area can fit with the crops requirement in terms of soil. The Ag strategy team have to share with the TFS which is in charge of the soil assessment in order to sort out this issue and finalize the cropping pattern according to the results.

The marketing potential of crops has been analyzed (§4 p 41 to p 59), but some crops recommended in the medium term are missing (baby corn, butternut). A more detailed market analysis is required for some of the short term crops: dry beans, pigeon pea (general marketing potential for pulses § 4.4 p52-53).

A SWOT analysis of the potential crops would help to understand better the final choices of the ADPS team. As the team has focused on the short term crops, there is no recommendation and justification for the medium and long term crops.

## Farm models

No farm models have been proposed providing the characteristic of the farm that could potentially be developed in the area (surface recommended/cropping pattern/revenue assessment per farm model/location). Based on the future equipped area proposed by the TFS, specific farms model and crop areas have to be proposed in order to assess what will be the situation with project in terms of production (of each crops); water demand (of each zone), farm organization (surface of the plots or block).

## Farmers' organization

The various form of association and potential farming contracts have been deeply analyzed (§7.5 p 99 to 111 – even if some categories are not so clear (for example what is the difference between 7.5.1 "Farm companies" p 99 and 7.5.5 "Professional Management system" p104).

The recommendation of ADPS is to set up an Association (p 93) which will engage a professional management company (Phata Cane Growers Trust model) or form / register a company to handle the operations (Shire Valley Cane grower Trust in Kasinthula model). It is not clear if the plan is to implement associations or water user's associations. The model of the association and the project structuring through associations and farm companies should be developed more fully.

However, the recommendation is to implement a Shire Valley Irrigation Service Unit (SVISU) at the first stage of the project (during the first 5 years) with a participatory management (p 120). The SVISU would be in charge of the training of farmers, the production planning, the inputs and credit supply organization, the administrative support (accounting), and marketing (storage, marketing, transport). It is not to confused with the water service provider.

## Livestock production in the command area

According to the study the livestock is an important activity of the zone, but at this stage only the key issues are underlined (potential loss of grazing land, use of crop residues as supplementary feed, etc.). The strategy still need to be analyzed.

The ADPS also proposes to develop fish farming into the SVIP on one hectare ponds as a minimum, and by synchronizing the production cycle at the scale of the project to reach the market (p 115). The gross margin for commercial fish enterprise is presented table 3-8 p40 and is MK3.96 / ha, the minimum expected is MK0.91 / ha (regarding past experience in the Shire Valley, p39). However, there is no indication on the market potential and production scale to be provided for fish farming into SVIP. Thus fish farmers cannot be integrated as water users in a PPP model.

### Crops budget

The gross margin of the main potential crops are presented in table 3.6 p 29. However, the TFS team cropping pattern includes tropical fruits, and there is no information about such crops.

There is some contradiction between the average yield of the table 3.6 p 29 and the assessments of §2.3.2 p 15 (Analysis of potential crops):

- Sugar cane yields of Illovo range from 90 to 120 T/ha §2.3.2.2 p19 (confirmed by an average about 104 to 105 T/ha from Illovo source) but the average yield in the table is 120T/ha;
- Average yield for cotton is 4 T/ha in the table whereas p23 it is told that "with good water management yields between 2.3 and 3.0 T/ha are achievable" and that a five years national mean yield in South Africa is 3.6T/ha;
- The potential yield of soya beans in research station of Seed-Co, Pannar and Chitedze vary from 2.5 to 3.0 or 4.0 T/ha (p 20 and table 2-7 p20) – the average yield in the table reaches the potential yield (3.1 T/ha) which is not likely to occur.

### Inventory of existing farmer's groups of the area

The list of the various farmers group in the area is provided, it could have been interested to assess their plan for the future in terms of agriculture development and their willingness to join the project.

## 2.3 CONCLUSION FOR THE PPP PROJECT

**Some input data and the analysis to which it was subjected** is missing in the TFS study and should be quickly presented to outline the project:

- Soil analyses (one per km) along the Feeder canal and the Bangula canal: use of excavated materials for fill, requirement for lining the canal (completely or partly), rock estimation, etc. Indeed, the choice for lining the canal, the excavation / fill cost estimation, are depending of these data.
- Map of the land included into SVIP and excluded from SVIP considering soil suitability, floods, etc. For example, if most of zone C is not suitable to be included into the project (Figure 2.2-2 p 2-28 Chapter 2), it may have consequences on the feasibility of phase II. Land suitability for the different potential crops (detailed map) should be more deeply studied to ascertain the cropping pattern.

**The selection of the cropping pattern** is different in TFS study than in ADPS study – The cropping pattern has been updated from the previous version of the TFS and the crops are some selected in the ADPS study. The crops selected are not allocated per zone (according to soil suitability for example). At the SVIP scale, the crop mix is:

- 44% of sugar cane
- 20% of a rotation soya beans / maize
- 10% of a rotation cotton / maize
- 20% of a rotation cotton / dry beans
- 6% of tropical fruits

Then the PPP model is built considering that the 44% of sugar cane is allocated into the existing sugar cane estates of phase I and phase II. Then the new land to be developed in each zone is considered with the same crop mix:

- 35.5% of a rotation soya beans / maize
- 18% of a rotation cotton / maize

- 35.5% of a rotation cotton / dry beans
- 11% of tropical fruits

The ability to pay of the farmers has not been developed and the gross margin for tropical fruits does not appear in the ADPS study whereas the crop is selected in the cropping pattern of TFS. On the other hand, there is some inconsistencies in the average yields chosen for the gross margin calculation and those described in the crops potential in §2.3.2 of ADPS report. Then, the calculation of the water fee (ability of the farmers to pay) will consider the gross margin of the table below where the average yield has been corrected according to § 2.3.2 of the ADPS and the tropical fruits gross margin will be arbitrarily associated with those of a rotation cotton / maize.

*Table 2-2: Estimated crops budget for the main crops proposed*

| Crop | Average Yield (kg/ha) | Average Price (MK/kg) | Estimated Income (MK) | Total Variable Costs (MK) | Gross Margin (MK/ha) |
|---|---|---|---|---|---|
| Beans (dry) | 2 000 | 700 | 1 400 000 | 476 345 | 923 655 |
| Cotton | 3 000 | 200 | 600 000 | 380 301 | 219 699 |
| Maize (irrig) | 5 000 | 160 | 800 000 | 499 954 | 300 046 |
| Soya beans | 2 500 | 185 | 462 500 | 347 138 | 115 362 |
| Sugar cane | 105 000 | 47 | 4 935 000 | 3 675 539 | 1 259 461 |

**The hypothesis for the design** (main parameters, constraints, choices) in TFS should be more clearly explained:

- Water availability (monthly 80% dependable flow at Kapichira) and priority given to irrigation;
- Hypothesis and method for the cross section definition of the Feeder and Bangula canal; cross section type of the main canal (included drain along the canal and service roads);
- Deeper technical rationale for lining the canal; kind of lining to be proposed and brief description;
- Method for water requirement calculation (through CROPWAT or internal calculation; etc.), water requirement for sugar cane and for the cropping pattern to be developed in new land; hypothesis for the definition of the irrigation efficiency rates; duty flow for the main structure, but also for the secondary structure and the tertiary structure;
- System of regulation which is considered;
- Flood protection structure to be considered if required (dikes; etc.);
- Design flow of the main crossing structures on the main canal, head loss due to the main siphon for Mwanza river crossing (3.6km) and feasibility of such a structure.

The PPP model has been based on the average water requirement calculated in TFS report (Chapter 5). As a complement of the water requirement of SVIP available in the report (Table 5.2-11, p 5-10, Chapter 5), the TFS team has provided the data of the monthly water requirement for sugar cane for the 5 years return. The PPP team has manipulated the data to get the average water requirement for sugar cane and for the updated cropping pattern developed in new land as presented in the table below:

*Table 2-3: Estimated water requirement for phase 1*

| Zone of phase 1 | land development | Cropping pattern | Surface (ha) | Irrigation efficiency TFS (conveyance x distribution x field application) | m3 per year TFS 5 year requirement | m3 per year TFS av. (2.33 year requirement) |
|---|---|---|---|---|---|---|
| Zone I-1 | Kasinthula | Sugar cane | 1426 | 52.1% | 37 507 245 | 30 561 933 |
| Zone I-1 | Phata | Sugar cane | 296 | 52.1% | 7 769 168 | 6 330 529 |
| Zone I-1 | Sande Ranch | Sugar cane | 454 | 52.1% | 11 916 226 | 9 709 664 |
| Zone I-1 | New land | cotton - soya beans - trop fruits / dry beans - maize - trop fruit | 5020 | 52.1% | 138 198 215 | 114 386 084 |
| Zone I-2 | Illovo - Nchalo | Sugar cane | 9995 | 52.1% | 262 340 763 | 213 762 474 |
| Zone A | New land | cotton - soya beans - trop fruits / dry beans - maize - trop fruit | 4214 | 52.1% | 116 009 417 | 96 020 509 |
| **Total** | | | **21 405** | | **573 741 034** | **470 771 193** |

**The investment cost estimation** (Chapter 7) of the TFS report should outline more precisely what is included for the main infrastructure (crossing structures; drain; flood mitigation measures, etc.). The cost for land levelling appear to be very high (40% of the total price; 6,642 USD per ha) and should be more detailed. Moreover - on one hand, the price units (labour, materials, and machinery) applied for the project costing are presented and very detailed, but on the other hand there is no quantity take off. As a conclusion, even if the total investment cost per hectare is in the normal range for irrigation project, it might be that the main infrastructure cost is under-estimated. It is very important that the main infrastructure cost would be checked carefully as the primary and secondary cost would be at the expense of the project whereas the tertiary network and land levelling cost could be shifted to the beneficiaries (farm companies and farmer's associations).

The branch canals cost is a global cost, and without other information, the break down that is required to allocate the infrastructure cost for each zone will be done proportionally to the length of each branch.

In the cost and benefit analysis, a rate of 1.5% of the investment is applied for operation and maintenance cost estimation and it is what will be done in the PPP model. However, that would mean that operation and maintenance cost of the lined canal option is more important than for the earth canal option (as the investment for a lined canal is costlier).

**The model for structuring farmers' associations and farm companies** is Kasinthula or Phata model at medium/long term. However, on first stage, ADPS envisions a period of 5 years for implantation and consolidation of the farmers' associations, under the responsibility of a Shire Valley Irrigation Service Unit. The model for structuring farmers' associations should be further developed with farm models and contracting propositions.

**As a conclusion, the PPP model is based on the data available with the remained uncertainties – as described above – and will have to be updated according to the progress of the studies (TFS and ADPS).**

# 3. PRINCIPLE OF WATER PURCHASE AGREEMENT

In the process of defining and designing the Shire Valley Irrigation Project (SVIP) PPP, the PPP team proposed water purchase agreements (WPA) in order to integrate the irrigation of ILLOVO estates and other trusts in the project. This section presents the rational for this solution, the structure of the agreement, the negotiation procedure considered, the term sheets of the agreement and the ISC to be proposed in the negotiation with ILLOVO states and other trusts.

## 3.1 WHY A WPA?

During the preparation of the project, the question of integrating ILLOVO estates in the area to be irrigated has been raised repeatedly. Many arguments for and against the inclusion of these estates in the project have been exchanged between the technical teams, the representative of the donors and the government. The arguments for avoiding the inclusion are:

- Is it acceptable to subsidize a multinational Company in a developing country?
- The economic return to the inclusion of these estates is limited. They are already irrigated and therefore will not contribute to the economy through increased production.
- The project is mainly justified through poverty alleviation. Including a large estate will not contribute to this goal.

The arguments against the inclusion can be summarized as a difficulty for the government to justify a big investment and the associated subsidy if the main beneficiary is a multinational. The economic argument on the reduced economic return concerns essentially the donors.

However, excluding ILLOVO estates has a cost. It will increase the cost of the project per hectare because the feeder canal will be extended in order to bypass ILLOVO estates and the resulting project will irrigate a smaller area with a higher total cost therefore increase the unit cost per hectare. Excluding ILLOVO estates will increase the risks of the PPP project. Instead of delivering water to a large estate with a high credit rating, the private partner will distribute water to riskier and less creditworthy customers. The demand and payment risks are increased by excluding ILLOVO. This will increase the risk premium charged by the private partner. The financing of the project will also be more difficult if ILLOVO is excluded. This Company is exporting more than half of its production and therefore realizing half of its revenues in hard currency. If it accepts to pay its irrigation service charges in dollars instead of local currency, it will permit to borrow money in dollars, at a much lower interest rate with less risks.

Regarding the question of the subsidy, and its poor justification to a multinational, it is possible to exclude ILLOVO partially or totally by discriminating its irrigation service charge. Instead of having one irrigation service charge for all the customers, it is possible to contract separately with this company and the other customers. Therefore, it is possible to obtain the benefits of including ILLOVO in the project without having to justify a subsidy to the company.

A water purchase agreement is the perfect solution to this problem. It could present to ILLOVO a set of conditions in its participation to the project. These conditions should cover the volume of water required, the price to be paid, the currency to be used, the duration of the agreement, the conditions to terminate it, etc.

A WPA is essentially a long-term commitment to buy at a specified price water from the enterprise in charge of realizing the network infrastructure. It is usually negotiated prior to the realization of the infrastructure, securing demand for water prior to financial commitment. When the credit of the counterpart is good, a WPA can be used to secure financing for realizing the network infrastructure. Usually, this agreement binds a big customer and justifies developing dedicated infrastructure in order to serve him.

This is the situation of ILLOVO. In order to irrigate its estates, the project will need dedicated infrastructure, either a canal or pipes from the feeder canal to serve exclusively ILLOVO. This conveyance infrastructure could be also used by local farmers of the area for irrigation, but this use will be marginal compared to the water consumption of Illovo.

Therefore, we can consider a WPA for solving the dilemma of including ILLOVO in the project. If accepted, it will raise the financial returns to farmers by decreasing unitary cost per hectare and the bankability of the project.

## 3.2 THE STRUCTURE OF THE WPA

The structure of the WPA will be detailed in the next section on the term sheet and in the annex presenting a provisional wording of the WPA. This section will cover the main features of this contractual arrangement. It will serve to explain how it can be used in order to finance the SVIP.

### 3.2.1 The parties to the WPA

As has been stated before, a WPA is a long term contract to deliver water to ILLOVO and other water users organized into trusts, to realize the dedicated infrastructure needed to fulfil this obligation and to define precisely the conditions to be respected by the parties. The first party is obviously ILLOVO and other existing trusts. The second one could be either the private partner of the PPP or the government of Malawi. In the second case, the government will enter the agreement to realize the dedicated infrastructure and to deliver the agreed amount of water, either through a PPP or directly if it decides so. In the first case, the WPA will be a part of the PPP contractual arrangement and the private partner will be obliged by it. In the second case, both parties, ILLOVO/other existing trust and the government, will be obligated by the WPA.

### 3.2.2 The technical specifications

We have to consider two sets of technical specifications. The first will cover the construction of the dedicated infrastructure and its operation and maintenance. The second will cover the delivery of water, in terms of quality and quantity.

The infrastructure assets should be defined by both parties. ILLOVO should be able to select whether the design should be based on a canal or on pipes. The trade-off between costs and pressure is better handled by ILLOVO. A canal is less costly but at the cost of head losses that would prevent using the pressure to operate sprinklers or pivots. Pipes reduce head losses but require a higher initial investment.

Obviously, the choice would belong to ILLOVO because it is the end user of the water supplied and will pay for the internal distribution network that could be pipes or canal based. That means that the technical specification for the infrastructure should be agreed on between the ILLOVO and the other party of the WPA.

Irrigation water is characterized by its turbidity, its acidity, and availability. Therefore, the WPA should define in details the quality of the water that is to be delivered and the adjustments in prices according to the quality. The WPA should define precisely the level of silt acceptable and the adjustment in payment terms if this level is not respected. The same with the acidity.

Usually, the private partner or the government are not in position to guarantee a level of supply, essentially because the source of the water fluctuates seasonally and year-on-year. To cope with this variability, WPA makes a difference between the capacity constructed and the amount of water effectively delivered. The private partner is paid for the capacity installed and for the water delivered differently. Usually, the capacity term of the payment covers the expenses incurred by the Company for the infrastructure, including its financing and is not indexed. The payment for the water is based on the variable costs for providing it (operations and maintenance costs). To make sure that the Company doesn't divert the flow to other customers, she will have to respect a strict and definite share of the flow at the head of the feeder canal to be allocated to ILLOVO.

In order to enforce this contractual arrangement, a measurement system has to be installed and approved by both parties. At minimum, it should provide them with reliable measures of the flow division and the amount of water derived to ILLOVO. Turbidity could be dealt with in specifying the measures to reduce it in the design or by agreeing on a sampling procedure and laboratory measurement. Usually, the measurement system is agreed on prior to the construction and its precision tested regularly in a commonly agreed manner.

### 3.2.3 The pricing and payment system

The pricing system used usually in WPA is made of two parts: (i) the payment for the capacity set aside or built specifically for the customer, and (ii) the payment for the water effectively supplied. The payments are usually secured by security bonds. They can be made on a monthly basis or any terms that agree the parties to the WPA.

In the monthly bill, the first part will be devoted to the capacity. It is usually fixed. The second part will cover the water effectively consumed, as measured by the meters agreed on in the WPA technical annex on measurement.

The first part will be calculated to cover the payment of the infrastructure dedicated. That means that it will include all the capital and interests to be paid back to the banks and the dividends that cover the equity financing of the infrastructure. As all these elements are known prior to the construction in the case of an EPC contract (the preferred contractual arrangement for constructing the infrastructure in project finance), there is no adjustment for this fixed part. The EPC contract will bind the general contractor for a fixed amount. It will be organized to pass any overrun cost to the construction Company.

The variable part will cover the operation and maintenance costs. It will be indexed to adjust to inflation in wages and equipment.

## 3.3 THE TERM SHEET OF THE WPA

This section will be devoted to present the main points to be discussed and negotiated with ILLOVO. The term sheet will then be translated in a formal contractual arrangement, similar to the one presented in annex 1. It will not cover all the points that are usually discussed in detail. It is up to the lawyers to complete the contractual arrangement, once the main points are agreed on by the parties.

In the following, we will assume that the WPA is entered between ILLOVO referred as the Client and the private partner in the PPP referred as the Company. The WPA is made between ILLOVO and the Company whereas (A) the Company plans to design, finance, construct, operate and maintain a feeder canal and a dedicated connection (either pipes or canal) in the Shire Valley Irrigation Project and (B) the Company wishes to sell to Client and Client wishes to purchase from the Company the water pursuant to the terms and conditions set forth herein.

## The object of the contract

This article with state that the WPA is a contract to sell and purchase irrigation water.

## Term

This article will deal with the initial term of the agreement stating the date of beginning of operations and duration of the agreement. It will define the renewal term.

## Pre-operation period

Will deal with permits and licenses, submissions by the Company, operating procedures, inspection, access to site, general covenants in respect of the infrastructure to be constructed.

## Representations and warranties of the Company

Will deal with all the legal powers of the Company and its representatives in entering into water purchase agreement with the Client and that the Company is in position to execute, deliver and perform in accordance with the agreement dispositions.

## Operation and maintenance of the infrastructure

This article will detail the minimum functional specifications in the delivery of the water. It will deal with the operations and maintenance of the irrigation infrastructure to be constructed under the agreement. Usually it contains provisions on the cessation of operation or abandonment by the Company, the employment of qualified personnel, inspections and records, periodic reports.

## Interconnection

This article will deal with the interconnection between the Company infrastructure and the Client network for distributing irrigation water inside its estates. The responsibilities of the Client and the Company in the regards to a proper functioning of the interconnection are specified. The testing of the facilities is defined.

## Metering

This article will define who shall own, procure, operate and maintain the metering system. It will define the testing and inspection of the system components. It will deal with repairs and replacement of meters.

## Compensation, payment and billing

The most important article of the WPA. It will cover:

- capacity payment, payment for financing and realizing the infrastructure;
- volume of water delivered payment;
- liquidated damages due to delays in commissioning, shortfalls in commissioned capacity, water delivery shortfalls;
- adjustment (indexation of the payments);
- security to be put in place during the construction period and security for the operations;
- payment of liquidated damages;

- payment and billing;
- letter of credit;

This article will set prices for capacity and the actual delivery of water. It will define the damages to be paid to the Client by the Company in case of delays or in the case of underperformance in the operation.

All the payments are secured. During the construction and the operation, the Company will provide security to cover for underperformance and delays in construction. The Client will provide letter of credit to guarantee payments to the Company.

These guarantees are essential in order to finance the construction of the dedicated infrastructure. These are pre-requisites for the lenders.

## Testing and capacity rating

This article will deal with the commissioning of the dedicated infrastructure to make sure that it can provide the flow agreed on.

## Insurance

This article will specify the insurance coverage required from the Company. It will define the endorsements agreed on and the use of proceeds of all insurance. It will provide the Client with the ability to verify that the certificates of insurance are of available and paid for.

## Indemnification and liability

This article will define the indemnities due by the Company or by the Client to the other party.

## Force majeure

This article defines the events or circumstances beyond the reasonable control of a party which materially and adversely affects the performance of that party of its obligations or the enjoyment by that. Basically, it deals with the events that exonerate a party from its obligations and the remedies and consequences of this event.

## Taxes

This article defines the obligations of the Company in regards to tax payments.

## Defaults and termination

A very standard component of any contract, this article will define the Company events of default, the Client events of default, the notice and cure to such event and the rights and remedies upon an event of default.

It will provide the Client and option to purchase the assets of the Company dedicated to the water purchase agreement and the obligations upon termination of the parties.

## Resolution of disputes

This article organizes the resolution of disputes. It begins by mutual discussions, then referral to an expert before arbitration.

It states that during the pendency of any dispute, the Company shall continue to perform its obligation to deliver water and utility shall continue to pay all amounts due in accordance with the article on compensation and payment.

### Assignment

This article organizes the right to assign (transfer of rights and obligations under this agreement) of the Client and the Company.

### Notices

This article organizes the communications between the Client and the Company.

### Miscellaneous provisions

This article covers variations in writing, the entirety of the agreement, confidentiality et cetera.

## 3.4 THE ROLE OF THE GOVERNMENT IN THE WPA

As has been presented, the water purchase agreement is essentially signed between the private operator and the water customer. This will create some uncertainty on the property of the infrastructure object of the agreement at the end of the concession.

Regarding Illovo canal (or Illovo pipe), the infrastructure will normally belong to ILLOVO. This shouldn't be a problem as far as its value is in providing water to ILLOVO (the infrastructure has no value without any water right). In the case where the government decides not to renew the concession agreement with the private operator, it can renew the water service agreement with Illovo to pay for operation and maintenance of the infrastructure and delivery of water.

For the other WPA considered in this project, the level of support by the government is higher and therefore allow that the property of the infrastructure is kept in its hands throughout and after the expiry of the WPA.

# 4. INSTITUTIONAL OPTIONS TO ORGANISE THE CONTRACTING AUTHORITY

The preliminary report assessment shows that all type of PPP could be implemented for SVIP. However, until now no decision has been taken by the government regarding the kind of PPP arrangement it is willing to set up. In this section it is then proposed to structure the PPP as a concessional arrangement (even if the other forms of PPP are not excluded of the financial assessment), where the private sector will be in charge to operate and maintain the scheme and to participate to the funding – according to the recommendations of the preliminary assessment report. The recommendations of the Consultant were, if the options of (i) cash crops development (sugar cane and cotton) and (ii) farmers organisation into trust were confirmed, to go deeper in the analysis of the concession. A concession would reduce the cost for the public sector and it would guarantee a sustainable long terms management of the scheme.

The level of participation will be defined in the section 5 of this report according to the financial assessment.

The synthesis of the different PPP options as done in the preliminary assessment report are reminded below:

*Table 4-1: PPP options and risk assumed by the private operator*

| SVIP phase I | Pros | Cons | Main risk assumed by private operator |
|---|---|---|---|
| **Management contract** | Short time contract that can be used to obtain more relevant data and to prepare the next stage (lease/affermage/concession contract)<br><br>Reduce the commercial risk of the private partner which make the project more attractive<br><br>The private sector can be partly paid according to Key Performance Indicators which will guaranty the quality of its work and will reduce the risk for Public Authority<br><br>International experience and feedback for this kind of contract<br><br>Contractual obligations on proper O&M and renewal funding<br><br>Less risky for the private sector than a Affermage/lease/concession | Short time contract that will require a new bidding process in few years | Operational risk: shared<br><br>Political risk: yes<br><br>Exchange rate: yes but low<br><br>Force majeure and natural risks: shared |
| **affermage (Fully private or semi Public )** | Medium term contract<br><br>The rent of the Public sector will depend of the cash flow generated by the scheme, If additional profits are generated by the activity, they will be shared between private and Public sector<br><br>Provision for renewal fund of the O&M assets can be asked to the private sector<br><br>Can be manage with a fully private company or a semi-public company<br><br>Contractual obligations on proper O&M and renewal funding<br><br>Less risky for private sector than a lease or a concession | The Public sector support all the investment<br><br>The public sector get a rent according to the level of cash flow generated by the scheme | Operational risk: shared<br><br>commercial risk: shared<br><br>Political risk: yes<br><br>Exchange rate: yes but low<br><br>Force majeure and natural risks: shared |

| SVIP phase I | Pros | Cons | Main risk assumed by private operator |
|---|---|---|---|
| **Lease (Fully private or semi Public )** | Medium term contract<br>The Public sector have a fixed rent (lease fee) from the Private sector<br>Provision for renewal fund of the O&M assets can be asked to the private sector<br>Can be manage with a fully private company or a semi-public company<br>Contractual obligations on proper O&M and renewal funding<br>Less risky for private sector than a concession | The Public sector support all the investment<br>The private sector margin will depend on the cash flow generated by the scheme, If additional profits are generated by the activity, they will profit to the private sector | Operational risk: shared<br>commercial risk: yes<br>Political risk: yes<br>Exchange rate: yes but low<br>Force majeure and natural risks: shared |
| **Concession** | Financial contribution of private sector<br>Efficient construction through EPC<br>Contractual obligations on proper O&M and renewal funding<br>Good incentives<br>Can be manage with a fully private company or a semi-public company | If public contribution to investment costs is too high it can attract pure general contractors (without O&M and irrigation experiences)<br>Required export cash crops to guaranty the capacity to pay of the farmers, and to hedge the currency risks | Operational risk: yes<br>Commercial risk: Yes<br>Political risk: yes<br>Exchange rate: yes<br>Force majeure and natural risks: shared |

## 4.1 SELECTED PPP OPTION AND RISK ASSESSMENT

A general risk assessment has been carried out in the preliminary assessment report. In this report details are provided for the specify case of the concession.

A concession gives an operator the long-term right to use all utility assets conferred on the operator, including responsibility for all operation and investment. Asset ownership remains with the authority. Assets revert to the authority at the end of the concession period, including assets purchased by the operator. In a concession, the operator typically obtains its revenues directly from the consumer and so it has a direct relationship with the consumer. A concession covers an entire infrastructure system that is precisely defined in the concession contract from the upstream intake infrastructure to the downstream delivery points. The infrastructure system may be only composed by the main infrastructure, or integrate also the secondary infrastructure for example. A concession may include the operator taking over existing assets as well as building and operating new assets as long as these assets belong the defined infrastructure system.

### Key Features

- A concession gives a private operator responsibility not only for operation and maintenance of the assets but also for financing and managing all required investment.
- The operator takes risk for the condition of the assets and for investment.
- A concession may be granted in relation to existing assets, an existing utility, or for extensive rehabilitation and extension of an existing asset (although often new build projects are called concessions).
- A concession is typically for a period of 25 to 30 years (i.e., long enough at least to fully amortize major initial investments).
- Asset ownership typically rests with the awarding authority and all rights in respect to those assets revert to the awarding authority at the end of the concession.
- General public is usually the customer and source of revenue for the operator.

- Often the operator will be operating the existing assets from the outset of the concession - and so there will be immediate cash flow available to pay operator, set aside for investment, service debt, etc.
- Unlike most management contracts, concessions are focused on outputs - i.e., the delivery of a service in accordance with performance standards. There is less focus on inputs - i.e., the service provider is left free to determine how to achieve agreed performance standards, although there may be some requirements regarding frequency of asset renewal and consultation with the awarding authority or regulator on such key features as maintenance and renewal of assets, increase in capacity and asset replacement towards the end of the concession term.
- Some infrastructure services are deemed to be essential, and some are monopolies. Limits will probably be placed on the operator–by law, through the contract or through regulation–on tariff levels. The operator will need assurances that it will be able to finance its obligations and still maintain a profitable rate of return and so appropriate safeguards will need to be included in the concession agreement or in legislation.
- In many countries, there are sectors where the total collection of tariffs does not cover the cost of operation of the assets let alone further investment. In these cases, a clear basis of alternative cost recovery will need be set out in the concession, whether from general subsidies, from taxation or from loans from government or other sources.

The following table reminds (i) the risk that are to be taken in account, (ii) who will bear the risk, (iii) what are the potential actions to mitigate the risk in the framework of SVIP

*Table 4-2: Potential actions to mitigate the risk in the case of concession arrangement*

| Type of risk | Description | Allocation | Measures/actions for risk mitigation |
|---|---|---|---|
| Tender process Risk | Risk of unsuccessful tender process | Public authority | To define as much as possible the technical option<br>To carry out a wide marketing campaign<br>To organise proper due diligence and site visit to the potential investor<br>To provide a detail contract and to organise a good committee in charge of evaluation and negotiation with the private sector |
| Commercial risks | Risk of non-payment once the service of irrigation is provided | Private sector | To establish formal contract between the WSP and the final users, that can be either IWUAs; Farmers Property limited companies; private farms; communities (for potable water)<br>To organise the farmers as commercial farms more than individual smallholders (example: smallholders farmers can be organised in trust or coop), (i) to reduce the number of client for the service provider and (ii) to guarantee a good capacity to pay the water service client<br>When possible to levying the ISC from the miller (sugar mill/ ethanol plant/ ginning mill) |
| | Demand risk, when customers use the service less than expected | Private sector | To promote cash crop in order to guarantee to the farmers the capacity to pay the water |

| Type of risk | Description | Allocation | Measures/actions for risk mitigation |
|---|---|---|---|
| | | | To support the farmers in order to build capacity in terms of irrigation practice and to avoid the development of rain-fed agriculture into the command area<br>To promote irrigated crops and high cropping intensity rate into the command area<br>To propose when possible, takes or pay contracts to the clients (mainly the ones that have other source of water such as pumping station directly from the Shire in order to reduce the Demand risk). |
| | Collection risk: the risk to be unable to enforce fee payment | Private sector with the support of public authority (enforcement of the law) | To set up clear contractual arrangement between the Water Service Provider and the farmers that defines the right and duty of each party and the sanction in case of non-payment<br>A good organization of water policing into the scheme area to avoid illegal water withdrawal that could create inequity feelings between users |
| | Land risk: when land conflicts delay the implementation of the project and become an barrier to the development of commercial farms | Private sector | To start to organise the land and the smallholders asap before the construction of the scheme.<br>To market the project among agribusiness companies and to organise an expression of interest process in order to select a number of aggregator in the area that can be in charge of out-growers organisation into trust or coop |
| Operational risk | The infrastructure provided or service delivered:<br>Has higher O&M costs than expected.<br><br>•Is interrupted or ceased because of a fault of the operator<br><br>•Failed to meet original specification | Private sector | The operator of the scheme has to be involved in the design or at list must review the design studies.<br>The construction firm must also be in charge of the operation of the scheme, If the private sector is a consortium between constructor firm and scheme operator, therefore the responsibility of the construction firm must be guarantee over the duration of the PPP contract.<br>The private sector in charge of the water service need to have strong experience in irrigation scheme<br>The implementation of key performance indicators to reduce the risks of inadequate management |
| | The risk that the available water is insufficient for irrigation | ESCOM<br>Public authority | The potential improvement of the dam management upstream of Kapichira reservoir have to be assessed to guarantee a better water availability in the Kapichira reservoir all year long.<br>The potential mobilisation of additional water resource as to be assessed (dam on Nkombedzi river/dam on Mafume river/ dam on Thangdzi river) |

| Type of risk | Description | Allocation | Measures/actions for risk mitigation |
|---|---|---|---|
| | | | To establish clear rules of water sharing between ESCOM and the private sector in charge of SVIP<br>To propose in the contract a sharing of the financial consequences of water failure between the various parties (private sector/users/public authority) |
| Work risk | The risk that quantities or prices of inputs are higher than planned or that construction takes longer, than estimated | Private sector | The private sector contracted has to have confirmed experience in the implementation of this kind of project<br>The references of the selected private company have to be checked before contracting it<br>Performance indicator can be proposed for the construction phase |
| | The risk to have difficulties to access to the site and to not be allowed to use it for the project, the time needed to obtain permits, to comply with regulations and to expropriate if needed | Public sector | In the case of the SVIP, an issue will concern the intake of the canal on Majete Game Reserve land as well as for the phase 2 of the project, the crossing by the main infrastructures of the Lengwe National Park.<br>To propose adapted compensatory measures and mitigation measures<br>The land availability and the permits and licence required must be obtained and check before the beginning of the work |
| Financial risk | The risk of the project failing to obtain financing, or that financing terms will differ from forecasts | Private sector / Public sector | Marketing of the project as to be done as soon as technical options will be well defined in order to identify potential investor.<br>Make the project as profitable as possible in order to guarantee the support from the funding institutions.<br>As in most of the cases, SVIP will require government funds to be financially viable, the government will then need to bear some degree of financial risk. The international experience shows that even in the frame of a concession arrangement the level of public funds is still between 50 to 80% of the total CAPEX<br>The level of private sector contribution will depend on the expected level of water fees. Usually, higher could be sold the water higher will be the contribution of the private sector, however it is important that the level of ISC be in line with the capacity to pay of the farmers |

| Type of risk | Description | Allocation | Measures/actions for risk mitigation |
|---|---|---|---|
| | The risk that variability in foreign exchange rates will affect project profitability. This risk is high when project inflows are in a different currency than project outflows, such as debt repayments or input purchases. | | The forex risk for the private borrower and investor is difficult to address because of the fundamental mismatch between the fact that the debt and equity tend to be denominated in foreign currency whereas the majority of revenue is in local currency, thereby exposing the financial structure to the foreign exchange risk.<br>To limit that risk it would then be important that part of the revenue of the Water service provider come from farmers' revenues resulting of cash crops sold on the international market |
| | The risk related to the variation of the rate of interest | Private sector<br>Water users (farmers or group of farmers), because the high level of interest rate in Malawi may impact strongly the private/communities investment and the viability of the commercial farms implemented | ISC are indexed to local inflation<br>use of currency finance or hedging;<br>Government exchange rate guarantees;<br>Devaluation liquidity backstopping schemes. |
| Environmental and social risk | Risk that the project impact negatively the local environment and the social organisation | Public authority as project master<br><br>The social risk can also be linked with commercial risk re the water fees | To carry out detailed previous studies mainly regarding the crossing of the two national parks (Majete reserve and Lengwe national park)<br>To establish a communication plan in order to inform and to involve the beneficiaries of the project from the early stages.<br>To propose a level of water fees that are in line with the capacity and the willingness to pay of the water users<br>To assess in detail the arrangement in terms of land ownership<br>To propose adequate mitigation measures |
| Political risk | The risk that legal or political changes negatively impact the project.<br>It includes the risks of political decision on water fees/electricity tariff/VAT, inability to repatriate dividends, or inconvertibility of foreign exchange | Private sector | Some government or multilateral agencies offer insurance against these types of risks, such as Political Risk Insurance offered by the U.S. |

| Type of risk | Description | Allocation | Measures/actions for risk mitigation |
|---|---|---|---|
| Force Majeure | The risk of events beyond the control of either party.<br><br>Force majeure risks can be categorized as "insurable" and "uninsurable". Acts of nature, such as earthquakes, floods or droughts are typically insurable. Some political events, such as acts of terrorism or wars, are typically uninsurable | Private sector (insurable risk)<br>Public sector (uninsurable risk) | The risk of flood is high and the impact one the scheme infrastructures can be strong, the Private sector will then have to take insurance for this risk |
| Risk of outright fraud from the private contractor | The private contractor is unable to fulfil its obligations, resulting in insufficient maintenance, poor programming of water distribution | Public sector | To carry out a well manage tendering process<br>To propose a strong PPP contract<br>To set up a clear institutional framework to supervise the contractual arrangement |
| Risk of poor agricultural development | The risk that equipped area is not well used | Public sector | To organise capacity building among the farmers about irrigation practices<br>To promote agricultural research centre<br>To organise the value chains<br>To provide the required infrastructures (road/ storage infrastructure/electricity/etc. ) |

The risks identified in the previous table have been classified in the risk assessment matrix according to the tow parameters: probability of occurrence and consequence of occurrence. This Matrix highlights the risks with the higher probability of occurrence and the major consequence of occurrence.

The matrix shows that in the frame of SVIP the main risk in terms of occurrence and consequence are the financial risk (variability of foreign exchange and variation of rate of interest), the risk of unsuccessful tender and the risk linked to the availability of water during part of the year (dry season).

The work risk and the commercial risks are reduced in the case of a concession arrangement.

Environmental and social risk as well as poor agricultural development risk will be minimise by the early assessment of those issues.

The risk of force majeure, is always existing, hard to predict and could have non negligible punctual impact on the project. According to the type of force majeure the private sector could however be quite operational and can overcome the difficulty much more quickly than if it was managed by the public authority (case of insurable force majeure).

*Table 4-3: Risk assessment matrix*

| | Minor CONSEQUENCE of occurrence | Moderate CONSEQUENCE of occurrence | Major CONSEQUENCE of occurrence |
|---|---|---|---|
| **High PROBABILITY of occurrence** | Land risk when land conflicts delay the implementation of the project and become an barrier to the development of commercial farms (**commercial risk**) | The risk related to the variation of the rate of interest (**Financial risk**) | The risk that variability in foreign exchange rates will affect project profitability (**Financial risk**)<br><br>The risk of events beyond the control of either party such as foold (**force majeure**). |
| **Medium PROBABILITY of occurrence** | The risk that quantities or prices of inputs are higher than planned or that construction takes longer, than estimated (**work risk**) | The risk that equipped area is not well used (rain-fed agriculture and poor agricultural intensification rate) (**Risk of poor agricultural development**) | Risk of unsuccessful tender process (**tender process risk)**<br><br>The risk that the available water is insufficient for irrigation (**Operational risk**) |
| **Low PROBABILITY of occurrence** | The risk to have difficulties to access to the site and to not be allowed to use it for the project, the time needed to obtain permits, to comply with regulations and to expropriate if needed (**work risk**) | Risk of non-payment once the service of irrigation is provided (**commercial risk**)<br><br>Collection risk: the risk to be unable to enforce fee payment (**commercial risk**), for farmers out of WPA arrangement.<br><br>Demand risk, when customers use the service less than expected (**commercial risk**)<br><br>Risk that the project impact negatively the local environment and the social organisation (**Environmental and social risk**)<br><br>The infrastructure provided or service delivered: has higher O&M costs than expected/•Is interrupted or ceased because of a fault of the operator/Failed to meet original specification (**Operational risk**) | The risk of the project failing to obtain financing, or that financing terms will differ from forecasts (**Financial risk**)<br><br>The risk that legal or political changes negatively impact the project (**Political risk**)<br><br>The private contractor is unable to fulfil its obligations, resulting in insufficient maintenance, poor programming of water distribution (**Risk of outright fraud from the private contractor)** |

## 4.2 THE RELATION BETWEEN THE PPP FOR SVIP AND THE WPA

ILLOVO Estates account for more than 50% of the area to be irrigated in phase 1 of the Shire Valley Irrigation Project. Irrigation service charges for ILLOVO should be higher than the ones for the other customers due to the decision by the government to refuse subsidizing a multinational. Combined, these factors explain that ILLOVO would account for at least 62% to 81% of the revenue of the projected PPP for the phase 1 of the SVIP according to WPA options negotiated (cf. Table 5-6 p41). Therefore, the WPA with ILLOVO is the cornerstone of the project.

In the PPP structuring, we decided to extend this approach to all the trusts and farmer's organizations. The same benefits than the one developed for Illovo apply in terms of commitment, visibility and simplicity. The changes from the Illovo framework will be in the currency used and the level of subsidy agreed on for infrastructure development. The other significant change will be on the guarantees offered by the farmer's organizations on the payment. We cannot expect the same credit from the trusts and from Illovo and we can't expect this risk to be covered by bonds as in the case of Illovo.

In order to analyze the impact of a successful completion of the negotiation with ILLOVO the WPA, it is important to consider the risks to the PPP project with and without this WPA.

### 4.2.1 Sugarcane market prospects in terms of risk

The FAO and OCDE prediction on the sugar world market for the next 10 years is a price stabilization (Agricultural Outlook 2016-2025, OCDE-FAO, 04 July 2016): 330 USD/t in 2017 to 342 USD/T in 2025 for raw sugar (388 to 424 USD/T for white sugar), with even a low of the real value during this period.

The condition for selling sugar to European market has changed (reform of the common market organization for sugar in European Union) with a strong impact on the Illovo market opportunities.

From Illovo source, the local demand represents around 50 % of their production, and it is not possible anymore to sell all the production on the European market as the price would be below the Illovo production cost. In that perspective, Illovo has adapted its marketing policy; after first fully satisfying the local market requirements, the strategy is to move from the lower-priced EU raw sugar markets to the relatively better-priced regional market, and also to focus on increasing the sales of speciality sugars into the EU and USA markets. On the other hand, the company is working on improving initiatives, including structural cost to reduce the impact of potential difficult economic environment (high borrowing rate, currency rate volatility, etc.) on operating margin. The financial annual reports show that Illovo is maintaining operating profit (commercial strategy) and profit (control of the finance costs) as shown in the Table 4-4. Moreover the two estates of the Illovo Group in Malawi are contributing by 38% to the Group operating profit in 2015 that makes the Illovo Sugar Malawi the most profitable factory of the Group in regard to the level of the sugar production.

Considering the prediction of the FAO regarding the sugar market (stabilization of prices), as well as the competiveness of the Illovo Sugar Malawi compared to the other regional factories of the group, and the market diversification of the Illovo Sugar Malawi (raw sugar and white sugar production, specialty sugar produced in Nchalo factory; sales in the local market, EU and USA markets and regional market), the Illovo Sugar Malawi appear financially sustainable.

*Table 4-4: Illovo Sugar Malawi Ltd performance from 2007 to 2016*

| | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating profit (K million) | 18 248 | 23 429 | 28 613 | 32 478 | 12 034 | 9 736 | 10 915 | 9 740 | 7 945 | 7 222 |
| Profit before taxation (K million) | 8 142 | 19 550 | 27 038 | 30 008 | 11 650 | 9 179 | 10 257 | 9 144 | 7 233 | 6 882 |
| Hectares harvested | 19 198 | 18 961 | 19 567 | 20 179 | 19 698 | 19 521 | 19 717 | 18 674 | 18 345 | 17 996 |

*Source: Illovo sugar Malawi Ltd - Annual reports from 2007 to 2016*

As a consequence, Illovo may not anymore be in a position to plan new investment and afford to be equity partner. However they would be interested to go for a WPA. Indeed, by integrating SVIP Illovo could save power from their pumping stations and then sell it to the national grid. Depending of the price condition of the WPA, Illovo would take advantage by integrating SVIP as it would be an opportunity to increase its productivity by reducing energy cost.

### 4.2.2 Demand risk

Without the WPA and ILLOVO, the demand for irrigation water will be constrained by the capacity to pay of the trusts and independent farmers. The experience so far shows that some trusts have real governance problem and this has a negative impact on their solvency. From the point of view of any lender to the private partner in the PPP, this situation creates an increased risk for the demand of irrigation water from the project. Obviously, if a trust is insolvent, it will terminate its activity and stop using irrigation water. It is similar for an independent farmer.

Therefore, without ILLOVO the demand risk is increased. That means that the premium for covering this risk will be added in the irrigation service charge. With ILLOVO, this risk is reduced for more than 45% of the water demand. ILLOVO is a big firm, publicly listed, and therefore its credit standing can be monitored much more easily. It is regularly evaluated by rating agencies. Even from the point of view of the private operator, it is much easier to monitor the operations of this firm. A reduced demand risk means a reduced premium to cover it and translate to a reduced irrigation service charge for the project.

### 4.2.3 Payment risk

The situation is similar for payment risk. Without a WPA, the payments are not secured by a performance bond. Therefore, the private partner in the PPP will bear the solvency risks of its clients. This will increase irrigation service charges with the premium used to cover this risk.

On the contrary, with a WPA, the private partner to the PPP is covered from the non-payment risk by performance bonds from ILLOVO.

### 4.2.4 Financial risks: bankability and exchange rate risks

Two financial risks are to be considered in regard to the WPA.

The first one is on bankability, regarding the willingness of lenders to commit money to the project. As it has already been stressed, without the WPA, the demand and payments risks are quite high and could prevent lenders to commit themselves to the PPP. With the WPA, the risks are reduced. The quality of the credit of ILLOVO, the long-term commitment, the share of ILLOVO in the global revenue of the PPP are assets for the PPP in order to convince the lenders.

The second financial risk to be considered is the exchange rate risk. The financial instability in Malawi is such that interest rates, real and nominal, are very high. The exchange rate risk is in consequence very high. In order to reduce the financial cost, it is better to rely on high currency loans to benefit from low interest rates. Without the WPA, the sole option would be to rely on a public guarantee or subsidy to support the project. With the WPA, the government finance will be less exposed. Essentially, if the WPA state that irrigation service charges are to be paid in hard currency, it will create a stream of revenue for the PPP in hard currency and makes it able to borrow in the same currency.

### 4.2.5 The WPA and the PPP project

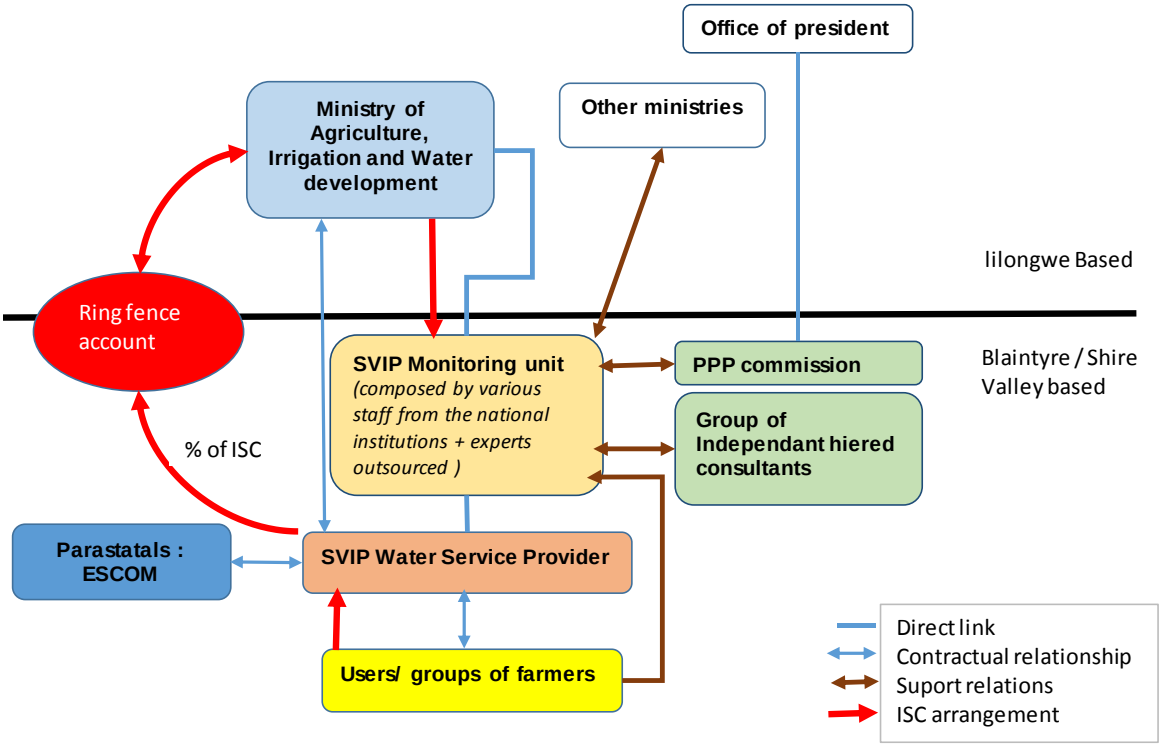
To secure the commitment of ILLOVO to a WPA would improve tremendously the chances of a successful PPP for the Shire Valley Irrigation Project. As has been already stressed, ILLOVO will represent about 70% of the expected revenues for the PPP. And the basic proposition of a WPA is to secure the payment of the water delivered to ILLOVO through long-term contract and performance bonds. So the WPA will help us solve the most difficult problem for PPP which is securing a stream of revenue that allows to pay back the loans insured by the private partner in order to construct the infrastructure. Secondly, securing the WPA will open to the private partner external capital markets therefore reducing the cost of its financing, if ILLOVO agrees to pay its irrigation service charges in US dollars. ILLOVO can do it because it's an exporter with about 50% of its receipts in foreign currencies.

It is therefore of the upmost importance for the project success to negotiate successfully with ILLOVO this WPA.

## 4.3 MONITORING OF THE PPP CONTRACT

The SVIP PPP will be regulated by the contract but it is required that a Contract Monitoring Unit be established. It is recommended that the Monitoring unit be composed by representatives of the ministry of agriculture, Irrigation and water development, representatives of ministry of finance and representatives of the PPP commission. PPP Contract Monitoring Units require resources in terms of capable staff, adequate information technology systems, and the budget resources needed to gather and verify technical, operational, financial, and legal performance data

*Figure 4-1: Institutional organization for the management of PPP contract*



In general, PPP Contract Monitoring Units need the human and budget resources for:

- Gathering and verifying data on the technical performance of a PPP, as specified by the key performance indicators and "out-puts" required by the PPP contract
- Gathering and verifying financial and cost performance data of contract
- Monitoring and ensuring compliance with and enforcement of the legal terms and conditions of the contract
- Coordinating with other relevant compliance bodies and regulators or outside monitoring specialists, such as specialized outside lawyers, engineers, environmental specialists, or other experts retained to advise on specific PPP performance issues

PPP Contract Monitoring Unit such as the one for SVIP will require a team of different specialists responsible for monitoring technical, financial, legal, consumer service or other areas of performance. . The unit will be in charge of the day to day supervision of the private operator. The composition of the unit in terms of human resources might require the following positions:

- 1 Unit chef
- 1 legal expert
- 1 S&E specialist
- 1 irrigation engineer
- 1. Accounting specialist

Those specialists can be provided by the various ministries mentioned above. The monitoring unit might not require full time job for all of these positions.

### 4.3.1 Key Performance Indicator (KPI)

This section describe how the PPP contract monitoring body could monitor the performance of the private service provider during two key stages of the contract's life: the construction of the facilities, and the operational phase, when the project's services are being delivered and made "available" to end users. PPP contract monitoring requires continuous monitoring of performance, not just the construction of new assets and facilities. The aim is to ensure that the private service provider complies with contract provisions throughout the life of the contract. These performance monitoring stages are crucial steps to keep maintaining the whole life performance. Without this activity, it would be possible for private service providers to increase their profits or reduce their costs (or both) by reducing the levels of service that they provide, because their performance levels are not being monitored or measured.

#### Performance monitoring during the construction phase

During the construction phase the PPP contract monitoring body should assess the following indicators:

*Table 4-5: Performing monitoring during construction phase*

| Field of the KPI | Level above which penalties are required | Means of control and frequency of reporting | Type of penalties | Quality assurance |
|---|---|---|---|---|
| Delay for work construction achievement | Each day of delay compared to the initial dead line | Document certifying the achievement of the work | Lump sum penalty per day of delay | Contract document<br>Detailed approved planning of the contractor<br>Records of meetings at the site of the work |

| Field of the KPI | Level above which penalties are required | Means of control and frequency of reporting | Type of penalties | Quality assurance |
|---|---|---|---|---|
| | | | | Notice of approval of works |
| Environmental offence during construction | Each recorded offences | recorded offences | Lump sum penalty per offences | Contract document<br>Records of meetings at the site of the work<br><br>Finding of environmental offence |

Other indicators can be proposed and followed by the monitoring body, however some of them cannot be subjected to penalty:

- The availability of land that the project requires for construction to begin (before the beginning of the work)
- The delivering of permits and licenses that the private service provider needs to begin construction: environmental permits, zoning permits, building permits, import approvals, etc. (before the beginning of the work).
- The attestation that the project's financial closure has been clearly reached by the private service provider's lenders (before the beginning of the work)
- The commissioning and testing of the new facility been completed (after construction is concluded)
- The reception and the verification of the private service provider's performance bond (this guarantee must be set up after construction is concluded and will be maintained over a defined period of time).

## Performance monitoring during the operational stage

As already mentioned in the risk assessment table, the implementation of KPI could be proposed to reduce the operational risk and to guarantee to the public authority the quality of the service provided by the private sector. The implementation of such KPI requires never the less from the public Authority to be able to control some indicators of performance linked to the water service and potentially enforce the Water Service Provider to pay penalties when those indicators are not achieved.

In the framework of a concession arrangement the implementation of KPI is more complicated than in a contract management where the WSP is directly paid by the public authority. As in a concession arrangement the Water Service Provider is directly remunerated from the final user the only way to enforce performance indicator is to propose a specific article in the contract that deal with penalties in case of non-achievement of performances.

This article can specify that once the infrastructures are finished the delegating authority may require the WSP after prior notice, payment of penalties. The field concerned by the KPI and the system of penalties could be as following:

*Table 4-6: Performing monitoring during operation phase*

| Field of the KPI | Level above which penalties are required | Means of control and frequency of reporting | Type of penalties |
|---|---|---|---|
| Efficiency of the water service | An efficiency level could be define at 80% of efficiency | *Means of control:* Difference between the water taken at kapichira Dam and the water sold to the farmers *Frequency of reporting:* at the end of each irrigation campaign | The penalty could be the additional losses multiplied by a % of the ISC (expl: 10% of ISC) The penalty has to be paid to Public Authority |
| Failure of the meters at the water intakes | In case of problem in water meter equipment at the intake, the Public Authority must be informed in a delay of 24 hours of the failure and the reparation/replacement of the material must be done within 10 days from the finding of the failure | *Means of control:* Analyse of the daily data, and periodical control of the water meters installed at the intakes *Frequency of reporting:* weekly | The estimation of the quantities lost (the rule must be defined in the contract) time a % of the ISC (10% of ISC) The penalty has to be paid to Public Authority |
| Non distribution of water demand/Complaints on irrigation services | If for any reasons other than those identified in the article linked to "total or partial suspension of the distribution", a user doesn't receive the quantity of water is paying for (adjusted quantity during dry period) , the WSP will have to compensate the concerned farmer and the Public authority | *Means of control:* Completion from the users Verification of the data base volume subscribed and volume sold *Frequency of reporting:* at the end of each irrigation campaign | Quantities of water non distributed time a % of the water price (10%) plus reimbursement of each user's share of the annual fee corresponding to the allocation subscribed for the irrigation period and not delivered by the WSP The penalty shall be paid to users concerned, if necessary by deducting the amounts of irrigation fee owed by these users |

**Performance Measures for KPIs** will be measured and recorded as appropriate and reported on at specific times as indicated in the above table. The values will be presented to the monitoring body together with all relevant documentation and evidences, to determine compliance and the level of penalties to be applied. As required, justification of results or checking or measurement may be required to be carried out jointly with monitoring body representative. Results will be disclosed to the users.

The monitoring process need to be planned for the entire PPP project life cycle. The construction of the project must be monitored by the monitoring body before and over the construction period. The operating stage, however, needs to be monitored for the entire PPP contract terms of 20 to 30 years according to the type of PPP arrangement (25 years in SVIP case)

In terms of monitoring the following issues need to be keep in mind:

- It is required to select performance indicators that are objective, quantitative, & verifiable readily verified and not subject to interpretation
- It is recommended to select the most important performance data to monitor and analyse rather than the most numerous. By limiting performance data only to the most important ones that cover the biggest areas of the contractor's performance reduce the amount of work of the monitoring body and then is less time consumer.
- The costs and physical requirements of gathering, analyzing, and verifying performance data must be taken in account at an early stage in order to not over-look or underestimate it.

In addition to the KPI a number of reports/deliverables can be asked to the private sector in order to guarantee additional monitoring of the scheme manager activities. For example these reports could as follow:

*Table 4-7: List of deliverables that can be ask to the private sector*

| Ref | Report | Description |
|---|---|---|
| 1 | Detailed Irrigation Management Plan | Preparation of a strategy and detailed plan for the management of the SVIP including staffing logistics financial controls, stakeholder liaison and engagement. The plan would present the proposals for the proposed cost recovery and tariff. Detailed management plan would be discussed and agreed with the SVIP monitoring unit |
| 2 | Annual Work Plans | Preparation of annual work plans and budgets to be presented and to be agreed by the Monitoring Unit. Work plans should show estimated revenues, costs and proposals for maintenance works. Annual assessments of maintenance requirements will be prepared and will be presented in this report. |
| 3 | Quarterly progress and annual report | Quarterly progress and an annual report to be submitted to the monitoring unit. Reports would show financing and outputs of operation and maintenance work. The annual report would be supported by an external independent audit. The quarterly and annual report would include progress of the Key Performance Indicators (KPI). |
| 4 | Information system report | Annual report on main data collected and up dated in the data base: rainfall, level and flow in the canal, volumes delivered; land register; agriculture; etc. |
| 7 | Management Operations and , Maintenance Manuals | The subjects covered should include all areas of OM including operational methodologies, maintenance and administrative procedures. |

In accordance to (i) the type of PPP arrangement and (ii) the tasks asked to the private sector, the number of deliverables and the type of deliverables can be adapted. Usually higher are the risks borne by the public sector higher will be the requirement for monitoring the private sector performance. For example, under a concession arrangement, the commercial risk are supported by the private sector, monitoring the level of ISC collection rate becomes then not useful for the public sector.

### 4.3.2 Capacity building

Developing a project through a PPP is demanding. The government needs to be able to manage the legal and financial dimensions and to be able to supervise the contract. Fortunately, it can rely on the PPP commission with its trained lawyers and financiers to structure, negotiate and supervise the contract.

Civil servants trained in procurement usually approach PPP contract management as they deal with procurement contract. They often disregard the need for external assistance in supervising the PPP contract. It is much easier to contract an audit firm to control and audit the accounts of the private partner than to do it directly. Regarding the maintenance program, it is much easier to rely on an external consultant than to do it directly.

Therefore, in bridging the gap in the capacity of line agencies to structure, award and manage PPP contracts, we will focus on drawing the line between what the government has to do and what it can outsource. This will allow the focus to be placed on the important task of engaging private operators and designing risk sharing that are the basis for successful PPP.

We will provide examples of successes and failures in real cases during our workshops in order to build capacity to oversee successfully PPP contracts.

# 5. FINANCIAL ASSESSMENT

The main goal in developing a financial model is to test the feasibility of different PPP options. The financial analysis enables the owner of the infrastructure and the Private sector to appraise their profitability

## 5.1 FINANCIAL MODEL

All the monetary data is provided in Malawi Kwacha and USD. The model has been built with Microsoft Excel. The Excel system of spreadsheets file is clearly organized in order to facilitate understanding. The structure of the file is as following:

1. **A "Dashboard".** The main variables, linked to the financial analysis and which can impact on the output of the model, can be modified.

**The dashboard is divided into three main sections:**

**General assumptions**: it deals with inflation rate and discount rate used by the model

- National (from 17% to 7%) and international (2%) inflation rate, USD conversion linked to inflation differentials (5% to 15 %);
- Discount rate (10%); Discount rate used for private investment (4.5%); discount rate used for public investment (2%)

**WPA assumptions**: its deals with the variable that can impact the level of ISC

- Duration of WPA contract: 25 years
- Irrigated areas used to estimate the level of participation to the collective infrastructure (main canal/intlet) proportionally to the irrigated surface of the various stakeholders (Illovo; Phata; Kasinthula; Sandee ranch; new development lands):

*Table 5-1: Irrigated surface of the various areas concerned by the project*

| | | |
|---|---|---|
| surface Project total | 42 500 | ha |
| surface Project phase 2 only (Bangula canal + siphon) | 21 090 | ha |
| surface Illovo | 9 995 | ha |
| surface kasinthula/phata/sandee ranch | 2 179 | ha |
| surface new land I1 | 5 020 | ha |
| surface area A | 4215 | ha |

*Source:TFS study*

- Rate to estimate the contingency cost of the infrastructures: 20% of CAPEX
- Rate to estimate the study cost linked to the development of the project: 6% of the CAPEX
- Integration of the various CAPEX cost in the calculation of the WPA. 3 options proposed
  - All costs taken in account
  - Cost related to tertiary canal and infield investment not taken in account for the trust and new development area
  - Cost related to tertiary canal / infield investment / main canal / inlet not taken in account for the trust and new development area

- Other hypothesis such as duration of Public loan (15 years) interest rate of public loan (2%) grace period (3 years) and equity for private (0) can be modified case per case. The figures used as assumption are representative of international practices. If specific national values can be provided either by the international funding agencies working on SVIP or by Malawi Ministry of Finance, then the model will take these new figures in account.
- The estimation of O&M cost base on the investment cost are defined as per the TFS (2% of the investment cost for the inlet and Siphon and 1% of the investment cost for all the other infrastructures.
- The estimation of provision for renewal fund and big repair (0.5 %of investment cost)

**PPP arrangement assumptions**: it deals with the assumption used to define the profitability of the various PPP arrangement according to the 3 options of WPA

- Percentage of management fees according to the type of contract (12% for affermage and lease and 10 % for Management contract)
- Profit taxes for the private sector (30%)
- Duration of the various contract (concession: 25 years / Lease and affermage: 15 years / Management contract: 10 years)
- Characteristic of public and private loan
  - Private sector loan: duration 15 years ; interest rate 4.5% ; grace period 3 years ; level of Equity (according to options)
  - Public sector loan: duration 15 years ; interest rate 2 % ; grace period 3 years
- Other assumptions such as recollection rate for the various areas; level of contribution to the renewal fund for big repair; level lease fees for the public authority; estimation of O&M cost based on investment cost; level of provision for renewal fund; level of public authority lease fees; percentage of participation of the private sector to the CAPEX; etc. can be modified case per case for each kind of PPP arrangement and for each options linked to ISC level.

It is important to note that the percentage of capital cost (CAPEX) supported by the parties is a main variable of the model. By using the various assumptions, the model try to reach as much as possible objectives in terms of FIRR; Cover cash flow debt service ratio; FIRR return on equity. The simulation made stressed the profitability of the various options i.e. more profitable will be the option, higher will be the potential funding undertaken by the private sector.

For /lease/affermage options, the public authority through a loan in USD undertakes all the capital cost. The private sector only bears the cost of O&M assets through equity.

For Contract Management options, the public authority through a loan in USD undertakes all the capital cost even the cost of O&M assets

2. **A price schedule**. The conversion rate of the USD into MK can be modified in this spreadsheet

3. **Various spreadsheets** are then proposed for water requirement; investment programme (CAPEX; O&M asset); OPEX (Maintenance cost of infrastructures/ operation costs); estimation of ISC (WPA); cash flow assessment for concession arrangement and other PPP arrangements (management contract/lease/affermage); Value for money assessment

4. **Outputs spreadsheets:** they provide the results of the financial model in terms of WPA and in terms of PPP arrangement financial assessment.

The analysis is carried out in current price.

### 5.1.1 Investment cost (CAPEX)

The CAPEX used are those provided by the TFS team. Two main options were proposed in terms of CAPEX:

1. The cost of the project with Illovo canal
2. The cost of the project with Illovo pipe.

In TFS the option that seems to have been detailed is the one with Illovo canal, however the final choice will be given by the main party concerned, i.e.: Illovo which will repay through the WPA the investment cost of its infrastructures.

The following tables summarise the CAPEX (in USD constant) according to each options as provided by the TFS:

*Table 5-2: CAPEX Phase 1 and 2*

| | Option canal Illovo | Option pipe Illovo |
|---|---|---|
| | **Investment cost–M. USD** | **Investment cost – M.USD** |
| Inlet | 4.00 | 4.00 |
| Feeder | 33.10 | 33.10 |
| **PHASE I** | | |
| **ZONE I-1 (canal option for Kasinthula / Phata)** | | |
| Branch I1 | 0.30 | 0.30 |
| Branch I2 - partie 1 | 1.25 | 1.25 |
| Branch I2 - partie 2 | 0.49 | 0.49 |
| Branch I3 | 0.90 | 0.90 |
| Branch I4 | 0.52 | 0.52 |
| Branch I5 | 0.25 | 0.25 |
| Secondary + Tertiary canals | 9.78 | 9.78 |
| Infield surface | 44.31 | 44.31 |
| Infield drainage and road | 11.08 | 11.08 |
| **ZONE I-2 (canal option)** | | |
| Illovo canal | 5.90 | 34.60 |
| **ZONE A** | | |
| Bangula canal A | 7.80 | 7.80 |
| Zone A canal (siphon) | 11.60 | 11.60 |
| Branch A1 | 0.05 | 0.05 |
| Branch A2 | 0.38 | 0.38 |
| Branch A3 | 0.32 | 0.32 |
| Branch A4 | 0.36 | 0.36 |
| Branch A5 | 1.00 | 1.00 |
| Secondary + Tertiary canals | 7.27 | 7.27 |
| Infield surface | 32.94 | 32.94 |
| Infield drainage and road | 8.24 | 8.24 |
| TOTAL INFRASTRUCTURE phase 1 | 181.82 | 210.52 |
| Contingency (20% of direct cost) | 36.36 | 42.10 |
| Consultant (6% of direct cost) | 10.91 | 12.63 |
| TOTAL PROJECT Phase 1 only | 229.09 | 265.26 |
| Phase II | | |
| Bangula phase II | 31.80 | 31.80 |
| Branch phase II | 7.00 | 7.00 |
| land consolidation B / C / D | 30.38 | 30.38 |

| | Option canal Illovo | Option pipe Illovo |
|---|---|---|
| | Investment cost–M. USD | Investment cost – M.USD |
| Secondary & tertiary B /C/ D | 134.09 | 134.09 |
| Road and drainage B / C /D | 33.52 | 33.52 |
| TOTAL INFRASTRUCTURE | 236.79 | 236.79 |
| Contingency (20% of direct cost) | 47.36 | 47.36 |
| Consultant (6% of direct cost) | 14.21 | 14.21 |
| TOTAL PROJECT Phase 2 only | 298.36 | 298.36 |
| TOTAL PROJECT Phase 1 and 2 | 527.45 | 563.61 |

*Source: BRLi financial model for SVIP*

In the framework of this study only the CAPEX of phase 1 have been taken in account for the structure of the PPP.

The planning of work realisation for the basic option considered and for the phase 1 only will be spread over the first three years of the project. After three years there is no more need for additional investment.

*Table 5-3: Programme of work realisation*

| | | number of years for construction | starting date |
|---|---|---|---|
| Primary infrastructures | | | |
| Inlet | USD | 3 years | 2017 |
| Feeder | USD | 3 years | 2017 |
| PHASE I | | | |
| ZONE I-1 (Branches and other) | | 1 year | 2019 |
| ZONE I-2 (Branches and other) | | 1 year | 2019 |
| ZONE A | | | |
| Bangula canal A | USD | 3 years | 2017 |
| Zone A canal (siphon) | USD | 3 years | 2017 |
| Branches and other | USD | 1 year | 2019 |

*Source: BRLi financial model for SVIP*

According to the propose planning of work construction the CAPEX have been calculated in current USD based on an inflation rate of 2% (international inflation rate)

It is assumed that private operator in case of the concession and lease or affermage contract will pay the O&M assets. In case of management contract, the Public authority will pay them under the contract arrangement.

The O&M assets where not provided by the TFS but have been estimated in the current study as following (Table 5-4):

*Table 5-4: O&M assets*

| Item | Number | Cost (USD) | Total (USD) | Total (M. MK) | Life expectancy |
|---|---|---|---|---|---|
| Vehicles (4*4) | 3 | 50 000 | 150 000 | 107 | 5 |
| Computer / software | 10 | 1 200 | 12 000 | 9 | 3 |
| Offices equipment | 1 | 21 600 | 21 600 | 15 | 10 |
| Workers and waterman equipment | 2 | 1 500 | 3 000 | 2 | 3 |
| Full equipment workshop | 1 | 50 000 | 50 000 | 36 | 10 |
| Contingencies (15%) | | | 35 490 | 25 | |

| | | | |
|---|---|---|---|
| | **17** | **272 090** | **193** |

*Source: BRLi financial model for SVIP*

Annual amortization charges have been estimated for the investment made by the private sector only (CAPEX and/or O&M Assets). Those charges have then been taken into account only for the PPP options that involve the private sector in the capital cost (Concession for CAPEX and O&M assets and lease / affermage for O&M assets). The annual amortization charges for each item financed by private sector are calculated over the contract period.

In the case of concession arrangement, the private sector will participate in the initial investment (CAPEX). Therefore, debt service of the private sector loan has been taken into account in the financial model to assess this PPP option. The higher will be the level of the ISC, the higher will be the participation by private parties in the CAPEX.

In the case of Management contract / lease / affermage, the private sector will not be involved in investment functions (no participation to CAPEX). Therefore, no debt service of the private sector loan has been taken into account in the model. The O&M Assets funded by the private sector in the lease and affermage contract are supposed to be paid on equity and not through a loan.

### 5.1.2 Incomes of the private operator

The incomes of the project are strongly linked to (i) the ISC, (ii) progressive increase in irrigated land and (iii) recovery rate.

For this model various tariffs have been defined (in the framework of the WPA) for each kind of water users:

- Illovo state;
- Existing trust (Phata/kasinthula/sandee ranch)
- water users in the area I1 new development land
- water users in area A new development land

and for the 3 options of WPA:

- All investment costs are paid through the WPA (cost of the main infrastructures proportionally to the surface irrigated/ cost of branches/ cost of tertiary canal and infield surface/drainage/road;
- For the existing trusts (Phata/Kasintula and Sande ranch) and new development land, the cost of tertiary infrastructures and infield investment are out of the water cost;
- For the existing trusts (Phata/Kasintula and Sande ranch) and new development land, part of the cost of the main infrastructures (main canal and inlet) as well as the cost of tertiary infrastructures and infield investment, are not included in the ISC.

The structure of the tariff (according to consumption or according to surface), the charging mode of the ISC (charge directly to the farmers or through their organisation or through the agro industrial mill) and the annual tariff adjustment, can be discussed during the WPA negotiation phase and proposals can be made by the private operator in charge of managing the scheme during the bidding process. At this stage of the assessment, the annual tariff adjustment is based on inflation rate and the ISC proposed is binomial with (i) a fixed part paid according to the area irrigated and (ii) a variable part paid according to the volume of water used. The fixed part covers the payment of the financial cost of the loan required to pay the infrastructures and the variable part cover the OM cost, renewal fund and national water authority fees. The detail of the tariff estimation is presented in the section 5.2 of the report

SVIP recovery rate has been estimated to be 100% for Illovo and other trust which will be guarantee by the WPA. However, the recovery rate for the new development land have been estimated to 95% due to the current uncertainty concerning the farmer's organisation that will be set up.

Concerning the development of the irrigated areas (Table 5-5), it will depend (i) on the ability of the future users to develop new irrigated land once the main infrastructures will be operational (ii) on the cropping pattern that will be carried out and that could impact on the cropping intensity and water requirement. To deal with the financial model requirements, assumptions have been taken concerning those two issues.

The rising of irrigated surfaces will be as follow:

*Table 5-5: Assumption about increase of irrigated areas*

| | Year 0 2016 | Year 1 2017 | Year 2 2018 | Year 3 2019 | Year 4 2020 | Year 5 2021 |
|---|---|---|---|---|---|---|
| Surface Illovo | 0% | 0% | 0% | 100% | 100% | 100% |
| Surface Trust and venture | 0% | 0% | 0% | 50% | 75% | 100% |
| Surface other | 0% | 0% | 0% | 50% | 75% | 100% |

*Source: BRLi financial model for SVIP*

The water demand used in the framework of the financial model has already been presented in the *table 2.3; estimation of water requirement for phase 1*. These estimations are based on the data provided by TFS in order to be as much as possible in line with the design proposed. To estimate the water volume sold, the average crops water requirement has been used whereas the design of the infrastructures was based on the 5 years water requirement.

As describe in the table above, the extension area will be irrigated by furrow irrigation. The cropping pattern will focus on cotton during dry season and on maize, soya beans, dry beans and trop fruit. The propose cropping pattern for the extension must provide (i) a cash crop production in order to give to the farmers the ability to pay for the water and (ii) food production for human and animal in order to contribute to the national food security.

The next table (Table 5-6) summarized the NPV by option of the income generated over the period of the contract:

*Table 5-6: NPV of the incomes generated according to option*

| | | Propose variable part of ISC (USD/1000m3) | Propose fix part of ISC (USD/ha) | NPV of water sell incomes over the contract period (M. USD) | % of total incomes | Propose variable part of ISC (USD/m3) | Propose fix part of ISC (USD/ha) | NPV of water sell incomes over the contract period (USD) | % of total incomes |
|---|---|---|---|---|---|---|---|---|---|
| | | Project with Illovo canal | | | | Project with Illovo pipe | | | |
| Option 1 of WPA | Illovo | 2.15 | 75 | **9.02** | **16%** | 5.05 | 222 | **24.68** | **34%** |
| | Existing trust | 2.77 | 106 | **2.70** | **5%** | 2.77 | 106 | **2.70** | **4%** |
| | New development area zone I1 | 2.62 | 721 | **24.98** | **43%** | 2.62 | 721 | **24.98** | **34%** |
| | New development area zone A | 3.76 | 698 | **21.08** | **36%** | 3.76 | 698 | **21.08** | **29%** |
| | **Total** | | | **57.78** | | | | **73.43** | |
| Option 2 of WPA | Illovo | 2.15 | 75 | **9.02** | **46%** | 5.05 | 222 | **24.68** | **70%** |
| | Existing trust | 2.77 | 106 | **2.70** | **14%** | 2.77 | 106 | **2.70** | **8%** |
| | New development area zone I1 | 1.66 | 55 | **2.98** | **15%** | 1.66 | 55 | **2.98** | **8%** |
| | New development area zone A | 2.91 | 109 | **4.72** | **24%** | 2.91 | 109 | **4.72** | **13%** |
| | **Total** | | | **19.42** | | | | **35.08** | |
| Option 3 of WPA | Illovo | 2.15 | 75 | **9.02** | **62%** | 5.05 | 222 | **24.68** | **81%** |
| | Existing trust | 1.85 | 62 | **1.66** | **11%** | 1.85 | 62 | **1.66** | **5%** |
| | New development area zone I1 | 0.80 | 11 | **0.94** | **6%** | 0.80 | 11 | **0.94** | **3%** |
| | New development area zone A | 2.04 | 64 | **3.01** | **21%** | 2.04 | 64 | **3.01** | **10%** |
| | **Total** | | | **14.63** | | | | **30.28** | |

*Source: BRLi financial model for SVIP*

As shown in the above table the level of incomes for the private will strongly depend on the proposed infrastructures for Illovo (Canal or pipe) and on the option chosen to estimate the tariff in the WPA. In all cases it is important to note that Illovo represents an important part of the service provider revenues (between 16% up to 81% according to the option).

At this stage of the study, the providing of drinking water supply for communities have not been taken into account in the financial model. Selling water for communities for water supply could represent an additional income for the operator. The level of the water supply charge could be calculated based on the variable part of the tariff proposed for the farmers, if the operator is only in charge of selling gross water to water supply stations. However, if the communities want the scheme operator to be in charge of the water supply station and may be other services (O&M of the water supply scheme, etc.) negotiated contract can be signed, case by case, between the operator and the communities. Whatever the case, it will be important that the relations between the scheme operator and the community are based on formal water delivery and/or O&M contracts).

### 5.1.3 O&M cost (OPEX)

O&M costs of the project are (i) Staff and labour cost, (ii) operating cost, (iii) maintenance and management Costs (Margin of the service provider). The costs are presented in this section.

The Staff and labour cost where not provided by the TFS. Therefore, they have been estimated for phase 1, based on the assumptions that a private company will manage only the main infrastructures of the scheme and that the number of client will be strongly reduced due to farmer's organisation into trusts (Table 5-7). The proposed management team has then be reduced compare to the one that was proposed into the preliminary report assessment.

*Table 5-7: Staff for operation and Maintenance (phase 1 only: 21,000 ha) per year*

| Position | Number | Net Annual Cost (USD) | Gross Total (USD) | Gross Total (M.MK) |
|---|---|---|---|---|
| General Manager | 1 | 21 600 | 30 857 | 22 |
| Chief of Operation Dept | 1 | 16 800 | 24 000 | 17 |
| Chief of Maintenance Dept | 1 | 16 800 | 24 000 | 17 |
| Chief of Irrigation Sector | 1 | 12 000 | 17 143 | 12 |
| Engineer | 1 | 14 400 | 20 571 | 15 |
| Human ressources Dept Chief | 1 | 16 800 | 24 000 | 17 |
| Security Chief Unit | 1 | 12 000 | 17 143 | 12 |
| Administrative staff | 0 | 9 600 | - | - |
| Customers Unit Chief | 0 | 12 000 | - | - |
| Chief Accountant | 1 | 16 800 | 24 000 | 17 |
| Specialized workers | 4 | 7 200 | 41 143 | 29 |
| Drivers | 3 | 4 800 | 20 571 | 15 |
| Waterman | 4 | 4 800 | 27 429 | 19 |
| Collection fee agents | 0 | 6 000 | - | - |
| Assistant accountant | 1 | 6 000 | 8 571 | 6 |
| Secretary | 4 | 3 600 | 20 571 | 15 |
| Workshop chief | 1 | 9 600 | 13 714 | 10 |
| Guards | 4 | 1 800 | 10 286 | 7 |
| **Total** | **29** | | **324 000** | 230 |

*Source: BRLi financial model for SVIP*

The same approach as per the staff and labour cost has been used to define the operating cost.

*Table 5-8: The operating costs per year*

| | Number | Annual Cost (USD) | Total | Total (M.MK) |
|---|---|---|---|---|
| Renting for offices | 1 | 18 000 | 18 000 | 13 |
| Renting for machinery | 12 | 2 000 | 24 000 | 17 |
| Insurances | 3 | 1 500 | 4 500 | 3 |
| Electricity, water, etc | 12 | 500 | 6 000 | 4 |
| Fuel, maintenance of vehicles | 3 | 3 600 | 10 800 | 8 |
| Stationary (including for customer invoicing) | 0 | 12 000 | - | - |
| Small equipment | 12 | 1 000 | 12 000 | 9 |
| Contingencies (25%) | | | 18 825 | 13 |
| **Total** | | | **94 125** | 67 |

*Source: BRLi financial model for SVIP*

The maintenance costs have been defined using ratios of maintenance (percentages of the investment cost) provided by the TFS.

*Table 5-9: Maintenance ratio*

| | | Project with illovo canal | | | Project with illovo pipe | | |
|---|---|---|---|---|---|---|---|
| **Phase 1** | | **invest** | **%0&M** | **Annual O&M estimation (USD)** | **invest** | **%0&M** | **Annual O&M estimation (USD)** |
| Inlet | USD | 4 000 000 | 2% | 80 000 | 4 000 000 | 2% | 80 000 |
| Feeder | USD | 33 100 000 | 1% | 331 000 | 33 100 000 | 1% | 331 000 |
| PHASE I<br>ZONE I-1 (canal option for Kasinthula / Phata) | | | | | | | |
| Branch I1 | USD | 300 520 | 1% | 3 005 | 300 520 | 1% | |
| Branch I2 - partie 1 | USD | 1 247 569 | 1% | 12 476 | 1 247 569 | 1% | 12 476 |
| Branch I2 - partie 2 | USD | 486 745 | 1% | 4 867 | 486 745 | 1% | 4 867 |
| Branch I3 | USD | 895 588 | 1% | 8 956 | 895 588 | 1% | 8 956 |
| Branch I4 | USD | 524 559 | 1% | 5 246 | 524 559 | 1% | 5 246 |
| Branch I5 | USD | 245 789 | 1% | 2 458 | 245 789 | 1% | 2 458 |
| Secondary + Tertiary canals | USD | 9 780 000 | 0% | 0 | 9 780 000 | 0% | 0 |
| Infield surface | USD | 44 310 000 | 0% | 0 | 44 310 000 | 0% | 0 |
| Infield drainage and road | USD | 11 080 000 | 0% | 0 | 11 080 000 | 0% | 0 |
| ZONE I-2 (canal option) | | | | | | | |
| Illovo canal | USD | 5 900 000 | 1% | 59 000 | 34 600 000 | 1% | 346 000 |
| ZONE A | | | | | | | |
| Bangula canal A | USD | 7 800 000 | 1% | 78 000 | 7 800 000 | 1% | 78 000 |
| Zone A canal (siphon) | USD | 11 600 000 | 2% | 232 000 | 11 600 000 | 2% | 232 000 |
| Branch A1 | USD | 49 471 | 1% | 495 | 49 471 | 1% | 495 |
| Branch A2 | USD | 377 426 | 1% | 3 774 | 377 426 | 1% | 3 774 |
| Branch A3 | USD | 315 446 | 1% | 3 154 | 315 446 | 1% | 3 154 |
| Branch A4 | USD | 355 819 | 1% | 3 558 | 355 819 | 1% | 3 558 |
| Branch A5 | USD | 1 001 353 | 1% | 10 014 | 1 001 353 | 1% | 10 014 |
| Secondary + Tertiary canals | USD | 7 270 000 | 0% | 0 | 7 270 000 | 0% | 0 |
| Infield surface | USD | 32 940 000 | 0% | 0 | 32 940 000 | 0% | 0 |
| Infield drainage and road | USD | 8 240 000 | 0% | 0 | 8 240 000 | 0% | 0 |
| **TOTAL INFRASTRUCTURE** | **USD** | **181 820 284** | 0 | **838 003** | **210 520 284** | 0 | **1 121 998** |
| Contengency (20% of direct cost) | USD | 36 364 057 | 0 | 0 | 42 104 057 | 0 | 0 |
| Consultant (6% of direct cost) | USD | 10 909 217 | 0 | 0 | 12 631 217 | 0 | 0 |
| **TOTAL PROJECT** | **USD** | **229 093 558** | | **838 003** | **265 255 558** | | **1 121 998** |

*Source: BRLi financial model for SVIP*

Because of the type of water users that might be proposed on the new land irrigated on phase 1(farmers organised into trust), we have considered that each client will operate and maintain its own infrastructures at the tertiary and field level. No O&M rate has then been proposed for those infrastructures.

The detail structure of the WSP and the task of each member as well as the equipment and materiel required would be describe later by the bidder during the bidding process. It can be used as a criterion of selection. For short period PPP contract, such as Management contract, the Service Provider doesn't have much interest in having heavy structures and lot of equipment; it will usually prefer subcontracting with local firm for the technical works, which is relevant from an economic point of view.

The management costs have been estimated for the Management contract option and the lease and affermage option. They have been estimated as a percentage of the O&M cost. In the options with contract management, the management costs are lower than in the case of lease or affermage contract. The main reason is that in the case of lease/affermage contract the risk (commercial risk) is supported by the scheme operator and is higher than in the case of management contract (scheme operator paid directly by the Public Authority). As the private sector is bearing more risk, his expected profit will be higher in the case of a lease/affermage contract (operator's margin estimated at 15% of the total O&M costs) than in a management contract (operator's margin estimated at 10% of the total O&M costs).

In the case of concession, the margin of the operator will be directly linked to the profit generated by the whole scheme and will have to integrate the risk on private investment.

### 5.1.4 Other Costs

The other costs are linked to (i) amortization of the part of investment made by the private sector (when private sector participates to capital cost); (ii) the constitution of a renewal fund; (iii) the payment of the water right to the river basin authority, (iv) the lease fees for the lease and affermage contract and (v) the debt service of the private sector for the concession contract.

The calculation of the amortization charge has been already explained in the part related to CAPEX.

The renewal fund has been estimated as a percentage of the water sell incomes. The level of contribution to the renewal fund can vary from case to case according to the profitability of the scheme. In the present model, it is assumed that between 0.5%/year to 2% of the water sale incomes will go for the renewal fund.

The payment of the water right river basin authority has been taken as from a recent report about the Establishment of National Water Resource Authority. An assumption of around 0.14 USD/1000m$^3$ was used, which represents today around 10 MK/1000m$^3$.

*Table 5-10: Water abstraction fees calculations – Cost (Rate)*

| Consumptive water use rates | | Non-consumptive water use rates | |
|---|---|---|---|
| **Abstraction amount** | **Rate** | **Abstraction amount** | **Rate** |
| First 500,000 m$^3$ | MKW 2.50 per 1,000 m$^3$/day | First 500,000 m$^3$ | MKW 2.50 per 10,000 m$^3$/day |
| Next 500,000 m$^3$ | MKW 2.50 per 500 m$^3$/day | Next 500,000 m$^3$ | MKW 2.50 per 5000 m$^3$/day |
| In excess of 1,000,000 m$^3$ | MKW 2.50 per 250 m$^3$/day | In excess of 1,000,000 m$^3$ | MKW 2.50 per 2500 m$^3$/day |

*Source: Establishement of the national Water Ressources Authority*

The lease fees can vary according to the type of contract but in the financial model, the assumption is that the annual lease fees will be at least 1 %/year of the investment cost of the public Authority.

The financial costs (debt service for private loan) consist of the capital repayment and financial interest. The assumption is that the Private operator will make a loan in USD (to avoid the risk of inflation) with an interest rate of 4.5%, a maturity of 15 years and a grace period of 3 years (duration of the construction).

The following table provide for each PPP option the NPV of the other costs taken into account in the financial model.

*Table 5-11: NPV of other costs*

| | | NPV of Amortization charges (USD) | NPV of renewal fund (USD) | NPV of fees for Shire river basin water rigth (USD) | NPV of lease fees (USD) | NPV of private sector debt service (USD) |
|---|---|---|---|---|---|---|
| Option 1 of WPA | **Management contract** | 0 | 530 369 | 24 165 | | |
| | **Lease contract** | 61 080 | 773 488 | 35 746 | 13 203 639 | |
| | **Affermage contract** | 61 080 | 773 488 | 35 746 | 0 | |
| | **Concession (Illovo canal)** | 11 267 967 | 1 024 562 | 49 129 | | 32 395 896 |
| | **Concession (Illovo pipe)** | 16 211 851 | 1 293 619 | 49 129 | | 46 609 779 |
| Option 2 of WPA | **Management contract** | 0 | 182 877 | 24 165 | | |
| | **Lease contract** | 61 080 | 264 615 | 35 746 | 440 121 | |
| | **Affermage contract** | 61 080 | 264 615 | 35 746 | 0 | |
| | **Concession (Illovo canal)** | 2 067 847 | 352 283 | 49 129 | | 5 945 149 |
| | **Concession (Illovo pipe)** | 6 618 229 | 621 340 | 49 129 | | 19 027 696 |
| Option 3 of WPA | **Management contract** | 0 | 137 814 | 24 165 | | |
| | **Lease contract** | 61 080 | 198 474 | 35 746 | 440 121 | |
| | **Affermage contract** | 61 080 | 198 474 | 35 746 | 0 | |
| | **Concession (Illovo canal)** | 762 424 | 263 779 | 49 129 | | 2 192 002 |
| | **Concession (Illovo pipe)** | 5 290 392 | 532 836 | 49 129 | | 15 210 106 |

*Source: BRLi financial model for SVIP*

It is important to remind that the duration of the contract change from one option to another, which partly explain the variation of the NPV of the various items.

### 5.1.5 Outputs of the financial model

As until now no decision has been taken regarding the PPP option to set up the financial model deals with the different types of PPP arrangement proposed. The outputs of the model are:

- Financial data such as:
  - (1) Amount of total investment;
  - (2) Amount of private loan and NPV of the private debt service
  - (3) Amount of private equity;
  - (4) Amount of public loan required and NPV of the public debt service;
- Financial indicators for concession:
  - (5) Debt service Cover ratio (for concession contract only);
  - (6) FNPV Cash flow;
  - (7) FNPV Private Operator Gross benefit over 25 years;
  - (8) FIRR of Gross benefit with full taxes exoneration (for concession contract only);
  - (9) FNPV Private Operator Net benefit over 25 years;
  - (10) FIRR of Net benefit with full taxes exoneration (for concession contract only);
  - (11) FNPV provision for depreciation cost (amortization);
  - (12) FNPV of renewal fund (25 year without bank interest);
  - (13) FIRR on equity (for concession contract only).

- Financial indicators for Management contract and Lease/affermage contracts

(14) FNPV Scheme cash flow: it corresponds to the incomes, less O&M charges, less lease fees and less water right fees (Shire river)

(15) FNPV Private Operator Gross benefit over 10/15 years: margin of the Service provider (% of the O&M cost);

(16) FNPV Private Operator Net benefit over 10/15 years: margin of the service provider (% of the O&M cost) after profit taxes;

(17) FNPV provision for depreciation cost (15 years): it is the amortization charge of private investment over the contract period;

(18) FNPV renewal fund (15/10 years) without interest rate: it is the constitution of a fund for renewing the infrastructure/ O&M assets when required;

(19) FNPV Public Authority revenues. The Public Authority revenues provide information on the revenue available for the public Authority (i) to pay the public loan debt service in the case of management contract/lease/affermage or (ii) to make provision for future rehabilitation/extension of the scheme. It corresponds to the lease fees, plus the profit taxes from the private operator benefits, plus the renewal fund constituted, plus according to the contract, a part of the additional potential profit generated by the irrigation scheme (affermage).

(20) FNPV contract cost (only for management contract): it corresponds to the private sector gross benefit, plus the renewal fund.

As mentioned above some of the indicators are only relevant for a certain type of PPP arrangement. For example, the debt service cover ratio is relevant only for PPP with private sector funding function, which is not the case for the management contract or a lease/affermage contract. On the other hand, the FNPV PPP contract cost for public Authority will be relevant only for service provider contract such as Management contract.

ISC required according to the type of contract WPA set up. A specific section of the model is dedicated to the estimation of the ISC for the various water users. The level and the structure of the ISC are described in the section 5.2.

The outputs of the financial model re PPP arrangement are provided in the following tables.

*Table 5-12: Financial model outputs for concession agreement (Illovo canal)*

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Concession (canal)** |
| Option of WPA | |
| Duration of the contract year | - |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 2.6 |
| Tariff new land I1 (USD/ha) | 721 |
| Tariff area A (USD/1000m3) | 3.8 |
| Tariff area A (USD/ha) | 698 |
| **Financial plan** | |
| Total investment (M.USD) | 241.3 |
| Private loan (M.USD) | 35.17 |
| Equity (M.USD) | 6.21 |
| NPV of private sector debt service | 32.40 |
| Public Loan required (M.USD) | **199.88** |
| NPV of public sector debt service | 192.39 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **1.67** |
| **FNPV Cash flow** | **20** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **7.68** |
| **FIRR gross benefit** | **27%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **4.60** |
| **FIRR net benefit** | **22%** |
| **FIRR return on equity** | **12%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **1** |
| ***annual % of incomes*** | **2%** |

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Concession (canal)** |
| Option of WPA | |
| Duration of the contract year | - |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 1.7 |
| Tariff new land I1 (USD/ha) | 55 |
| Tariff area A (USD/1000m3) | 2.9 |
| Tariff area A (USD/ha) | 109 |
| **Financial plan** | |
| Total investment (M.USD) | 241.3 |
| Private loan (M.USD) | 6.45 |
| Equity (M.USD) | 1.14 |
| NPV of private sector debt service | 5.95 |
| Public Loan required (M.USD) | **233.67** |
| NPV of public sector debt service | 224.90 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **1.78** |
| **FNPV Cash flow** | **4** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **1.34** |
| **FIRR gross benefit** | **22%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **0.71** |
| **FIRR net benefit** | **17%** |
| **FIRR return on equity** | **12%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **0** |
| ***annual % of incomes*** | **2%** |

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Concession (canal)** |
| Option of WPA | |
| Duration of the contract year | - |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 1.8 |
| Tariff other trust (USD/ha) | 62 |
| Tariff new land I1 (USD/1000m3) | 0.8 |
| Tariff new land I1 (USD/ha) | 11 |
| Tariff area A (USD/1000m3) | 2.0 |
| Tariff area A (USD/ha) | 64 |
| **Financial plan** | |
| Total investment (M.USD) | 241.3 |
| Private loan (M.USD) | 2.38 |
| Equity (M.USD) | 0.42 |
| NPV of private sector debt service | 2.19 |
| Public Loan required (M.USD) | **238.46** |
| NPV of public sector debt service | 229.52 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **2.18** |
| **FNPV Cash flow** | **2** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **0.71** |
| **FIRR gross benefit** | **21%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **0.34** |
| **FIRR net benefit** | **16%** |
| **FIRR return on equity** | **15%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **0** |
| | **2%** |

*Table 5-13: Financial model outputs for concession agreement (Illovo pipe)*

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Concession (pipe)** |
| Option of WPA | |
| Duration of the contract year | **25** |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 5.0 |
| Tariff Illovo (USD/ha) | 222 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 2.6 |
| Tariff new land I1 (USD/ha) | 721 |
| Tariff area A (USD/1000m3) | 3.8 |
| Tariff area A (USD/ha) | 698 |
| **Financial plan** | |
| Total investment (M.USD) | 279.5 |
| Private loan (M.USD) | 50.60 |
| Equity (M.USD) | 8.93 |
| NPV of private sector debt service | 46.61 |
| Public Loan required (M.USD) | **219.95** |
| NPV of public sector debt service | 211.70 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **1.64** |
| **FNPV Cash flow** | **25** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **7.47** |
| **FIRR gross benefit** | **22%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **4.24** |
| **FIRR net benefit** | **18%** |
| **FIRR return on equity** | **12%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **1** |
| ***annual % of incomes*** | **2%** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Concession (pipe)** |
| Option of WPA | |
| Duration of the contract year | **25** |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 5.0 |
| Tariff Illovo (USD/ha) | 222 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 1.7 |
| Tariff new land I1 (USD/ha) | 55 |
| Tariff area A (USD/1000m3) | 2.9 |
| Tariff area A (USD/ha) | 109 |
| **Financial plan** | |
| Total investment (M.USD) | 279.5 |
| Private loan (M.USD) | 20.66 |
| Equity (M.USD) | 3.65 |
| NPV of private sector debt service | 19.03 |
| Public Loan required (M.USD) | **255.18** |
| NPV of public sector debt service | 245.61 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **1.58** |
| **FNPV Cash flow** | **9** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **2.20** |
| **FIRR gross benefit** | **18%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **1.17** |
| **FIRR net benefit** | **15%** |
| **FIRR return on equity** | **16%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **1** |
| ***annual % of incomes*** | **2%** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Concession (pipe)** |
| Option of WPA | |
| Duration of the contract year | **25** |
| Equiped areas (ha) | *21 409* |
| Tariff Illovo (USD/1000m3) | 5.0 |
| Tariff Illovo (USD/ha) | 222 |
| Tariff other trust (USD/1000m3) | 1.8 |
| Tariff other trust (USD/ha) | 62 |
| Tariff new land I1 (USD/1000m3) | 0.8 |
| Tariff new land I1 (USD/ha) | 11 |
| Tariff area A (USD/1000m3) | 2.0 |
| Tariff area A (USD/ha) | 64 |
| **Financial plan** | |
| Total investment (M.USD) | 279.5 |
| Private loan (M.USD) | 16.51 |
| Equity (M.USD) | 2.91 |
| NPV of private sector debt service | 15.21 |
| Public Loan required (M.USD) | **260.05** |
| NPV of public sector debt service | 250.30 |
| Users participation required | |
| **Output** | |
| **Average Cover cash flow debt service ratio** | **1.57** |
| **FNPV Cash flow** | **7** |
| **FNPV Private Operator Gross benefit over 25 years (M. USD)** | **1.63** |
| **FIRR gross benefit** | **18%** |
| **FNPV Private Operator Net benefit over 25 years (M. USD)** | **0.86** |
| **FIRR net benefit** | **15%** |
| **FIRR return on equity** | **21%** |
| **FNPV renewal fund (25 years, without bank interest) (M. USD)** | **1** |
| ***annual % of incomes*** | **2%** |

*Table 5-14: Financial model outputs for management contract (Illovo canal)*

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Manag.contract** |
| Option of WPA | |
| Duration of the contract year | **10** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 2.6 |
| Tariff new land I1 (USD/ha) | 721 |
| Tariff area A (USD/1000m3) | 3.8 |
| Tariff area A (USD/ha) | 698 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.00 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **241.26** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 232.21 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **19.6** |
| **FNPV Private Operator Gross benefit over 10 years (M. USD)** | **0.5** |
| **FNPV Private Operator net benefit over 10 years (M. USD)** | **0.4** |
| **FNPV provision for depreciation cost (10 years) (M. USD)** | **0.0** |
| **FNPV renewal fund (10 years, without bank interest) (M. USD)** | **0.6** |
| **FNPV PPP contract cost for the Publ. Auth. (10 years) (M.USD** | **1.1** |
| **FNPV Public Authority revenues (10 years W/O interest) (M. USD)** | **19.0** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Manag.contract** |
| Option of WPA | |
| Duration of the contract year | **10** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 1.7 |
| Tariff new land I1 (USD/ha) | 55 |
| Tariff area A (USD/1000m3) | 2.9 |
| Tariff area A (USD/ha) | 109 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.00 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **241.26** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 232.21 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **3.1** |
| **FNPV Private Operator Gross benefit over 10 years (M. USD)** | **0.5** |
| **FNPV Private Operator net benefit over 10 years (M. USD)** | **0.4** |
| **FNPV provision for depreciation cost (10 years) (M. USD)** | **0.0** |
| **FNPV renewal fund (10 years, without bank interest) (M. USD)** | **0.2** |
| **FNPV PPP contract cost for the Publ. Auth. (10 years) (M.USD** | **0.7** |
| **FNPV Public Authority revenues (10 years W/O interest) (M. USD)** | **2.8** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Manag.contract** |
| Option of WPA | |
| Duration of the contract year | **10** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 1.8 |
| Tariff other trust (USD/ha) | 62 |
| Tariff new land I1 (USD/1000m3) | 0.8 |
| Tariff new land I1 (USD/ha) | 11 |
| Tariff area A (USD/1000m3) | 2.0 |
| Tariff area A (USD/ha) | 64 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.00 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **241.26** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 232.21 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **1.0** |
| **FNPV Private Operator Gross benefit over 10 years (M. USD)** | **0.5** |
| **FNPV Private Operator net benefit over 10 years (M. USD)** | **0.4** |
| **FNPV provision for depreciation cost (10 years) (M. USD)** | **0.0** |
| **FNPV renewal fund (10 years, without bank interest) (M. USD)** | **0.2** |
| **FNPV PPP contract cost for the Publ. Auth. (10 years) (M.USD** | **0.7** |
| **FNPV Public Authority revenues (10 years W/O interest) (M. USD)** | **0.7** |

Prof

*Table 5-15: Financial model outputs for Lease contract (Illovo canal)*

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Lease contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 2.6 |
| Tariff new land I1 (USD/ha) | 721 |
| Tariff area A (USD/1000m3) | 3.8 |
| Tariff area A (USD/ha) | 698 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **15.6** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **14.7** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **9.2** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.9** |
| ***annual % of incomes*** | **2.0%** |
| **FNPV of the lease fees in M. USD (15 years)** | **10.3** |
| ***annual % of public investment*** | **0.90%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **19.5** |

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Lease contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 1.7 |
| Tariff new land I1 (USD/ha) | 55 |
| Tariff area A (USD/1000m3) | 2.9 |
| Tariff area A (USD/ha) | 109 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **4.2** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **3.8** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **2.5** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.3** |
| ***annual % of incomes*** | **2.0%** |
| **FNPV of the lease fees in M. USD (15 years)** | **0.3** |
| ***annual % of public investment*** | **0.03%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **2.1** |

| **Project name** | **SVIP phase I** |
|---|---|
| Type of PPP contract | **Lease contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| Equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 1.8 |
| Tariff other trust (USD/ha) | 62 |
| Tariff new land I1 (USD/1000m3) | 0.8 |
| Tariff new land I1 (USD/ha) | 11 |
| Tariff area A (USD/1000m3) | 2.0 |
| Tariff area A (USD/ha) | 64 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **1.0** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **0.7** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **0.3** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.2** |
| ***annual % of incomes*** | **2%** |
| **FNPV of the lease fees in M. USD (15 years)** | **0.3** |
| ***annual % of public investment*** | **0.03%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **1.1** |

*Table 5-16: Financial model outputs for affermage contract (Illovo canal)*

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Affermage contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 2.6 |
| Tariff new land I1 (USD/ha) | 721 |
| Tariff area A (USD/1000m3) | 3.8 |
| Tariff area A (USD/ha) | 698 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **28.8** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **14.7** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **10.3** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.9** |
| ***annual % of incomes*** | **2%** |
| **FNPV of the lease fees in M. USD (15 years)** | **9.5** |
| ***mini annual fee % of public investment*** | **0%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **19.0** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Affermage contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 2.8 |
| Tariff other trust (USD/ha) | 106 |
| Tariff new land I1 (USD/1000m3) | 1.7 |
| Tariff new land I1 (USD/ha) | 55 |
| Tariff area A (USD/1000m3) | 2.9 |
| Tariff area A (USD/ha) | 109 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **4.6** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **2.9** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **2.0** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.3** |
| ***annual % of incomes*** | **2%** |
| **FNPV of the lease fees in M. USD (15 years)** | **1.4** |
| ***mini annual fee % of public investment*** | **0%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **3.1** |

| Project name | SVIP phase I |
|---|---|
| Type of PPP contract | **Affermage contract** |
| Option of WPA | |
| Duration of the contract year | **15** |
| equiped areas (ha) | 21 409 |
| Tariff Illovo (USD/1000m3) | 2.2 |
| Tariff Illovo (USD/ha) | 75 |
| Tariff other trust (USD/1000m3) | 1.8 |
| Tariff other trust (USD/ha) | 62 |
| Tariff new land I1 (USD/1000m3) | 0.8 |
| Tariff new land I1 (USD/ha) | 11 |
| Tariff area A (USD/1000m3) | 2.0 |
| Tariff area A (USD/ha) | 64 |
| **Financial plan** | |
| Total investment (M.USD) | 241 |
| Private loan (M.USD) | 0.00 |
| Equity (M.USD) | 0.29 |
| NPV of private sector debt service | 0.00 |
| Public Loan required (M.USD) | **240.97** |
| Equity (M.USD) | 0.00 |
| NPV of Public debt service (M.USD) | 231.93 |
| Users participation required | |
| **Output** | |
| **FNPV Scheme cash flow (M. USD)** | **1.4** |
| **FNPV Private Operator Gross benefit over 15years (M. USD)** | **1.3** |
| **FNPV Private Operator net benefit over 15years (M. USD)** | **0.9** |
| **FNPV provision for depreciation cost (15 years) (M. USD)** | **0.1** |
| **FNPV renewal fund (15 years, without bank interest) (M. USD)** | **0.2** |
| ***annual % of incomes*** | **0.0** |
| **FNPV of the lease fees in M. USD (15 years)** | **0.3** |
| ***mini annual fee % of public investment*** | **0%** |
| **FNPV PPP contract cost for the Publ. Auth. (15 years) (M.USD** | |
| **FNPV Public Authority revenues (15 years W/O interest) (M. USD)** | **1.1** |

## Synthesis

In the case of concession, to balance the model and to determine the level of funding participation of each parties the following criteria have been defined:

- A cover cash flow debt service ratio around 1.25,
- A FIRR above 14%,
- A FIRR return on equity above 12%.
- For the other contract it has been checked that the FNPV of the cash flow generated by the scheme will be at least high enough to pay:

  (1) For the management contract: the contract cost with private sector; the renewal fund and the Water right fees for shire Valley;

  (2) For Affermage contract: the private sector profit ; the renewal fund and the Water right fees for shire Valley;

  (3) For the Lease contract: the private sector profit ; the public sector lease ; the renewal fund and the Water right fees for shire Valley.

Between the concession arrangements, the management contract, the lease contract and the affermage contract, the financial model shows that:

**In terms of public investment:**

- The concession is better for the Public Authority as it reduces its investment cost and increases the participation of the private partner in the initial investment;
- For the concession the lower is the level of water fees (tariff option 1;2;3) lower will be the contribution of the private sector. In the model it has been set up on the assumption that 15% of the private sector financial contribution will be paid through equity. This assumption could be adapted according to the case.

*Table 5-17: Private contribution to the investment cost*

| | | Project with Illovo canal | Project with Illovo pipe |
|---|---|---|---|
| **Option 1 of WPA** | **Total Investment (M.USD)** | **241.26** | **279.48** |
| | Public Loan required (M.USD) | 199.88 | 219.95 |
| | Private loan (M.USD) | 35.17 | 50.60 |
| | Private equity (M.USD) | 6.21 | 8.93 |
| | *% of private financial contribution* | *17%* | *21%* |
| **Option 2 of WPA** | **Total Investment (M.USD)** | **241.26** | **279.48** |
| | Public Loan required (M.USD) | 233.67 | 255.18 |
| | Private loan (M.USD) | 6.45 | 20.66 |
| | Private equity (M.USD) | 1.14 | 3.65 |
| | *% of private financial contribution* | *3%* | *9%* |
| **Option 3 of WPA** | **Total Investment (M.USD)** | **241.26** | **279.48** |
| | Public Loan required (M.USD) | 238.46 | 260.05 |
| | Private loan (M.USD) | 2.38 | 16.51 |
| | Private equity (M.USD) | 0.42 | 2.91 |
| | *% of private financial contribution* | *1%* | *7%* |

*Source: BRLi financial model for SVIP*

The contribution of the private sector will be between 18% and 1% of the total investment cost for the project with Illovo canal and between 21% and 7% for the project with Illovo pipe:

- The lease and the Affermage are better than the management contract as the private sector will finance himself the O&M assets;
- The management contract is the less interesting option.

**In terms of renewal fund**

The variation of the provision for the renewal fund according to the option is mainly due to the duration of the contract. In each case the assumption set is that 2% of the incomes will be used for this renewal fund. In the Management / Lease / Affermage contract the renewal fund will be managed by the Public authority, whereas in the concession, the private sector will be managing it.

**In terms of private sector and public sector remuneration**

Only the lease contract guarantees a minimum remuneration for the Public authority. In the affermage contract the remuneration of the public authority will depend on the performance of the scheme as well as in the management contract. It is important to remind that in the lease and in the affermage the sharing of profits between both parties can be adjusted later on through various parameters (variation of the lease fees for the lease contract or variation rule of profit sharing for the affermage).

*Table 5-18: Estimation of Public sector NPV incomes according to the option*

| | Public sector NPV revenu | |
|---|---|---|
| **Option 1 of WPA** | Concession illovo canal (M.USD) | |
| | Concession illovo pipe (M.USD) | |
| | Management contract (M.USD) | 18.96 |
| | Lease contract (M.USD) | 19.50 |
| | Affermage contract (M.USD) | 19.03 |
| **Option 2 of WPA** | Concession illovo canal (M.USD) | |
| | Concession illovo pipe (M.USD) | |
| | Management contract (M.USD) | 2.80 |
| | Lease contract (M.USD) | 2.06 |
| | Affermage contract (M.USD) | *3.14* |
| **Option 3 of WPA** | Concession illovo canal (M.USD) | |
| | Concession illovo pipe (M.USD) | |
| | Management contract (M.USD) | 0.68 |
| | Lease contract (M.USD) | 1.06 |
| | Affermage contract (M.USD) | *1.06* |

*Source: BRLi financial model for SVIP*

The financial model has set up assumptions in order to guarantee a minimum remuneration for the private sector at least in the case of management contract, lease contract and affermage. In the concession the private sector supports all the commercial risks it is then not possible to guarantee a minimum remuneration.

*Table 5-19: Estimation of private sector net benefit according to the option*

| | Private sector NPV net benefit | |
|---|---|---|
| **Option 1 of WPA** | Concession illovo canal (M.USD) | 4.60 |
| | Concession illovo pipe (M.USD) | 4.24 |
| | Management contract (M.USD) | 0.37 |
| | Lease contract (M.USD) | 9.22 |
| | Affermage contract (M.USD) | 10.31 |
| **Option 2 of WPA** | Concession illovo canal (M.USD) | **0.71** |
| | Concession illovo pipe (M.USD) | 1.17 |
| | Management contract (M.USD) | 0.37 |
| | Lease contract (M.USD) | 2.49 |
| | Affermage contract (M.USD) | *2.03* |
| **Option 3 of WPA** | Concession illovo canal (M.USD) | **0.34** |
| | Concession illovo pipe (M.USD) | 0.86 |
| | Management contract (M.USD) | 0.37 |
| | Lease contract (M.USD) | 0.31 |
| | Affermage contract (M.USD) | *0.94* |

*Source: BRLi financial model for SVIP*

In terms of private sector profit the affermage contract seems the best option for the private sector. In the case of Management contract, whatever the tariff option, the level of private sector net profit will be the same (10%of O&M cost).

### 5.1.6 Fiscal Sustainability

In the proposed option of concession, the Public sector contributes to the project by subsidizing the infrastructure and not by subsidizing the O&M of the scheme. In such a case the fiscal sustainability is increased as the contribution of the public authority is no more linked to life expectancy of the infrastructures.

The following table provides the capital grant in percentage for the various option in the case of concession.

*Table 5-20 Capital grant for the concession options*

| | Project with Illovo canal | Project with Illovo pipe |
|---|---|---|
| Total Investment (M.USD) | 241.3 | 279.5 |
| Public Loan required (M.USD) | 199.9 | 219.9 |
| Capital Grant % | 83% | 79% |
| Total Investment (M.USD) | 241.3 | 279.5 |
| Public Loan required (M.USD) | 233.7 | 255.2 |
| Capital Grant % | 97% | 91% |
| Total Investment (M.USD) | 241.3 | 279.5 |
| Public Loan required (M.USD) | 238.5 | 260.1 |
| Capital Grant % | 99% | 93% |

*Source: financial model BRLi*

In the case of concession as proposed, there is no need for a Public Authority annual payment to the scheme operator.

### 5.1.7 Recommendation in terms of PPP arrangement

The financial model shows that based on level of ISC proposed and with prior negotiation of WPAs with Illovo, all types of PPP arrangements could be successfully implemented.

Nevertheless, the analyse shows that the participation of the Private sector in the CAPEX might be limited (between 1% and 17% according to the level of tariff negotiated in the WPA). Even with the option 3 of the WPA, which proposed the lower level of ISC and then a participation of the private sector close to 1% of the CAPEX, the concession arrangement remain interesting considering the level of risk (operational, commercial, exchange rate risk) that is assumed by the private operator compared to a lease/ affermage or management contract.

The concession as the advantage to clearly assign the responsibility to each parties (public and private sector), which avoid overlaps responsibility that sometime can create confusion and conflict between parties. Concession Arrangement also allows to manage the whole project under one single contract (same SPV can undertake the construction works and then the O&M of the infrastructures). With the other type of arrangements (lease/management contract), different companies are usually contracted for the construction works, and for O&M of the infrastructures (with eventually the supervision of the construction work). In such case, three parties are involved in the implementation of the project (the public authority, the private sector in charge of the construction and the private sector in charge of the O&M/supervision) which might increase the risk of conflict.

In terms of incentive for the private sector, the concession is also better than the other arrangements.

If the decision is taken to assess deeper the concession option in the next phase of the project, the consultant will make the best to optimise the concession arrangement in terms of private participation's in the CAPEX.

## 5.2 IRRIGATION SERVICE CHARGE

### 5.2.1 Agricultural ISC and pricing calculation

In order to define the level of tariffs for the various water users, a specific assessment has been carried out using the costs prepared by the TFS team.

To estimate the ISC for the various options, the investment costs have been shared between the areas irrigated/water users, based on the following assumptions:

*Table 5-21: Hypotheses used for the three options of the WPA*

| | Option 1 | Option 2 | Option 3 | Option 4 (additional option) |
|---|---|---|---|---|
| **Main infrastructures (main canal and intlet)** | All water users are paying for the cost linked to the main infrastructures according to their irrigated area | All water users are paying for the cost linked to the main infrastructures according to their irrigated area | Only illovo is paying for the cost linked to the main infrastructures ( propotionally to its irrigated area) | Only illovo is paying for the cost linked to the main infrastructures ( propotionally to its irrigated area) |
| **Branches** | All water users pay for the branches required to bring the water to their area | All water users pay the branches required to bring the water to their area | All water users pay the branches required to bring the water to their area | All water users pay the branches required to bring the water to their area |
| **Secondary and tertiary infrastructures** | all the water users concerned by such infrastructures pay for it through the water tariff | The investment cost linked to secondary and tertiary infrastructures are out of the water tariff | The investment cost linked to secondary and tertiary infrastructures are out of the water tariff | all the water users concerned by such infrastructures pay for it through the water tariff |
| **infield surface** | All the water users concerned by such infrastructures pay for its through the water tariff | The investment costs linked to infield surface are out of the water tariff | The investment costs linked to infield surface are out of the water tariff | All the water users concerned by such infrastructures pay for its through the water tariff |
| **infield drain and road** | All the water users concerned by such infrastructures pay for its through the water tariff | The investment cost linked to infield surface are out of the water tariff | The investment cost linked to infield drain and road are out of the water tariff | All the water users concerned by such infrastructures pay for its through the water tariff |
| **O&M assets required (estimation BRLi)** | Shared between all water users according to irrigated area | Shared between all water users according to irrigated area | Shared between all water users according to irrigated area | Shared between all water users according to irrigated area |

*Source: financial model BRLi*

The annex 4 presents the structure of the WPA excel model linked to the PPP financial model, its parameters and results.

In this section, we are more interested in the level of tariffs to be proposed. In addition to the four options describe above, two technical options were considered. The first one is to deliver water to Illovo estates with a canal (the one presented in the technical feasibility study as Illovo canal) and with pipes (equally presented in the technical feasibility study).

The structure of the ISC proposed for each group/ water users (Illovo; existing trust; new development area zone I1 and new development area zone A) is binomial with a variable part depending on water consumption and a fixed part linked to the surface irrigated by the client. The estimation of both part of the ISC have been obtained as follow:

- Variable part (linked to water consumption): the total Net Present Value of the charges (NPV rate 10%): OPEX/renewal fund/Water right for basin authority, have been divided by the NPV estimation of the water demand (NPV rate: 10%).
- Fixe part (linked to irrigated area): The total Net Present Value of the financial cost (NPV rate 2%) has been divided by the irrigated area of each group/water users (Illovo/ existing trusts/ new development area I1/ new development area A).

The table overleaf presents the results of the simulation for each option and for each area. The fourth option which is an additional option only considered in this section is in terms of ISC quite similar to the option 1

*Table 5-22: Simulation results option 1*

| | Illovo Canal | Illovo pipe | Phata/Kasinthula/s Sande ranch | New land area I1 | Area A |
|---|---|---|---|---|---|
| Irrigated area (ha) | 9 995 | 9 995 | 2 179 | 5 020 | 4 215 |
| water demand (Mm3/an) | 214 | 214 | 47 | 114 | 96 |
| Part of inlet/feeder investment allocated to the beneficiary (000 USD2016) | 8 725 | 8 725 | 1 902 | 4 382 | 3 679 |
| Part of bangula/siphon investment allocated to the beneficiary (000 USD2016) | | | | | 3 231 |
| Investment branch (000 USD2016) | 5 900 | 34 600 | 2 630 | 1 071 | 2 100 |
| Investment second & tertiary (000 USD2016) | | | | 9 780 | 7 270 |
| Investment Land leveling (000 USD2016) | | | | 44 310 | 32 940 |
| Investment roads & drainage (000 USD2016) | | | | 11 080 | 8 240 |
| O&M cost (% of planned investment allocated) (000 USD2019/year) | 268 | 573 | 73 | 115 | 163 |
| Renewal fund and big repair provision (% of considered investment allocated) (000 USD2019/year) | 96 | 288 | 30 | 124 | 125 |
| National Water Resources Authority water abstraction fees (000 USD2016/year) | 3 | 3 | 1 | 2 | 1 |
| Proposed price: variable part (USD2016/m3) | 0.002 | 0.005 | 0.003 | 0.003 | 0.004 |
| Proposed price: fix part (USD2016/ha) | 75 | 222 | 106 | 721 | 698 |
| NPV of the total amount paid on 25 years (000 USD) | 7 907 | 21 360 | 2 354 | 23 928 | 20 327 |

*Table 5-23: Simulation results option 2*

| | Illovo Canal | Illovo pipe | Phata/kasinthula/sande ranch | New land area I1 | Area A |
|---|---|---|---|---|---|
| Irrigated area (ha) | 9 995 | 9 995 | 2 179 | 5 020 | 4 215 |
| water demand (Mm3/an) | 214 | 214 | 47 | 114 | 96 |
| Part of inlet/feeder investment allocated to the beneficiary (000 USD2016) | 8 725 | 8 725 | 1 902 | 4 382 | 3 679 |
| Part of bangula/siphon investment allocated to the beneficiary (000 USD2016) | | | | | 3 231 |
| Investment branch (000 USD2016) | 5 900 | 34 600 | 2 630 | 1 071 | 2 100 |
| Investment second & tertiary (000 USD2016) | | | | 0 | 0 |
| Investment Land leveling (000 USD2016) | | | | 0 | 0 |
| Investment roads & drainage (000 USD2016) | | | | 0 | 0 |
| O&M cost (% of planned investment allocated) (000 USD2019/year) | 268 | 573 | 73 | 115 | 163 |
| Renewal fund and big repair provision (% of considered investment allocated) (000 USD2019/year) | 96 | 288 | 30 | 36 | 59 |
| National Water Resources Authority water abstraction fees (000 USD2016/year) | 3 | 3 | 1 | 2 | 1 |
| Proposed price: variable part (USD2016/m3) | 0.002 | 0.005 | 0.003 | 0.002 | 0.003 |
| Proposed price: fix part (USD2016/ha) | 75 | 222 | 106 | 55 | 109 |
| NPV of the total amount paid on 25 years (000 USD) | 7 907 | 21 360 | 2 354 | 3 085 | 4 831 |

*Table 5-24: Simulation results option 3*

| | Illovo Canal | Illovo pipe | Phata/kasinthula/sande ranch | New land area I1 | Area A |
|---|---|---|---|---|---|
| Irrigated area (ha) | 9 995 | 9 995 | 2 179 | 5 020 | 4 215 |
| water demand (Mm3/an) | 214 | 214 | 47 | 114 | 96 |
| Part of inlet/feeder investment allocated to the beneficiary (000 USD2016) | 8 725 | 8 725 | 0 | 0 | 0 |
| Part of bangula/siphon investment allocated to the beneficiary (000 USD2016) | | | | | 3 231 |
| Investment branch (000 USD2016) | 5 900 | 34 600 | 2 630 | 1 071 | 2 100 |
| Investment second & tertiary (000 USD2016) | | | | 0 | 0 |
| Investment Land leveling (000 USD2016) | | | | 0 | 0 |
| Investment roads & drainage (000 USD2016) | | | | 0 | 0 |
| O&M cost (% of planned investment allocated) (000 USD2019/year) | 268 | 573 | 51 | 64 | 121 |
| Renewal fund and big repair provision (% of planned investment allocated) (000 USD2019/year) | 96 | 288 | 18 | 7 | 35 |
| National Water Resources Authority water abstraction fees (000 USD2016/year) | 3 | 3 | 1 | 2 | 1 |
| Proposed price: variable part (USD2016/m3) | 0.002 | 0.005 | 0.002 | 0.001 | 0.002 |
| Proposed price: fix part (USD2016/ha) | 75 | 222 | 62 | 11 | 65 |
| NPV of the total amount paid on 25 years (000 USD) | 7 907 | 21 360 | 1 457 | 1 019 | 3 124 |

*Table 5-25: Simulation results option 4*

| | Illovo Canal | Illovo pipe | Phata/kasinthula/sande ranch | New land area I1 | Area A |
|---|---|---|---|---|---|
| Irrigated area (ha) | 9 995 | 9 995 | 2 179 | 5 020 | 4 215 |
| water demand (Mm3/an) | 214 | 214 | 47 | 114 | 96 |
| Part of inlet/feeder investissement allocated to the beneficiary (000 USD2016) | 8 725 | 8 725 | 0 | 0 | 0 |
| Part of bangula/siphon investissement allocated to the beneficiary (000 USD2016) | | | | | 3 231 |
| Investissement branch (000 USD2016) | 5 900 | 34 600 | 2 630 | 1 071 | 2 100 |
| Investissement second & tertiary (000 USD2016) | | | | 9 780 | 7 270 |
| Investissement Land leveling (000 USD2016) | | | | 44 310 | 32 940 |
| Investissement roads & drainage (000 USD2016) | | | | 11 080 | 8 240 |
| O&M cost (% of considerated investment allocated) (000 USD2019/year) | 268 | 573 | 51 | 64 | 120 |
| Renewal fund and big repare provision (% of considerated investment allocated) (000 USD2019/year) | 96 | 288 | 18 | 95 | 101 |
| National Water Resources Authority water abstraction fees (000 USD2016/year) | 3 | 3 | 1 | 2 | 1 |
| Proposed price: variable part (USD2016/m3) | 0.002 | 0.005 | 0.002 | 0.002 | 0.003 |
| Proposed price: fix part (USD2016/ha) | 75 | 222 | 62 | 677 | 654 |
| NPV of the total amount paid on 25 years (000 USD) | 7 907 | 21 360 | 1 457 | 21 862 | 18 592 |

*Table 5-26: Simulation results – synthesis of options 1 to 4*

| | Illovo Canal | Illovo pipe | Phata/kasinthula /sande ranch | New land area I1 | Area A |
|---|---|---|---|---|---|
| Option 1 | | | | | |
| Proposed price: variable part (USD2016/m3) | **0.002** | **0.005** | **0.003** | **0.003** | **0.004** |
| Proposed price: fix part (USD2016/ha) | **75** | **222** | **106** | **721** | **698** |
| NPV of the total amount paid on 25 years (000 USD) | **7 907** | **21 360** | **2 354** | **23 928** | **20 327** |
| Option 2 | | | | | |
| Proposed price: variable part (USD2016/m3) | **0.002** | **0.005** | **0.003** | **0.002** | **0.003** |
| Proposed price: fix part (USD2016/ha) | **75** | **222** | **106** | **55** | **109** |
| NPV of the total amount paid on 25 years (000 USD) | **7 907** | **21 360** | **2 354** | **3 085** | **4 831** |
| Option 3 | | | | | |
| Proposed price: variable part (USD2016/m3) | **0.002** | **0.005** | **0.002** | **0.001** | **0.002** |
| Proposed price: fix part (USD2016/ha) | **75** | **222** | **62** | **11** | **65** |
| NPV of the total amount paid on 25 years (000 USD) | **7 907** | **21 360** | **1 457** | **1 019** | **3 124** |
| Option 4 | | | | | |
| Proposed price: variable part (USD2016/m3) | **0.002** | **0.005** | **0.002** | **0.002** | **0.003** |
| Proposed price: fix part (USD2016/ha) | **75** | **222** | **62** | **677** | **654** |
| NPV of the total amount paid on 25 years (000 USD) | **7 907** | **21 360** | **1 457** | **21 862** | **18 592** |

Among the four options, the level of tariff proposed by the option 3 seems to be the most realistic for the various stakeholders. In this option Illovo state is paying a ISC higher than the others water users based on the hypothesis that part of the investment costs required to provide them with water will be subject to subsidies (which is not the case for Illovo state). However, the best option need to be discussed and a decision needs to be taken by the public authority and then the WPA will have to be negotiated with the concerned parties.

In other terms, the result of the tariff assessment should allow the public authority to agree on the terms of the WPA with Illovo, Kasinthula / Phata / Sandee ranch, which would mean that we would have crossed a very important milestone in view of realizing the PPP project for the SVIP.

## 5.2.2 Drinking water tariff

This section is dealing with the potential water tariff for water supply if this component is finally included in the project. Until now nothing from the TFS deals with this issue.

The extension of water supply in the project area, classified as low income areas (LIAs) requires a close and intensive cooperation with Southern Region Water Board (SRWB) and the NGO. Usually the basic philosophy of the concept proposed by Water Board is that SRWB is responsible for construction of the facilities, such as water supply lines/ water kiosks/ rural piped water supply schemes. The operation and maintenance of the infrastructures shall be entrusted to private operators or to Water User Associations (WUA). The NGO should support the Water Board in identifying the location for water infrastructures and establish management associations / WUA.

The usual way to proceed is as follow:

- Development in close cooperation with the Water Board and the NGO of a jointly agreed work plan for extension of supply to LIAs, including a priority list of intervention areas, the route of the supply lines and distribution network, the position of water kiosks to be constructed, quality standards, and other issues deemed appropriate by the parties. The work plan should be timed and budgeted.
- Ensure consistency with the Water Board's rehabilitation, extension and expansion programme.
- Assist the Water Board in the procurement of the material necessary for the supply to low income areas.
- Provide assistance to the Water Board in the final design of a contract agreement with private kiosk operators and in the management and supervision of the contract and the kiosk operators.

In the case of SVIP, If the TFS propose to also develop the scheme for water supply, the Irrigation scheme will have to liase with the water board in order to develop the water supply infrastructures according to the local quality standard. Then various options are possible and presented in the following table:

*Table 5-27 : Drinking water supply option*

| Option | Option 1 : classic | Option 2 : concession | Option 3 : contract management | Option 3 : contract |
|---|---|---|---|---|
| Infrastructure Design | Water board/NGO | SVIP private operator and water board | Water board/NGO | SVIP private operator and water board |
| Finance the infrastructure | Water board | SVIP private operator | Water board | Water board |
| Maître d'oeuvre | Water board | | Water board | Water board |
| Realize the works | Private sector | SVIP private operator | Private sector | SVIP private operator and water board |
| Support for contracting | NGO | | PPP commission | SVIP private operator and water board |
| Operate and maintain the kiosk | Private sector/WUS/ Scheme Management Committees/BOT board of trustees | SVIP private operator | SVIP private operator | Private sector/WUS/ Scheme Management Committees/BOT board of trustees |
| Supervise the contract | Water board/NGO | Ministry of agriculture/irrigation and water development/PPP commission | Water board/NGO | SVIP private operator and water board |

*Source: financial model BRLi*

The level of tariff will be based on the current tariff for the Water Board as presented in the annex 3.

The tariff is binomial, with a fix part (minimum charges according to category whatever the consumption) and a variable part (according to consumption and category).

The minimum charges (fix part) is between 90 MK (communal points) to 249MK or 351MK (for individual users, according to density)

The water price per m3 (variable part of the tariff) is between 90 MK/m3 for water supplied from communal water points or kiosks up to 643,63 MK/m3 and 1,248.89 MK/m3 for water supplied for domestic purposes, according to the consumer category, and the quantity of water paid.

In the financial model no incomes has been estimated linked to drinking water supply because of a lake of information in the TFS regarding this issue.

## 5.2.3 Annual revision of the ISC

In order to simplify the administrative management, the contract between the parties (WPA) should allow an annual update for the variable part of the tariff in order to avoid the preparation of a new contract every year.

The water supplier has to cover variable charges such as energy cost, labour cost, equipment, etc. It is therefore necessary to provide an annual update of the water pricing to maintain or try to have a balanced budget (which is the long term objective). Thus, several options are available:

1. Price adjustment Coefficient (K) of the variable part of the tariff
2. Variable part of the water price update set by the water supplier every year
3. Variable part of the water price update set by a fixed percentage

### *5.2.3.1 Option 1: Price adjustment Coefficient (K)*

The introduction of a price adjustment coefficient (K) seems to be the most interesting system. It can take into account the variation of the parameters described above (energy cost, labour, etc).

It is also possible to take in consideration some parameters related to the customer income (eg selling price of the main crop cultivated). This allows to link water pricing to the crop profitability, then the capacity to pay of the customer.

Every parameter retained can be linked to a coefficient to give more or less weight to this one. For example, we can propose a basic system with coefficient K1 that allows annual adjustment only on the variable part of the tariff (the fix part being linked to financial cost of the loan doesn't required to be annually reviewed).

K1 linked to the variation part of the tariff which will depend on the actual volume of water delivered to the client. This variable water bill will also reflect the inflation; the labour cost variation; the fuel cost variation, etc.

Example:

K1= 15% x (Inflation)

+ 30% x (Labour cost variation)

+ 20% x (Fuel cost variation)

+ 35% x (Average Crop production price variation)

In this example, the variation of the crop production price will play the essential role on the variation part.

The rates (15% / 30 % / 20% /35%) proposed in the above example are usually defined based on the proportion of each component in the water cost. In the above example, the 30 % linked to labour cost means that the water cost is composed for 30% of the labour cost, etc.

The rate linked to the average crop production price variation gives a certain importance to the ability of the farmers to pay, but doesn't represent a true component of the water cost.

The price adjustment Coefficient could be linked directly with the monitoring system of irrigated agriculture performances.

The Price adjustment coefficient may also take in consideration the living cost. However, this coefficient takes in consideration parameters which do not have relation with irrigation and agriculture.

### 5.2.3.2 Option 2: Water price update set by the water supplier every year

In this case, the amount of the different charges that makes up the pricing is determined every year after an account analysis of the previous year:

- This solution can allow a gradual rise of the price if the water supplier wishes it.
- This solution can be satisfactory for the water supplier. However, this solution may not be accepted by the farmers and associations if they do not have the information. It requires better communication with the customers and associations to get approve the pricing update.
- It presents a low level of transparency and risks of abuses from the water supplier.

### 5.2.3.3 Option 3: Water price update set by a fixed percentage

The only advantage of this solution is its simplicity. It is not necessarily related to the production cost and may lead to significant lags year after year.

This solution may not be accepted by the farmers and associations if they do not understand the augmentation in correlation of their income.

### 5.2.3.4 Summary

The three options are summarized in the following table:

*Table 5-28: Advantages and disadvantages of the tree options for the annual revision of the ISC*

| Option | Advantages | Disadvantages |
|---|---|---|
| **Option 1: Price adjustment Coefficient (K)** | Take in consideration the customer income and regional inflation.<br>Fair and understandable ISC revision<br>Take in consideration the capacity to pay of the customer; customer will be able to continue using the services. | Requires yearly study to update the ISC (this could be link with the monitoring system of irrigated agriculture performances) |
| **Option 2: Water price update set by the water supplier every year** | Water supplier can set up the augmentation in correlation of his O&M cost | Difficult option to be approved by the customer<br>Requires yearly study to update the ISC (this could be link with the yearly financial statement of the scheme)<br>May lead to significant lags year after year and customers could be unable to pay |
| **Option 3: Water price update set by a fixed percentage** | Easy solution to implement | Difficult option to be approved by the customer<br>May lead to significant lags year after year and customers could be unable to pay |

**RECOMMENDATION**

We highly recommend Option 1 as it is a fair and understandable solution for the customer and the provider. It takes in consideration yearly economical component which allows the customers to continue using the services and the scheme operator to revise his price in relation with the inflation (eg: labour cost) to maintain an economical balance of the scheme.

## 5.3 VALUE FOR MONEY ANALYSIS

A value for money analysis has also been carried out to assess which of the various institutional options is the most relevant to carry out the SVIP.

The value for money analysis has been done by estimating the risk of investment delay (impact on CAPEX) and recovery rate (impact on incomes generation) as per the following five options:

1. No PPP implementation but project handled by the Public Authority;
2. A concession agreement is proposed;
3. A management contract is proposed;
4. A lease contract is proposed;
5. An affermage contract is proposed.

The following table shows the hypothesis used for the estimation of both risk in the case of each of the options. The principle is to estimate the investment expectancy (cost overrun) and the incomes expectancy of the various cases based on the probability defined. After various unsuccessful request to obtain from the public institutions national information about cost overrun and ISC collection rate related to national existing project, the consultant has been obliged to use probabilities estimated on his international experiences. These probabilities are presented below.

*Table 5-29: Hypothesis for value for money analysis*

| NPV | No PPP | Concession | Management | Lease | Affermage |
|---|---|---|---|---|---|
| **CAPEX (M.GHS)** | Probability of 50% to have 1 year of delay<br>Probability of 25% to have 2 year of delay<br>Probability of 25% to have 0 year of delay | Probability of 100% to have 0 year of delay | Probability of 80% to have 0 year of delay<br>Probability of 20% to have 1 year of delay | Probability of 80% to have 0 of delay<br>Probability of 20% to have 1 year of delay | Probability of 80% to have 0 year of delay<br>Probability of 20% to have 1 year of delay |
| **Revenu (M.GHS)** | Probability of 20% to have a recovery rate of 95%<br>Probability of 30 % to have a recovery rate of 70%<br>Probability of 50% to have a recovery rate of 60% | Probability of 90% to have a recovery rate of 95%<br>Probability of 10% to have a recovery rate of 70% | Probability of 30% to have a recovery rate of 95%<br>Probability of 50 % to have a recovery rate of 70%<br>Probability of 20% to have a recovery rate of 60 % | Probability of 90% to have a recovery rate of 95%<br>Probability of 10% to have a recovery rate of 70% | Probability of 80% to have a recovery rate of 95%<br>Probability of 20% to have a recovery rate of 70% |

*Source: financial model BRLi*

The investment cost expectancy for each kind of agreement (no PPP; concession contract; etc.) is the weighted average of the investments according to their probability (idem for the incomes expectancy).

The current investment cost for each case (investment done with no delay; with one year delay; etc.) is the sum of investments done over the investment period (cf. table 5-3), taking into account an inflation rate of 2%. If there is one year delay, the investment is made between 2018 and 2020 instead of between 2017 and 2019 so that it will increase the current investment cost.

The value for CAPEX according to the delay as well the value for incomes according to the recovery rate are provided by the model and are as described in the previous sections 5.1 "financial model". The following tables provide the details of the estimation of the investment and incomes expectancy for each PPP model.

*Table 5-30: Calculation of the expectancies*

| | CAPEX without delay | | CAPEX +1 year delay | | CAPEX +2 years delay | | |
|---|---|---|---|---|---|---|---|
| | NPV Investment cost (M. USD) | Probability | NPV Investment cost (M.USD) | Probability | NPV Investment cost (M.USD) | Probability | **Investment cost expectency** |
| **SVIP (no PPP)** | 242.44 | 25% | 247.29 | 50% | 252.23 | 25% | **247.31** |
| **SVIP Illovo canal (concession)** | 242.44 | 100% | 247.29 | 0% | 252.23 | 0% | **242.44** |
| **SVIP Illovo canal (Manag.contrat)** | 242.44 | 80% | 247.29 | 20% | 252.23 | 0% | **243.41** |
| **SVIP Illovo canal (Lease)** | 242.44 | 80% | 247.29 | 20% | 252.23 | 0% | **243.41** |
| **SVIP Illovo canal (affermage)** | 242.44 | 80% | 247.29 | 20% | 252.23 | 0% | **243.41** |
| **SVIP Illovo pipe (no PPP)** | 280.81 | 25% | 286.43 | 50% | 292.16 | 25% | **286.46** |
| **SVIP Illovo pipe (concession)** | 280.81 | 100% | 286.43 | 0% | 292.16 | 0% | **280.81** |

| | | recovery rate 60% | | recovery rate 70% | | recovery rate 95% | | |
|---|---|---|---|---|---|---|---|---|
| | | NPV incomes (M.USD) | Probability | NPV incomes (M.USD) | Probability | NPV incomes (M.USD) | Probability | **Incomes expectancy** |
| **Option 1 of WPA** | **SVIP Illovo canal (no PPP)** | 44.18 | 50% | 49.59 | 30% | 57.78 | 20% | **48.52** |
| | **SVIP Illovo canal (concession)** | 44.18 | 0% | 49.59 | 10% | 57.78 | 90% | **56.96** |
| | **SVIP Illovo canal (Manag.contrat)** | 44.18 | 20% | 49.59 | 50% | 57.78 | 30% | **50.97** |
| | **SVIP Illovo canal (Lease)** | 44.18 | 0% | 49.59 | 10% | 57.78 | 90% | **56.96** |
| | **SVIP Illovo canal (affermage)** | 44.18 | 0% | 49.59 | 20% | 57.78 | 80% | **56.14** |
| | **SVIP Illovo pipe (no PPP)** | 59.83 | 50% | 65.24 | 30% | 73.43 | 20% | **64.18** |
| | **SVIP Illovo pipe (concession)** | 59.83 | 0% | 65.24 | 10% | 73.43 | 90% | **72.62** |
| **Option 2 of WPA** | **SVIP Illovo canal (no PPP)** | 17.15 | 50% | 18.05 | 30% | 19.42 | 20% | **17.88** |
| | **SVIP Illovo canal (concession)** | 17.15 | 0% | 18.05 | 10% | 19.42 | 90% | **19.29** |
| | **SVIP Illovo canal (Manag.contrat)** | 17.15 | 20% | 18.05 | 50% | 19.42 | 30% | **18.28** |
| | **SVIP Illovo canal (Lease)** | 17.15 | 0% | 18.05 | 10% | 19.42 | 90% | **19.29** |
| | **SVIP Illovo canal (affermage)** | 17.15 | 0% | 18.05 | 20% | 19.42 | 80% | **19.15** |
| | **SVIP Illovo pipe (no PPP)** | 32.80 | 50% | 18.05 | 30% | 35.08 | 20% | **28.83** |
| | **SVIP Illovo pipe (concession)** | 32.80 | 0% | 18.05 | 10% | 35.08 | 90% | **33.38** |
| **Option 3 of WPA** | **SVIP (no PPP)** | 13.46 | 50% | 13.93 | 30% | 14.63 | 20% | **13.84** |
| | **SVIP Illovo canal (concession)** | 13.46 | 0% | 13.93 | 10% | 14.63 | 90% | **14.56** |
| | **SVIP Illovo canal (Manag.contrat)** | 13.46 | 20% | 13.93 | 50% | 14.63 | 30% | **14.05** |
| | **SVIP Illovo canal (Lease)** | 13.46 | 0% | 13.93 | 10% | 14.63 | 90% | **14.56** |
| | **SVIP Illovo canal (affermage)** | 13.46 | 0% | 13.93 | 20% | 14.63 | 80% | **14.49** |
| | **SVIP Illovo pipe (no PPP)** | 29.12 | 50% | 29.58 | 30% | 30.28 | 20% | **29.49** |
| | **SVIP Illovo pipe (concession)** | 29.12 | 0% | 29.58 | 10% | 30.28 | 90% | **30.21** |

*Source: financial model BRLi*

The results of the Value for money assessment are summarised below. They show that in general the PPP arrangements are more interesting than an ordinary management through Public Authority and that for all the technical and WPA options.

*Table 5-31: Results of Value for Money assessment*

| | | Investment cost expectancy (M.USD) | Incomes expectancy (M.USD) |
|---|---|---|---|
| Option 1 of WPA | SVIP (no PPP) | 247.3 | 48.5 |
| | SVIP Illovo canal (concession) | 242.4 | 57.0 |
| | SVIP Illovo canal (Manag.contrat) | 243.4 | 51.0 |
| | SVIP Illovo canal (Lease) | 243.4 | 57.0 |
| | SVIP Illovo canal (affermage) | 243.4 | 56.1 |
| | SVIP Illovo pipe (no PPP) | 286.5 | 64.2 |
| | SVIP Illovo pipe (concession) | 280.8 | 72.6 |
| Option 1 of WPA | SVIP (no PPP) | 247.3 | 17.9 |
| | SVIP Illovo canal (concession) | 242.4 | 19.3 |
| | SVIP Illovo canal (Manag.contrat) | 243.4 | 18.3 |
| | SVIP Illovo canal (Lease) | 243.4 | 19.3 |
| | SVIP Illovo canal (affermage) | 243.4 | 19.2 |
| | SVIP Illovo pipe (no PPP) | 286.5 | 28.8 |
| | SVIP Illovo pipe (concession) | 280.8 | 33.4 |
| Option 1 of WPA | SVIP (no PPP) | 247.3 | 13.8 |
| | SVIP Illovo canal (concession) | 242.4 | 14.6 |
| | SVIP Illovo canal (Manag.contrat) | 243.4 | 14.0 |
| | SVIP Illovo canal (Lease) | 243.4 | 14.6 |
| | SVIP Illovo canal (affermage) | 243.4 | 14.5 |
| | SVIP Illovo pipe (no PPP) | 286.5 | 29.5 |
| | SVIP Illovo pipe (concession) | 280.8 | 30.2 |

*Source: financial model BRLi*

Of the various PPP options the Value for money assessment shows that the concession is the most interesting model of PPP as long as it is also attractive for the private sector. The lease contract is the second most interesting PPP arrangement, not in terms of investment as it has the same investment expectancy than Management contract and affermage, but in terms of revenue. The incomes expectancy is better because in a lease, the rental payment to the authority tends to be fixed irrespective of the level of tariff collection that is achieved and so the operator takes a risk on bill collection and on receipts covering its operating costs. The Private operator will then be particularly vigilant to get the higher recovery rate. The options without PPP are always less attractive in terms of investment expectancy (higher investment cost) and incomes expectancy (lower incomes).

# 6. MAIN DOCUMENTS AND STAGES TO CARRY OUT

The various documents and stages required to carry out the PPP tender are described below.

## 6.1 THE NEGOTIATION PROCEDURE FOR WPA

The negotiation begins by mandating the negotiator on behalf of the government. Prior to entering any discussion with ILLOVO and the other trusts (Phata ; Kasinthula and Sandee ranch), the negotiator should have a clear mandate on the content of the WPA and on the objectives of the government in regard of pricing, quantity of water to be allocated and a general setup for the construction of the dedicated infrastructure. The negotiator would need to refer to a decision-making authority during the negotiation to settle the terms in case the mandate has to change.

This report and the calculation produced with the financial model will allow the government to set the mandate in terms of prices and water quantities to be delivered to ILLOVO and the other trusts.

The important decision in this regard relates to the allocation of the feeder canal costs to ILLOVO[1]. In the outset, it has been agreed that all dedicated infrastructure will be paid in full by ILLOVO but the allocation of the feeder canal costs between the different users has yet to be set. In the model, the allocation is based in proportion of the total area to be irrigated by the project in phase 1 and phase 2. ILLOVO will have to pay a share calculated by dividing his estates acreage by the total surface to be irrigated by the project multiplied by the cost of the feeder canal. As the feeder canal is designed in order to cope with the water flow needed to irrigate all the areas in phase 1 and 2, it is not possible to allocate its total cost to the area to be irrigated in phase 1.

Once agreed on the rule to allocate the costs of the feeder canal to ILLOVO and the other trusts, the mandate is sufficiently defined to begin formal negotiation with them. It is proposed to begin by sending in writing a proposal to join through a WPA the project, with indications on the pricing structure, the quantity of water allocated, and the rules to allocate costs for the feeder canal and the dedicated infrastructure. The currency for the payment of the irrigation service charges should be set to be US dollars. The technical options considered for the dedicated infrastructure should be presented in detail specifically for ILLOVO who has the choice between two technical options (Canal or pipe) to be decided upon by the party concerned.

Once the government receives a formal agreement to begin negotiation, meaning that ILLOVO and the other trusts agree to a WPA, it will be the proper time to begin negotiating the terms of the agreement. A delegation comprised of representatives from the government and their advisers, eventually including representatives of the donors should receive each water users' management representatives to discuss, negotiate and finalize the terms of the WPA.

This negotiation procedure doesn't take into account the savings realized by ILLOVO and other trusts, switching from a pump based system to gravity irrigation. The available information is not accurate enough to set the pricing system in the WPA in order to share these savings. What is considered as a priority for the government is to secure the payment in US dollars in order to finance the project on hard currencies and low interest rates. Obviously, if the government considers that the potential energy savings from ILLOVO should be part of the negotiation, the team of negotiators representing the government will adjust the pricing options to take that in account.

[1] For the other trusts, the level of subsidy is high and would allow to impose the terms of the WPA. They will have the option of refusing the connection and keeping their pumping stations.

## 6.2 ORGANISATION OF THE INVESTOR CONFERENCES

Once the project is finalized, it would be possible to organize as initially planned an investor's conference to market it. The investors list will be prepared by consultants drawing on their expertise. It will be completed by the government and donors.

It will be set in Blantyre and Johannesburg in partnership with the consultants' subcontractor.

## 6.3 MARKETING AND PRE SELECTION DOCUMENTS REQUIRED

It is proposed to conduct an open tender with pre-selection. This process will allow the Ministry to test the market before launching the real tender process.

The first step of the pre selection is the creation of a committee of coordination and monitoring of the process or to empower the existing committee. The Committee's role is to coordinate the various concerned authorities and monitor the process. Each Committee member shall have all the powers of his administration allowing it to take the necessary decisions at each stage of the process and ensure that procedures are transparent and equals, in particular through information provided to potential partners and contacts with them.

The Committee should be composed of the following members:

- Representative of the Ministry of Agriculture, irrigation and water development;
- Representative of the Ministry of finance;
- The PPP commission;
- Donors' representatives as observers.

The Committee may add any other entity which could be necessary to the process.

The second step is the publication of a call for expression of interests in the national economic newspapers, international and specialized magazines. It should also be posted on various websites such as, World Bank Website, the European Union Website, Embassies websites, Development business and/or DGMarket website... We strongly recommend preparing a list of potentially interested private partners to contact before the starting of the advertisement campaign to inform them in advance of the publication.

The publication would formalize the launch of the PPP process and should mention the date of availability of the pre-qualification file, as well as a date and location of the information meeting for potentially interested partners. The prequalification file would only be available on demand.

It would consist of:

- A brief description of the agriculture in Malawi and legal framework for private public partnerships in irrigation,
- An overview of the project and objectives of the State,
- The provisional timetable,
- An information on the method (criteria) of pre selection and partner's profile,
- The practicalities enabling potential partners to submit an application for pre-qualification,
- The deadline for submission of pre-qualification proposals,
- A confidentiality agreement.
- A meeting with representatives of the ministries and local concerned administrative entities must be planned to explain accurately the conditions of pre-qualification to the private partners and encourage them to participate in the process of pre-qualification.

The criteria for screening candidates will be specified by the Committee. They may include the following elements:

- Economic and financial capacity,
- Professional and technical knowledge or ability and references.
- The rules relating to the composition of the groups could be as follows:
- Prohibition to change the composition of the group between the dates of submission of the bid and the signing of the agreement,
- Every changes is subject to the agreement of the Committee,
- ...

The results of the pre-qualification must be announced and communicated to each company having submitted a file.

## 6.4 TENDER DOCUMENTS TO BE PRODUCED

We insist on the importance of the phase of preparation of the tender folder. In the framework of this assignment the consultant provides the draft concession contract which is the most important document of the tender dossier. A PIN will also be provided once the options defined. This will be used as the information memorandum. Other documents have to be provided but they are usually classic documents that don't required much adaptation. The Ministry of agriculture, irrigation and water development support by the PPP commission and a transaction adviser will then be able to prepare the other constitutive elements of the tender dossier.

The tender dossier would consist of:

- The draft PPP contract,(provided by the present consultancy)
- The information memorandum,(PIN, provide by the present consultancy)
- The letter of invitation to the tender,
- The rules of the tender,
- The partnership agreement,
- A detailed planning of the selection process,
- Any document specific to the project that would be essential to the Candidates for the tender preparation.

We recommend organizing a visit of the area concerned by the project two weeks after the sending of the tender dossier. It will allow the candidates to ask questions and have an overview of the project at the beginning of the tender process. It is much better for the quality of the prepared tender documents.

An option is to develop a virtual data room on a website offering a secure access that allows managing different levels of access for different stakeholders. Data collected during the study, pictures and maps and selected documents produced by the experts could be made available on the website.

At the end of the period of "due diligence" of candidates, they will submit their comments on the Tender Dossier, draft partnership agreement and specifications. After receipt and analysis of these comments, the Committee will accept or reject the comments of candidates and will answer to the questions.

Each answer of the Committee must be sent to all the Candidates.

The consultant advice the Public Authority to hire a transaction adviser as soon as the decision is taken to start the bidding process in order to set up the PPP arrangement.

## 6.5 EVALUATION OF THE TENDER AND NEGOTIATION

The tender procedure will depend on the choice of the Committee between a classic approach and a competitive dialogue. A PPP transaction adviser should be recruited to support the public authority in this stage.

For the first option, the negotiation will focus on technical and financial aspects after the proclamation of the results. In the second option, a competitive dialogue can be conducted with two or three candidates before the proclamation of the results. This procedure has therefore a greater margin for negotiation. However, it requires the application of more stringent transparency rules because of the high risk of information leaks. The Committee must respect the intellectual property, the specificity of the solutions of the various candidates and prohibit organizing the transfer of information between the candidates.
Because of its higher cost and the need to maintain competitive pressure on the candidates and the interest of the authorities concerned, the dialogue must be continuous and limited in time. It shall not exceed six months, including the completion and signing of the agreement. That's why we recommend using the classic approach.

The criteria for evaluation of tender documents will be specified by the Committee. They may include the following elements:

Mandatory Qualification Criteria (for example: the bidder must confirm that non-performance of a contract did not occur within the last 3 years prior to the deadline for bid submission, based on all fully settled disputes or litigation ; the bidder must submit audited balance sheets or if not required by the law of the country, other financial statements acceptable to the Employer, for the last 3 years to demonstrate the current soundness of the bidder's financial position and its prospective long term profitability; Participation as contractor, management contractor or subcontractor, in at least two contracts for each of the following three key activities: i) design and supervision of construction works for large scale surface irrigation ; (ii) operation and maintenance of irrigation or other water utility schemes or that the bidder has experience in providing specialist advice on operational and maintenance activities; (iii) training in agricultural and irrigation issues or that the bidder has experience in activities related to support water user associations.)

Technical criteria: general qualifications and experience of the firm, approach, methodology and work plan, key professional staff

## 6.6 ASSOCIATED CONTRACTUAL ARRANGEMENT

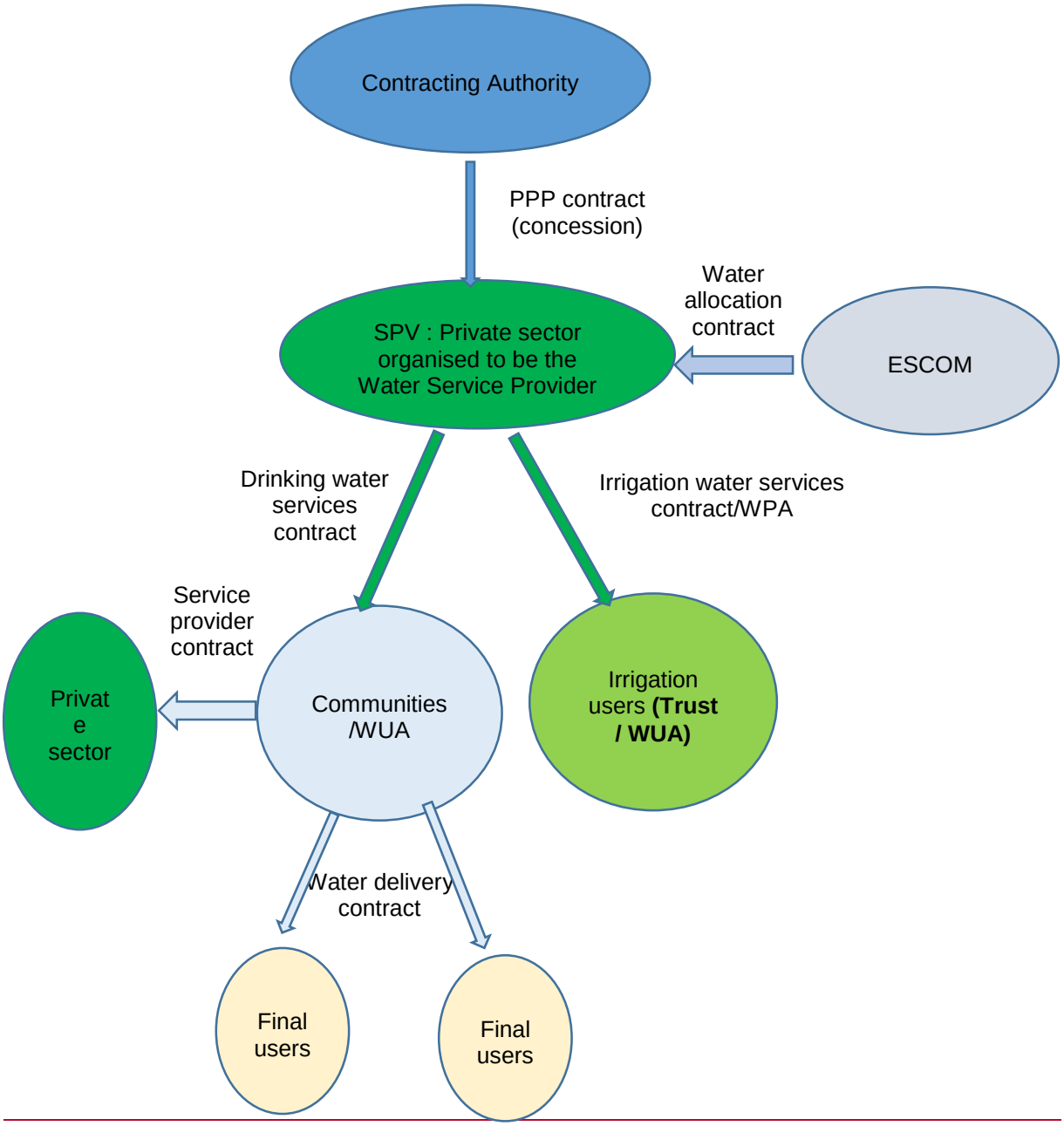
Other contractual documents could be interesting to provide in view of efficient management of the scheme. Those agreements could be for example:

- Standard water concession contract (water right according to water resources act)
- Standard irrigation water service contract, between scheme operator organised in SPV and users
- Water purchase agreement between the scheme operator and Illovo
- Standard drinking water service contract, between scheme operator and users
- Standard water delivery contract between the WUAs its member if any WUAs are proposed for irrigation or water supply
- Standard contract document with private providers of maintenance services that can be adapt by the WUAs to various specific cases of procurement of supply of goods (purchase of materials) or services (construction, maintenance)
- Standard employment contract that can be adapted by the WUA in accordance with their needs

Except the WPA, the contract about water service (irrigation and drinking) can be asked to be produced by the private sector that will be in charge of the scheme. The contract linked to WUA will be required only if this kind of arrangement is set up inside the command area of the scheme.

The following figures summarized the contractual relationships required to implement the project.

*Figure 6-1: Contractual relationships between the parties*




The part linked to drinking water supply is at the current stage of the TFS note proposed. It will have to be further discuss with the stakeholders to see if this component has to be part of the SIVP.

# ANNEXES

# Annex 1.

# Risk allocation according to the type of PPP contract

| | | | Risks assumed by Private Partner according to the options | | |
|---|---|---|---|---|---|
| | | | SVIP | | |
| **Risk** | **Description** | **Allocation** | **Management contract** | **Lease contract/affermage** | **Concession** |
| **Commercial** | The risk that operating revenues differ from expected revenues. Commercial risk is often broken down into:<br><br>•Demand risk, when customers use the service less than expected<br><br>•Payment risk (fees collection), when customers do not pay the expected fees, or pay their bills later than expected<br><br>Land risk: when land conflicts delay the implementation of the project and become an barrier to the development of commercial farms | If the PPP involves a private operator taking over the operations of a service for which there is well-established demand and payment capacity, this may be borne completely by the private operator<br><br>If the PPP is for a food security oriented project with uncertain demand, serving customers whose payment capacity has not been tested, or if demand and payment risks are quite high, these risks may be shared between the public party and private operator or borne completely by the public party | No | Yes (high) | Yes |
| **Operational** | The risk that the infrastructure provided or service delivered:<br>•Has higher O&M costs than expected<br><br>•Is interrupted or ceased because of a fault of the operator<br><br>•Failed to meet original specification | Usually assumed by the private operator because it has responsibility for operating the facility to provide the service.<br><br>However where inputs (electricity) are controlled by the Government, the Government may take on risks related to the provision of this input. In this case, the water and the energy availabilities must be secured and guarantees by the public party. | Shared | Shared | Shared |
| **Water availability risk** | The risk that the available water is insufficient for irrigation | Usually assumed by the private operator because it has responsibility for operating the facility to provide the service.<br><br>However where water resource is controlled by the Government or other institution, the Government or this concerned institution may take on risks related to the provision of this input. In this case, the water must be secured and guarantees by | Shared | Shared | Shared |

| | | | Risks assumed by Private Partner according to the options | | |
|---|---|---|---|---|---|
| | | | SVIP | | |
| **Risk** | **Description** | **Allocation** | **Management contract** | **Lease contract/affermage** | **Concession** |
| | | the public party or by a contractual arrangement with the other institution. | | | |
| **design,** | Design project and cost estimation have mistakes | To be assumed by the party in charge of design. | Yes | No | Yes |
| **Works risk / Construction** | The risk that quantities or prices of inputs are higher than planned or that construction takes longer, than estimated. | To be assumed by the party in charge of construction. | No | No | Yes |
| **Financial** | The risk of the project failing to obtain financing, or that financing terms will differ from forecasts<br><br>The risk that variability in foreign exchange rates will affect project profitability. This risk is high when project inflows are in a different currency than project outflows, such as debt repayments or input purchases.<br><br>The risk related to the variation of the rate of interest | If the project involved the private sector in the funding functions but requires Government funds to be financially viable, the Government may need to bear some degree of financial risk.<br><br>May be shared between private operator and the public party, or consumers, through indexation of prices<br><br>Where Government policy has a large impact on exchange rates, the private party may have to bear a larger share of exchange rate risk. | Yes | Yes | Shared |
| **Environnemental and social** | Risk that the project impact negatively the local environment and the social organisation or that the project go against the communities expectations | To be assumed by the party in charge of the design and by the party in charge of land development | Shared | No | Shared |
| **Political** | The risk that legal or political changes negatively impact the project. Examples include the risks of political decision on water fees/electricity tariff/VAT, inability to repatriate dividends, or inconvertibility of foreign exchange | Usually borne by the private operator. Some Government or multilateral agencies offer insurance against these types of risks, such as Political Risk Insurance offered by the U.S. | Yes | Yes | Yes |
| **Force Majeure and natural risks** | The risk of events beyond the control of either party.<br><br>Force majeure risks can be categorized as “insurable” and “uninsurable”. Acts of nature, such as earthquakes, floods or droughts are typically insurable. Some political events, such as acts of | If the risks are insurable, they are usually assumed by the private operator, who may obtain an insurance policy to mitigate its exposure to these risks<br><br>If the risks are uninsurable, they are usually assumed by the public party | Shared | Shared | Shared |

| | | | Risks assumed by Private Partner according to the options | | |
|---|---|---|---|---|---|
| | | | SVIP | | |
| Risk | Description | Allocation | Management contract | Lease contract/affermage | Concession |
| | terrorism or wars, are typically uninsurable | | | | |

# Annex 2.

# WPA excel model for Irrigation Service Charge assessment

An excel model has been developed to estimate the water price that could be proposed according to the various options.in the framework of the WPA for Illovo, for the existing trusts (Phata, Kasinthula and sandee ranch) and for the future water users of new development areas and

The model, made of various excel sheet and linked to the PPP financial model based the calculation on the price data provided by the TFS team of the SVIP.

The assumptions used in the model are the followings.

## General assumptions:

- The assessment is made in courant price
- Duration of the WPA: 25 years
- International inflation rate: 2%
- National inflation rate: 7%
- Net Present Value rate: 10%
- Net present value for debt service: 2%
- Estimation of National Water Resource Authority water abstraction fees: 2.50 MKW / 250m3 (source: Establishment of the national water resource authority(

## CAPEX estimation for each areas

- Contingency represents 26% of the direct investment cost (20% of direct cost for contingency and 6% of direct cost for consultant).
- The investment cost for the intake and feeder canal is planned over a 3 years period
- The investment cost for the branch is planned over a 1 year period
- The direct costs used are those defined by the TFS teams.

*Table 6-1: sharing of investment cost between the water users option 1 of WPA*

| | Global investment costof the project. M.USD | | Sharing of Investment cost considered in WPA - M. USD | | | | | | Investment cost not considered in WPA option | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total Option canal Illovo | Total Option pipe Illovo | CAPEX concerning Illovo (option canal) | CAPEX concerning Illovo (option pipe) | CAPEX concerning Kasintula/phata/ sandee | CAPEX concerning new land area I1 | CAPEX concerning new land zone A | CAPEX concerning Phase 2 | Delta compare to option canal illovo | Delta compare to option canal pipe |
| Inlet | 4.00 | 4.00 | 0.94 | 0.94 | 0.21 | 0.47 | 0.40 | 1.98 | 0.00 | 0.00 |
| Feeder | 33.10 | 33.10 | 7.78 | 7.78 | 1.70 | 3.91 | 3.28 | 16.43 | 0.00 | 0.00 |
| **PHASE I** | | | | | | | | | 0.00 | 0.00 |
| **ZONE I-1 (canal option for Kasinthula / Phata)** | | | | | | | | | 0.00 | 0.00 |
| Branch I1 | 0.30 | 0.30 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 1 | 1.25 | 1.25 | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 2 | 0.49 | 0.49 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I3 | 0.90 | 0.90 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I4 | 0.52 | 0.52 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I5 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 9.78 | 9.78 | 0.00 | 0.00 | 0.00 | 9.78 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infield surface | 44.31 | 44.31 | 0.00 | 0.00 | 0.00 | 44.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infield drainage and road | 11.08 | 11.08 | 0.00 | 0.00 | 0.00 | 11.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE I-2 (canal option)** | | | | | | | | | 0.00 | 0.00 |
| Illovo canal | 5.90 | 34.60 | 5.90 | 34.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE A** | | | | | | | | | 0.00 | 0.00 |
| Bangula canal A | 7.80 | 7.80 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 6.50 | 0.00 | 0.00 |
| Zone A canal (siphon) | 11.60 | 11.60 | 0.00 | 0.00 | 0.00 | 0.00 | 1.93 | 9.67 | 0.00 | 0.00 |
| Branch A1 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 |
| Branch A2 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| Branch A3 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 |
| Branch A4 | 0.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 |
| Branch A5 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 7.27 | 7.27 | 0.00 | 0.00 | 0.00 | 0.00 | 7.27 | 0.00 | 0.00 | 0.00 |
| Infield surface | 32.94 | 32.94 | 0.00 | 0.00 | 0.00 | 0.00 | 32.94 | 0.00 | 0.00 | 0.00 |
| Infield drainage and road | 8.24 | 8.24 | 0.00 | 0.00 | 0.00 | 0.00 | 8.24 | 0.00 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 1 | 181.82 | 210.52 | 14.63 | 43.33 | 4.53 | 70.62 | 57.46 | 34.58 | 0.00 | 0.00 |
| Contengency (20% of direct cost | 36.36 | 42.10 | 2.93 | 8.67 | 0.91 | 14.12 | 11.49 | 6.92 | 0.00 | 0.00 |
| Consultant (6% of direct cost) | 10.91 | 12.63 | 0.88 | 2.60 | 0.27 | 4.24 | 3.45 | 2.07 | 0.00 | 0.00 |
| O&M asset (for phase 1 only) | | | | | | | | | 0.00 | 0.00 |
| O&M asset | 0.27 | 0.27 | 0.06 | 0.06 | 0.01 | 0.03 | 0.03 | 0.14 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 only | 229.37 | 265.53 | 18.49 | 54.65 | 5.72 | 89.02 | 72.43 | 43.70 | 0.00 | 0.00 |
| Phase II | | | | | | | | | 0.00 | 0.00 |
| Bangula phase II | 31.80 | 31.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.80 | 0.00 | 0.00 |
| Branch phase II | 7.00 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.00 | 0.00 | 0.00 |
| land consolidation B / C / D | 30.38 | 30.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.38 | 0.00 | 0.00 |
| Second&tertiary B /C/ D | 134.09 | 134.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 134.09 | 0.00 | 0.00 |
| Road and drainage B / C /D | 33.52 | 33.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.52 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 2 | 236.79 | 236.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 236.79 | 0.00 | 0.00 |
| Contengency (20% of direct cost | 47.36 | 47.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.36 | 0.00 | 0.00 |
| Consultant (6% of direct cost) | 14.21 | 14.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.21 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 2 only | 298.36 | 298.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 298.36 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 and 2 | 527.72 | 563.88 | 18.49 | 54.65 | 5.72 | 89.02 | 72.43 | 342.06 | 0.00 | 0.00 |

*Table 6-2: sharing of investment cost between the water users option 2 of WPA*

| | Global investment costof the project. M.USD | | Sharing of Investment cost considered in WPA - M. USD | | | | | | Investment cost not considered in WPA option | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total Option canal Illovo | Total Option pipe Illovo | CAPEX concerning Illovo (option canal) | CAPEX concerning Illovo (option pipe) | CAPEX concerning Kasintula/phata/ sandee | CAPEX concerning new land area I1 | CAPEX concerning new land zone A | CAPEX concerning Phase 2 | Delta compare to option canal illovo | Delta compare to option canal pipe |
| Inlet | 4.00 | 4.00 | 0.94 | 0.94 | 0.21 | 0.47 | 0.40 | 1.98 | 0.00 | 0.00 |
| Feeder | 33.10 | 33.10 | 7.78 | 7.78 | 1.70 | 3.91 | 3.28 | 16.43 | 0.00 | 0.00 |
| **PHASE I** | | | | | | | | | 0.00 | 0.00 |
| **ZONE I-1 (canal option for Kasinthula / Phata)** | | | | | | | | | 0.00 | 0.00 |
| Branch I1 | 0.30 | 0.30 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 1 | 1.25 | 1.25 | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 2 | 0.49 | 0.49 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I3 | 0.90 | 0.90 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I4 | 0.52 | 0.52 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I5 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 9.78 | 9.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.78 | 9.78 |
| Infield surface | 44.31 | 44.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.31 | 44.31 |
| Infield drainage and road | 11.08 | 11.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.08 | 11.08 |
| **ZONE I-2 (canal option)** | | | | | | | | | 0.00 | 0.00 |
| Illovo canal | 5.90 | 34.60 | 5.90 | 34.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE A** | | | | | | | | | 0.00 | 0.00 |
| Bangula canal A | 7.80 | 7.80 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 6.50 | 0.00 | 0.00 |
| Zone A canal (siphon) | 11.60 | 11.60 | 0.00 | 0.00 | 0.00 | 0.00 | 1.93 | 9.67 | 0.00 | 0.00 |
| Branch A1 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 |
| Branch A2 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| Branch A3 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 |
| Branch A4 | 0.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 |
| Branch A5 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 7.27 | 7.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.27 | 7.27 |
| Infield surface | 32.94 | 32.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.94 | 32.94 |
| Infield drainage and road | 8.24 | 8.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.24 | 8.24 |
| TOTAL INFRASTRUCTURE phase 1 | 181.82 | 210.52 | 14.63 | 43.33 | 4.53 | 5.45 | 9.01 | 34.58 | 113.62 | 113.62 |
| Contengency (20% of direct cost | 36.36 | 42.10 | 2.93 | 8.67 | 0.91 | 1.09 | 1.80 | 6.92 | 22.72 | 22.72 |
| Consultant (6% of direct cost) | 10.91 | 12.63 | 0.88 | 2.60 | 0.27 | 0.33 | 0.54 | 2.07 | 6.82 | 6.82 |
| O&M asset (for phase 1 only) | | | | | | | | | 0.00 | 0.00 |
| O&M asset | 0.27 | 0.27 | 0.06 | 0.06 | 0.01 | 0.03 | 0.03 | 0.14 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 only | 229.37 | 265.53 | 18.49 | 54.65 | 5.72 | 6.90 | 11.38 | 43.70 | 143.16 | 143.16 |
| Phase II | | | | | | | | | 0.00 | 0.00 |
| Bangula phase II | 31.80 | 31.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.80 | 0.00 | 0.00 |
| Branch phase II | 7.00 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.00 | 0.00 | 0.00 |
| land consolidation B / C / D | 30.38 | 30.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.38 | 0.00 | 0.00 |
| Second&tertiary B /C/ D | 134.09 | 134.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 134.09 | 0.00 | 0.00 |
| Road and drainage B / C /D | 33.52 | 33.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.52 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 2 | 236.79 | 236.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 236.79 | 0.00 | 0.00 |
| Contengency (20% of direct cost | 47.36 | 47.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.36 | 0.00 | 0.00 |
| Consultant (6% of direct cost) | 14.21 | 14.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.21 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 2 only | 298.36 | 298.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 298.36 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 and 2 | 527.72 | 563.88 | 18.49 | 54.65 | 5.72 | 6.90 | 11.38 | 342.06 | 143.16 | 143.16 |

*Table 6-3: sharing of investment cost between the water users option 3 of WPA*

| | Global investment costof the project. M.USD | | Sharing of Investment cost considered in WPA - M. USD | | | | | | Investment cost not considered in WPA option | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total Option canal Illovo | Total Option pipe Illovo | CAPEX concerning Illovo (option canal) | CAPEX concerning Illovo (option pipe) | CAPEX concerning Kasintula/phata/ sandee | CAPEX concerning new land area I1 | CAPEX concerning new land zone A | CAPEX concerning Phase 2 | Delta compare to option canal illovo | Delta compare to option canal pipe |
| Inlet | 4.00 | 4.00 | 0.94 | 0.94 | 0.00 | 0.00 | 0.00 | 1.98 | 1.07 | 1.07 |
| Feeder | 33.10 | 33.10 | 7.78 | 7.78 | 0.00 | 0.00 | 0.00 | 16.43 | 8.89 | 8.89 |
| **PHASE I** | | | | | | | | | 0.00 | 0.00 |
| **ZONE I-1 (canal option for Kasinthula / Phata)** | | | | | | | | | 0.00 | 0.00 |
| Branch I1 | 0.30 | 0.30 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 1 | 1.25 | 1.25 | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 2 | 0.49 | 0.49 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I3 | 0.90 | 0.90 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I4 | 0.52 | 0.52 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I5 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 9.78 | 9.78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.78 | 9.78 |
| Infield surface | 44.31 | 44.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 44.31 | 44.31 |
| Infield drainage and road | 11.08 | 11.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.08 | 11.08 |
| **ZONE I-2 (canal option)** | | | | | | | | | 0.00 | 0.00 |
| Illovo canal | 5.90 | 34.60 | 5.90 | 34.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE A** | | | | | | | | | 0.00 | 0.00 |
| Bangula canal A | 7.80 | 7.80 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 6.50 | 0.00 | 0.00 |
| Zone A canal (siphon) | 11.60 | 11.60 | 0.00 | 0.00 | 0.00 | 0.00 | 1.93 | 9.67 | 0.00 | 0.00 |
| Branch A1 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 |
| Branch A2 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| Branch A3 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 |
| Branch A4 | 0.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 |
| Branch A5 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 7.27 | 7.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.27 | 7.27 |
| Infield surface | 32.94 | 32.94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 32.94 | 32.94 |
| Infield drainage and road | 8.24 | 8.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.24 | 8.24 |
| TOTAL INFRASTRUCTURE phase 1 | 181.82 | 210.52 | 14.63 | 43.33 | 2.63 | 1.07 | 5.33 | 34.58 | 123.58 | 123.58 |
| Contengency (20% of direct cost | 36.36 | 42.10 | 2.93 | 8.67 | 0.53 | 0.21 | 1.07 | 6.92 | 24.72 | 24.72 |
| Consultant (6% of direct cost) | 10.91 | 12.63 | 0.88 | 2.60 | 0.16 | 0.06 | 0.32 | 2.07 | 7.42 | 7.42 |
| O&M asset (for phase 1 only) | | | | | | | | | 0.00 | 0.00 |
| O&M asset | 0.27 | 0.27 | 0.06 | 0.06 | 0.01 | 0.03 | 0.03 | 0.14 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 only | 229.37 | 265.53 | 18.49 | 54.65 | 3.33 | 1.38 | 6.74 | 43.70 | 155.72 | 155.72 |
| Phase II | | | | | | | | | 0.00 | 0.00 |
| Bangula phase II | 31.80 | 31.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.80 | 0.00 | 0.00 |
| Branch phase II | 7.00 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.00 | 0.00 | 0.00 |
| land consolidation B / C / D | 30.38 | 30.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.38 | 0.00 | 0.00 |
| Second&tertiary B /C/ D | 134.09 | 134.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 134.09 | 0.00 | 0.00 |
| Road and drainage B / C /D | 33.52 | 33.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.52 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 2 | 236.79 | 236.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 236.79 | 0.00 | 0.00 |
| Contengency (20% of direct cost | 47.36 | 47.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.36 | 0.00 | 0.00 |
| Consultant (6% of direct cost) | 14.21 | 14.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.21 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 2 only | 298.36 | 298.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 298.36 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 and 2 | 527.72 | 563.88 | 18.49 | 54.65 | 3.33 | 1.38 | 6.74 | 342.06 | 155.72 | 155.72 |

*Table 6-4 ; sharing of investment cost between the water users option 4 of WPA (additional option)*

| | Global investment costof the project. M.USD | | Sharing of Investment cost considered in WPA - M. USD | | | | | | Investment cost not considered in WPA option | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total Option canal Illovo | Total Option pipe Illovo | CAPEX concerning Illovo (option canal) | CAPEX concerning Illovo (option pipe) | CAPEX concerning Kasintula/phata/ sandee | CAPEX concerning new land area I1 | CAPEX concerning new land zone A | CAPEX concerning Phase 2 | Delta compare to option canal illovo | Delta compare to option canal pipe |
| Inlet | 4.00 | 4.00 | 0.94 | 0.94 | 0.00 | 0.00 | 0.00 | 1.98 | 1.07 | 1.07 |
| Feeder | 33.10 | 33.10 | 7.78 | 7.78 | 0.00 | 0.00 | 0.00 | 16.43 | 8.89 | 8.89 |
| **PHASE I** | | | | | | | | | 0.00 | 0.00 |
| **ZONE I-1 (canal option for Kasinthula / Phata)** | | | | | | | | | 0.00 | 0.00 |
| Branch I1 | 0.30 | 0.30 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 1 | 1.25 | 1.25 | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I2 - partie 2 | 0.49 | 0.49 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I3 | 0.90 | 0.90 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I4 | 0.52 | 0.52 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.00 |
| Branch I5 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 9.78 | 9.78 | 0.00 | 0.00 | 0.00 | 9.78 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infield surface | 44.31 | 44.31 | 0.00 | 0.00 | 0.00 | 44.31 | 0.00 | 0.00 | 0.00 | 0.00 |
| Infield drainage and road | 11.08 | 11.08 | 0.00 | 0.00 | 0.00 | 11.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE I-2 (canal option)** | | | | | | | | | 0.00 | 0.00 |
| Illovo canal | 5.90 | 34.60 | 5.90 | 34.60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **ZONE A** | | | | | | | | | 0.00 | 0.00 |
| Bangula canal A | 7.80 | 7.80 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 6.50 | 0.00 | 0.00 |
| Zone A canal (siphon) | 11.60 | 11.60 | 0.00 | 0.00 | 0.00 | 0.00 | 1.93 | 9.67 | 0.00 | 0.00 |
| Branch A1 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 |
| Branch A2 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| Branch A3 | 0.32 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 |
| Branch A4 | 0.36 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 |
| Branch A5 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Secondary + Tertiary canals | 7.27 | 7.27 | 0.00 | 0.00 | 0.00 | 0.00 | 7.27 | 0.00 | 0.00 | 0.00 |
| Infield surface | 32.94 | 32.94 | 0.00 | 0.00 | 0.00 | 0.00 | 32.94 | 0.00 | 0.00 | 0.00 |
| Infield drainage and road | 8.24 | 8.24 | 0.00 | 0.00 | 0.00 | 0.00 | 8.24 | 0.00 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 1 | 181.82 | 210.52 | 14.63 | 43.33 | 2.63 | 66.24 | 53.78 | 34.58 | 9.96 | 9.96 |
| Contengency (20% of direct cost | 36.36 | 42.10 | 2.93 | 8.67 | 0.53 | 13.25 | 10.76 | 6.92 | 1.99 | 1.99 |
| Consultant (6% of direct cost) | 10.91 | 12.63 | 0.88 | 2.60 | 0.16 | 3.97 | 3.23 | 2.07 | 0.60 | 0.60 |
| O&M asset (for phase 1 only) | | | | | | | | | 0.00 | 0.00 |
| O&M asset | 0.27 | 0.27 | 0.06 | 0.06 | 0.01 | 0.03 | 0.03 | 0.14 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 only | 229.37 | 265.53 | 18.49 | 54.65 | 3.33 | 83.50 | 67.79 | 43.70 | 12.56 | 12.56 |
| Phase II | | | | | | | | | 0.00 | 0.00 |
| Bangula phase II | 31.80 | 31.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 31.80 | 0.00 | 0.00 |
| Branch phase II | 7.00 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.00 | 0.00 | 0.00 |
| land consolidation B / C / D | 30.38 | 30.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 30.38 | 0.00 | 0.00 |
| Second&tertiary B /C/ D | 134.09 | 134.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 134.09 | 0.00 | 0.00 |
| Road and drainage B / C /D | 33.52 | 33.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 33.52 | 0.00 | 0.00 |
| TOTAL INFRASTRUCTURE phase 2 | 236.79 | 236.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 236.79 | 0.00 | 0.00 |
| Contengency (20% of direct cost | 47.36 | 47.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 47.36 | 0.00 | 0.00 |
| Consultant (6% of direct cost) | 14.21 | 14.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.21 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 2 only | 298.36 | 298.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 298.36 | 0.00 | 0.00 |
| TOTAL PROJECT Phase 1 and 2 | 527.72 | 563.88 | 18.49 | 54.65 | 3.33 | 83.50 | 67.79 | 342.06 | 12.56 | 12.56 |

## loan assumptions

- It is supposed that 100% of the direct investment costs are payed through an international loan in USD
- Duration of the loan: 15 years
- Interest rate: 2%
- Grace period considered: 3 years

## O&M cost assumption and renewal fund

The O&M cost per year is considered as per the proposition of the TFS:

- O&M of the intake: 2% of the direct intake cost
- O&M of feeder canal: 1% of the direct feeder cost
- O&M of the branch/ secondary and tertiary: 1%
- It is at this stage proposed that an annual additional charge of 0.5% of the CAPEX is added as a provision for the renewal fund and big repair.

For each option assessed the figures of O&M and provision for renewal fund are presented in the section 5.2.1 of the report table 5-21 to table 5-23

## Annual water demand assumption:

The assumption for the various areas (Illovo, existing trust; new development area I1 and new development area A) annual water demand is estimated as already presented in the core of the present report *Table 2-3: Estimated water requirement for phase 1*.

| Zone of phase 1 | land development | Cropping pattern | Surface (ha) | Irrigation efficiency TFS (conveyance x distribution x field application) | m3 per year TFS 5 year requirement | m3 per year TFS av. (2.33 year requirement) |
|---|---|---|---|---|---|---|
| Zone I-1 | Kasinthula | Sugar cane | 1426 | 52.1% | 37 507 245 | 30 561 933 |
| Zone I-1 | Phata | Sugar cane | 296 | 52.1% | 7 769 168 | 6 330 529 |
| Zone I-1 | Sande Ranch | Sugar cane | 454 | 52.1% | 11 916 226 | 9 709 664 |
| Zone I-1 | New land | cotton - soya beans - trop fruits / dry beans - maize - trop fruit | 5020 | 52.1% | 138 198 215 | 114 386 084 |
| Zone I-2 | Illovo - Nchalo | Sugar cane | 9995 | 52.1% | 262 340 763 | 213 762 474 |
| Zone A | New land | cotton - soya beans - trop fruits / dry beans - maize - trop fruit | 4214 | 52.1% | 116 009 417 | 96 020 509 |
| **Total** | | | **21 405** | | **573 741 034** | **470 771 193** |

## Results tables for the various options and for the various areas concerned by the WPA

As already explained in the core of the report, the value of the ISC variable part and the value of the ISC fixed part have been obtained as follow:

- **Variable part (linked to water consumption)**: the total Net Present Value of the charges (NPV rate 10%) : OPEX/renewal fund/Water right for basin authority, have been divided by the Present estimation of the water demand (NPV rate: 10%).

- **Fixe part (linked to irrigated area)**: The total Net Present Value of the financial cost (NPV rate 2%) has been divided by the irrigated area of each water users (Illovo/existing trusts; new development area I1, new development area A).

## The detail of the calculation can be consulted directly on the excel files, provided separately

# Annex 3.

# SRWB tariff for water supply

# SOUTHERN REGION WATER BOARD (SRWB)
# WATER TARIFFS

| Service Charges | Minimum Charges |
|---|---|
| Low Density | MK351.00 |
| Medium Density | MK249.00 |
| Institution | MK1,416.00 |
| Commercial | MK1,936.00 |
| Communal Water Points | MK90.00 |

## Water Consumption Prices (Commercial Charges)

| | | | |
|---|---|---|---|
| First 4 KL of water | MK643.63*4 | | |
| Additional 11 KL | MK1,036.31*11 | | |
| Excess | MK1,248.89* quantity of excess water | | |
| **Institutions** | | | |
| First 4 KL of water | MK643.63*4 | | |
| Additional 11 KL | MK814.87*11 | | |
| Excess | MK924.12* quantity of excess water | | |
| **Individual Household Consumers** | | | |
| First 4 KL of water | MK279.35*4 | | |
| Additional 11 KL | MK294.35*11 | | |
| Excess | MK9305.56* quantity of excess water | | |
| **Communal Water Points** | | | |
| First 0 to 4 KL of water | Minimum Service Charge of MK90.00 | | |
| Excess | MK90.00 per KL | | |

# Annex 4.

# Draft Water Purchase Agreement (WPA)

[NAME OF WATER PURCHASER]

- and -

[NAME OF WATER SUPPLIER]

---

# WATER PURCHASE AGREEMENT

relating to
the Irrigation project of Shire Valley
at Chikwawa

DATED AS OF [DATE]

***NOTES:***

This water purchaser agreement is presented as an example. The WPA to be negotiated will be different and will result from the negotiations. This model draws from many examples, some from the World Bank PPP web site.

THIS WATER PURCHASE AGREEMENT (this "Agreement") is made at [LOCATION] as of [DATE]

BETWEEN:

(1) [NAME OF WATER PURCHASER] ("Client"), a company duly incorporated under the Laws of Host Country and having its registered office at [LOCATION]; and

(2) [NAME OF WATER SUPPLIER] (the "Company"), a company duly incorporated under the Laws of [COUNTRY OF INCORPORATION] whose registered office is located at [LOCATION].

Both Client and the Company are herein referred to individually as a "Party" and collectively as the "Parties".

WHEREAS:

(A) the Company plans to design, finance, construct, own, operate and maintain a [BRIEFLY DESCRIBE PROJECT AND LOCATION OF PROJECT]; and

(B) the Company wishes to sell to Client, and Client wishes to purchase from the Company irrigation water pursuant to the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the mutual benefits to be derived and the representations and warranties, conditions and promises herein contained, and intending to be legally bound hereby, the Company and Client hereby agree as follows:

## 1. INTERPRETATION

In this Agreement:

1.1 expressions defined in Schedule 1 shall bear the respective meanings set out therein;

1.2 the headings and paragraph numbering are for convenience only and shall be ignored in construing this Agreement;

1.3 the singular includes the plural and vice versa;

1.4 terms not herein defined shall have the meanings ordinarily ascribed thereto in the Oxford English Dictionary;

1.5 references to Articles, Sections and Schedules are, unless the context otherwise requires, references to Articles, Sections of, and Schedules to, this Agreement;

1.6 references to any agreement, enactment, ordinance or regulation includes any amendment thereof or any replacement in whole or in part;

1.7 all references herein to time are to Host Country time;

1.8 words importing any gender include the other gender;

1.9 the words “include,” “includes” and “including” are not limiting; and

1.10 the words “hereof,” “herein,” and “hereunder” and words of similar import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement.

## 2. SALE AND PURCHASE OF WATER

Subject to and in accordance with the terms of this Agreement, the Company shall make available and sell to Client, and Client shall purchase from the Company for the consideration described in Article 9, the Volume of Water of the Complex from and after the Commercial Operations Date.

## 3. TERM

### 3.1 Initial Term

The initial term of this Agreement shall commence on the date hereof and shall end **[_____]** years from the Commercial Operations Date unless it is earlier terminated pursuant to the provisions of this Agreement. The termination of this Agreement shall be without prejudice to all rights and obligations of the Parties accrued under this Agreement prior to such termination.

### 3.2 Renewal Term

This Agreement may be extended for an additional period on terms mutually agreeable to the Company and Client.

## 4. PRE-OPERATION PERIOD

### 4.1 Permits and Licenses

The Company, at its sole cost and expense, shall: (a) acquire and maintain in effect all Consents required by all Public Sector Entities with jurisdiction over the Company and/or the Complex in order to enable it to perform its obligations under this Agreement; (b) give all required notices and allow all required inspections under all Consents obtained by it in connection with the Complex; and (c) pay all prescribed fees in connection with such Consents.

### 4.2 Submissions by the Company

The Company shall submit to Client the documents listed below on or before the dates specified ("WPA Original Documents") In addition, the Company shall provide to Client any documents supplementing or otherwise amending a WPA Original Document in a timely manner as such information is amended, modified or superseded (all such supplements and amendments, "WPA Amended Documents"). Prior to executing (a) any WPA Original Document or (b) any WPA Amended Document [that is material to the interests of Client under this Agreement], the Company shall obtain the written approval of Client[, which approval shall not be unreasonably withheld or delayed]; provided, however, that any approval requested from Client for a WPA Amended Document which is to be executed or otherwise created after Financial Closing shall be deemed given unless refused within [_____] Days after notice of the request for such approval, or, in the case of Change Orders, within [_____] Days after notice of the request for such approval.

4.2.1 As soon as available, but no later than Financial Closing, a copy of the Implementation Agreement as executed, with any amendments thereto;

4.2.2 On or before Financial Closing, a copy of the Construction Contract as executed, including all schedules, plans and specifications attached thereto, plus all amendments executed as of that date;

4.2.3 On or before Financial Closing, copies of all Consents and other governmental authorizations that have been issued to the Company to date for the design, financing, construction, ownership, operation and maintenance of the Complex, and not later than [_____] Days prior to the Commercial Operations Date, (a) evidence demonstrating that the Company has obtained all of the [material] Consents then required to be obtained for the ownership, operation and maintenance of, and the supply of Water from, the Complex together with (b) a list identifying Consents not yet required to be obtained for the operation and maintenance of, and the supply of Water from, the Complex, together with a plan reasonably acceptable to Client for obtaining such Consents and an estimate of the time within which such Consents will be obtained;

4.2.4 On or before Financial Closing, a copy of the Company's proposed plan for the operations and maintenance of the Complex or an O&M Contract entered into by the Company, together with all amendments executed as of that date;

4.2.5 As soon as available, copies of any contracts executed with Direct Contractors;

4.2.6 As soon as available, but no later than the Financial Closing, the Company shall provide Client with any environmental assessment or study relating to the Complex that has been provided to the Company or to its Lenders; At least [_____] Days prior to Commencement of Construction, evidence demonstrating that the Company has, or the Construction Contractor or other Contractors have, obtained all material Consents that are necessary for the Commencement of Construction;

4.2.9 Beginning within [_____] Days after Financial Closing and ending on the Commercial Operations Date, (a) monthly progress reports substantially in the form set forth in Schedule 7 (or such other form as may be agreed to by the

Parties), such other reports as are submitted to the Company by the Technical Agent and (c) reports, when and as the Company becomes aware, of any new condition or event which will have a material and adverse effect on the timely completion of the Complex;

4.2.10 As soon as available but not later than [_____] Days after Financial Closing, general arrangement drawings for the construction of the Complex;

4.2.11 Not later than [_____] Days prior to the scheduled commencement of testing and Commissioning, a start-up and test schedule for the Complex;

4.2.12 Not later than [_____] Days prior to the Required Commercial Operations Date, a copy of draft written operating procedures to serve as the basis for the written operating procedures to be jointly developed pursuant to Section 4.3.1;

4.2.13 As soon as available but not later than the Commercial Operations Date, final design drawings for the construction of the Complex;

4.2.14 As soon as available but not later than [_____] Days after the Commercial Operations Date, copies of all test results for tests performed on the Complex;

4.2.15 As soon as available but not later than the Commercial Operations Date, a certificate signed by the Technical Agent stating that he has supervised the design and construction of the Complex in accordance with Prudent Client Practice and that, to the best of his knowledge, such design and construction has been completed consistent with the terms of this Agreement (including the Minimum Functional Specifications), the Implementation Agreement, the Construction Contract, the final design drawings and Prudent Client Practice, and that the Complex will have a useful life of at least [_____] years;

4.2.16 Not later than [_____] Days following the Commercial Operations Date, (a) for the major items of equipment incorporated into the Complex, copies as received by the Company under the Construction Contract of all the manufacturers' specifications and manufacturers' operation

manuals, and (b) a certificate of the Technical Agent attesting to the fact that all equipment is new and unused; and

4.2.17 As soon as available but not later than [_____] months after the Commercial Operations Date, as-built drawings and complete specifications for the Complex.

Neither the receipt nor approval of any WPA Original Document or WPA Amended Document shall (a) relieve the Company of any liability, obligation or responsibility under this Agreement or the Implementation Agreement resulting from a breach by the Company or its Contractors of this Agreement or the Implementation Agreement, or (b) be construed as an endorsement by Client of the design, financing, construction, ownership, operation or maintenance of the Complex nor as a warranty by Client of the safety, durability or reliability thereof.

4.3 Operating Procedures

The Company and Client shall jointly develop written operating procedures for the Complex no later than [_____] Days prior to the Required Commercial Operations Date. Such operating procedures shall be based on the designs of the Complex, the Interconnection Facilities and the Client irrigation network System and on the draft procedures provided by the Company pursuant to Section 4.2.12; shall be consistent with the Minimum Functional Specifications; and shall deal with all operational interfaces between Client and the Company, including method of day-to-day communication, key personnel lists, flow reporting, operations log. The written operating procedures shall be subject to the prior written consent of Client, which consent shall not be unreasonably withheld or delayed.

4.5 Inspection

Client and/or its representatives shall have the right to observe the progress of the construction of the Complex and the testing and Commissioning of the Complex in accordance with Schedule 4. The Company shall comply with all reasonable requests of Client for, and assist in arranging, any such observation visits to the Complex. Such visits to the Complex shall not be construed as an endorsement by Client of the design thereof nor as a warranty by Client of the safety, durability or reliability of the Complex.

4.6 Access to Site

Upon reasonable prior notice from the Company and at reasonable times, Client shall grant the Company reasonable access to any lands owned by Client that are necessary for designing, financing, constructing, operating and maintaining the Complex.

4.7 General Covenants of the Company in respect of the Complex

The Company hereby covenants as follows:

4.7.1 during the term of this Agreement, the Company shall design, finance, construct, own, operate and maintain the Complex in accordance with (a) this Agreement, (b) the Minimum Functional Specifications set forth in Schedule 2, (c) sound engineering and construction practices and Prudent Client Practice, (d) the operating procedures developed pursuant to Section 4.3, (e) the environmental guidelines and occupational health and safety standards of [Host Country], (f) all applicable Consents and Laws and (g) such requirements as Client may reasonably deem necessary in order for the Interconnection Facilities to be designed and constructed in accordance with sound engineering and construction practices and Prudent Client Practice;

4.7.2 the Complex will be designed, constructed and completed (a) in a good and workmanlike manner, only with materials and equipment that are new, Client grade and suitable for their intended use; (b) in such a manner as to provide that the useful life of the Complex, with proper operation and maintenance, will be at least equal to [_____] years; and (c) in accordance in all material respects with sound engineering and construction practices and Prudent Client Practice;

4.7.3 the Company shall Commission the Complex on or before the Required Commercial Operations Date; and

4.7.4 During the term of this Agreement, the Company shall maintain the Site in a clean and presentable manner.

## 5. REPRESENTATIONS AND WARRANTIES OF THE COMPANY

The Company represents and warrants to Client that:

5.1 the Company is duly incorporated, validly existing and has complied fully with all requirements of the [LOCAL COMPANIES ACT OR CORPORATE CODE] and all other applicable Laws of Host Country;

5.2 the Company has full power to carry on its business and to enter into, legally bind itself by, and perform its obligations under, this Agreement and the other agreements comprising the Security Package;

5.3 this Agreement has been duly authorized, executed, and delivered by the Company and constitutes its legal, valid and binding obligation;

5.4 the execution, delivery, and performance of this Agreement and each agreement comprising the Security Package does not, and will not, constitute a violation of (a) any statute, judgment, order, decree or regulation or rule of any court, governmental authority or arbitrator of competent jurisdiction applicable or relating to the Company, its assets or its businesses, or (b) the Company's [NAME OF PRIMARY ORGANIC DOCUMENTS, E.G., ARTICLES OF ASSOCIATION] or other organic documents or any indenture, contract or agreement to which it is a party or by which it or its property may be bound;

5.5 there are no outstanding judgments against the Company, and, to the best knowledge of the Company, no action, claim, suit or proceeding is pending or threatened against the Company before any court, governmental authority or arbitrator of competent jurisdiction that could reasonably be expected to affect materially and adversely the financial condition or operations of the Company or the ability of the Company to perform its obligations under this Agreement or any other agreement comprising the Security Package or which purports to affect the legality, validity or enforceability of this Agreement or any other agreement comprising the Security Package;

5.6 the Company is not in default under any agreement to which it is a party or by which it or its property may be bound, nor in any default of any technical or financial obligation, which could have a material adverse effect on the ability of the Company to perform its obligations under this Agreement or any other agreement comprising the Security Package; and

5.7 no information given by the Company in relation to this Agreement or any agreement in the Security Package or in the proposal submitted by the Company to Client contains any misstatement of fact or omits to state a fact which would be materially adverse to the enforcement of the rights and remedies of Client or which would be necessary to make any statement, representation or warranty contained herein or therein true and correct in all material respects.

## 6. OPERATION AND MAINTENANCE OF THE COMPLEX

6.1 Dispatch by Client

6.1.1 Subject to the Minimum Functional Specifications and approved Scheduled Interruptions and Maintenance Interruptions, Client shall have the right to Dispatch the Complex in accordance with the provisions of this Section 6.1. From and after the Commercial Operations Date, Client may Dispatch the Complex up to its Dependable Capacity.

6.1.2 At least [_____] Days prior to the [_____] Day of each Month commencing with the Month in which the Commercial Operations Date is expected to occur, Client shall provide to the Company a projected water flow profile indicating the anticipated operating level for the Complex for each day of the forthcoming Month. Client shall use its reasonable endeavors to revise said monthly projected profile, if necessary, by [TIME] each [DAY OF THE WEEK]. The Parties agree and acknowledge that the actual Dispatch schedule may be substantially different from the projected load profiles provided previously. It is expressly recognized that Client is not obligated to request any net amount of water.

6.2 Operation by the Company

6.2.1 Provided such Dispatch is in accordance with the terms of this Agreement, from and after the Commercial Operations Date, Company shall control and operate the Complex in accordance with Client's Dispatch instructions.

6.2.2 Subject to the Minimum Functional Specifications, the Company shall operate and maintain the Complex in such a manner so as not to have an adverse effect on Client's irrigation flows and distribution system.

6.3 Scheduled Interruptions

6.3.1 At least [_____] Days prior to the Scheduled Commercial Operations Date, the Company shall submit to Client its desired schedule of Scheduled Interruptions periods for the remainder of the Year in which the Scheduled Commercial Operations Date occurs. Thereafter, by [DATE] of each Year after the Year in which the Scheduled Commercial Operation Date occurs, the Company shall submit to Client its desired schedule of Scheduled Interruption periods for the following Year.

6.3.2 At least [_____] Days prior to the Scheduled Commercial Operations Date and [_____] Months prior to the commencement of each Year after the Year in which the Scheduled Commercial Operation Date occurs, Client shall notify the Company in writing whether the requested Scheduled Interruption periods are acceptable. If Client cannot accept any of the requested Scheduled Interruption periods, Client shall advise the Company of a period when Client determines such unacceptable Scheduled Interruption period can be rescheduled. Such rescheduled period shall be as close as reasonably practicable to the requested period, shall comply with the Minimum Functional Specifications, and shall be of equal duration as the requested period. The Company shall conduct Scheduled Interruptions only during periods agreed to in writing by Client as aforesaid.

6.3.3 Commencing with the Commercial Operations Date, the Company may not schedule more than a total of [_____] Complex Hours of Scheduled Interruptions during any Operating Year.

6.3.4 Client may, upon [_____] Days prior written notice, require the Company to reschedule a Scheduled Interruption; provided, however, that Client shall not request that such Scheduled Interruption be rescheduled in a manner or time outside the Minimum Functional Specifications.

6.3.5 Client shall use its reasonable endeavors to coordinate its maintenance program for the Interconnection Facilities with the approved Scheduled Interruptions so as to minimize any disruption to the operation of the Complex.

6.4 Maintenance Interruptions

When the circumstances warrant a Maintenance Interruption, the Company may advise Client of such circumstances and of the commencement and estimated duration of the Maintenance Interruption. Client shall grant the Company the right to conduct such Maintenance Interruption at a time reasonably acceptable to Client.

6.5 Emergencies

6.5.1 Client and the Company shall jointly establish plans for operating the Complex during an Emergency. The Company shall, within the Minimum Functional Specifications, comply with such Emergency procedures.

6.5.2 During an Emergency and if requested in Dispatch instructions from Client, the Company shall supply such water as the Complex thereafter is able to deliver within the Minimum Functional Specifications. If the Complex has a Scheduled Interruption or a Maintenance Interruption and such Scheduled Interruption or Maintenance Interruption occurs or would occur coincident with an Emergency, the Company shall use its reasonable efforts to reschedule the Scheduled Interruption or Maintenance Interruption or, if the Scheduled Interruption or Maintenance Interruption has begun, to expedite the completion of the work to restore water supply as soon as possible.

6.6 Cessation of Operation or Abandonment by the Company

Notwithstanding any other provision of this Agreement, if the Company shall have ceased to operate the Complex for [_____] consecutive hours without the prior written consent of Client, other than because of (a) an event of Force Majeure, (b) a Forced Interruption, Scheduled Interruption or Maintenance Interruption, (c) a breach by Client of this Agreement, or (d) Dispatch instructions from Client, then Client shall be entitled to enter the Site and operate the Complex using the same operating standards which it uses to until the Company demonstrates to the reasonable satisfaction of Client that it can and will resume normal operations of the Complex. During any period that Client shall operate the Complex pursuant to this Section, the Company shall be paid only the debt service element of the Capacity Payment and shall not be entitled to any other Capacity Payments or Water Payments. Notwithstanding the provisions of Section 12.2, Client shall only indemnify and hold the Company harmless from any loss or damage to the Complex for losses, claims, damages or liabilities incurred, suffered or sustained by the Company by reason of Client's negligence or willful misconduct in the operation of the Complex during such period, and then only to the extent that such loss or damage is not covered by insurance.

6.8 Employment of Qualified Personnel

The Company shall only employ personnel (management, supervisory and otherwise) who are qualified and experienced for operating and monitoring the Complex and for coordinating operations of the Complex with the Client Irrigation System. The Company shall ensure that such personnel are on duty at the Complex at all times, twenty-four (24) hours a Day and seven (7) Days a Week commencing with the date on which water delivered by the Complex.

6.9 Operating Committee Membership and Duties

6.9.1 On or before [_____] Months prior to the Scheduled Commercial Operations Date, the Parties shall establish an

Operating Committee comprising [_____] members. Each Party shall designate [HALF] members to represent it on the Operating Committee, and either Party may remove or replace any of its Operating Committee members at any time upon notice to the other Party. The Operating Committee shall develop procedures for the holding of meetings, the keeping of minutes of meetings and the appointment and operation of sub-committees. The chairmanship of the Operating Committee shall rotate each six (6) Months between the Parties and the Parties agree that the first chairman shall be nominated by Client. Decisions of the Operating Committee shall require the approval of a majority of members of the Operating Committee.

6.9.2 The Operating Committee shall be responsible for developing the operating procedures to be developed pursuant to Section 4.3 (and any subsequent revisions thereto); for approving procedures for the Commissioning of the Complex pursuant to Article 10 and Schedule 4; for establishing other procedures relating to the interaction of the Complex, the Metering System, the Interconnection Facilities and the Client Irrigation System; and, where appropriate, for proposing solutions to other issues and attempting to resolve Disputes concerning the operation, maintenance and testing of the Complex. These matters shall include:

(a) the coordination of the respective programs and procedures of the Parties for the construction, commissioning and operation of the Interconnection Facilities, the Metering System and the Complex, and agreement where necessary upon the respective commissioning procedures;

(b) the discussion of the steps to be taken on the occurrence of any Force Majeure, or the shutdown or reduction in capacity for any other reason of the Interconnection Facilities or the Complex;

(c) the coordination of Scheduled Interruptions;

(d) safety matters affecting the Complex, the Parties or their Contractors;

(e) clarification of Emergency plans developed pursuant to Section 6.5.1 for recovery from a local or widespread water delivery failure;

(f) review and revision, subject to Client approval, of protection schemes; and

(g) any other matter mutually agreed to by the Parties.

6.9.3 The Parties shall instruct their representatives on the Operating Committee to act in good faith in dealing with matters considered by the Operating Committee. The Parties shall consider and use reasonable efforts to incorporate decisions of the Operating Committee in the operation and maintenance of the Complex and the Interconnection Facilities. The Operating Committee on its own shall not (a) override or waive any provisions of this Agreement or (b) amend or modify any provisions of this Agreement.

6.10 Inspections and Records

6.10.1 Client shall have the right to visit and observe the Complex and/or the operation thereof upon reasonable advance notice to the Company. Such visits and observation shall not be construed as an endorsement by Client of the design of the Complex nor as a warranty by Client of the safety, durability or reliability thereof.

6.10.2 Each Party shall keep complete and accurate records and all other
6.10.3 Data required by each of them for the purposes of proper administration of this Agreement. Among other records and data, the Company shall maintain an accurate and up-to-date operating log in a format reasonably acceptable to Client which log shall include records of:

(a) Water flows and water volume distributed.

(b) changes in operating status, Scheduled Interruptions, Maintenance Interruptions and Forced Interruptions;

(c) any unusual conditions found during inspections; and

(d) other matters agreed to by the Operating Committee.

Either Party shall have the right, upon reasonable prior written notice to the other Party, to examine and/or make copies of the records and data of the other Party relating to this Agreement at any time during normal office hours during the period such records and data are required to be maintained. All such records shall be maintained for a minimum of [_____] Months after the creation of such record or data and for any additional length of time required by regulatory agencies with jurisdiction over the Parties. Upon expiration of such [_____] Month period, neither Party shall dispose of or destroy any such records without [_____] Days prior written notice (generally describing the records or data to be destroyed or disposed of) to the other Party, and the Party receiving such notice may receive such records in lieu of such disposal or destruction by giving the notifying Party notice [_____] Days prior to the expiration of the [_____] Day period.

6.11 Periodic Reports

6.11.2 The Company shall, as soon as available but in any event within [_____] Days after the end of each Financial Year, furnish to Client: (a) [_____] copies of its complete financial statement for such Financial Year (which are in agreement with its books of accounts and prepared in accordance with accounting principles which are generally accepted in Host Country and consistently applied), together with an audited report thereon, all in accordance with the requirements of the [LOCAL COMPANIES ACT OR CORPORATE CODE]; (b) a copy of any management letter or other communication sent by the auditors to the Company or to its management in relation to the Company's financial, accounting and other systems, management and accounts; (c) a report by the auditors certifying that, based on its said financial statements, the Company was in compliance with its financial obligations under the Loan Documents as of the end of the relevant Financial Year or, as the case may be, detailing any non-compliance. In addition, the Company shall authorize its auditors (whose fees and expenses shall be for the account of the Company) to communicate directly with Client at any

time regarding the Company's accounts and operations and shall furnish to Client a copy of such authorization.

6.11.3 The Company shall, as soon as available but in any event within [_____] Days after the end of each [_____] Month period of each Financial Year, furnish to Client: (a) [_____] copies of the Company's complete financial statements for such [_____] Month period, all in accordance with accounting principles which are generally accepted in Host Country and consistently applied, and, if requested by Client, certified by an officer of the Company; and (b) a report on any factors materially and adversely affecting or which might materially and adversely affect the Company's business and operations or its financial condition.

## 7. INTERCONNECTION

7.1 Client Responsibilities

7.1.1 Client shall design, construct, install, commission, operate and maintain the Interconnection Facilities (excluding the equipment referred to in Section 8.1.2) in accordance with the terms of this Agreement and Schedule 3, and Client shall own all such Interconnection Facilities.

7.1.2 Upon completion of the Interconnection Facilities described in Section 7.1.1, Client shall test such Interconnection Facilities in accordance with the procedures set forth in Schedule 4.

7.1.3 Client shall complete construction of the Interconnection Facilities [_____] Days prior to the Scheduled Commercial Operations Date; provided, however, that such date shall be extended day-for-day in the event that the monthly progress reports of the Company and/or the construction schedule for the Complex, as revised from time to time, projects a delay in the Scheduled Commercial Operations Date.

7.1.4 If Client fails to complete the Interconnection Facilities by the date specified in Section 7.1.3, the Required Commercial Operations Date shall be extended day-for-day for each Day that the Interconnection Facilities are delayed beyond that

date, and the Company shall be entitled to no other damages or relief therefor except as provided in Section 7.3.

7.2 Company Responsibilities

7.2.1 The Company shall permit Client such access to the Complex as Client shall require for the design, construction, installation, commissioning, operation and maintenance of the Interconnection Facilities, and the Company shall cooperate with Client in the design, construction, installation, commissioning, operation and maintenance and testing thereof.

7.2.2 The Company shall be responsible for designing, constructing, installing, commissioning, operating and maintaining all auxiliary and interconnecting equipment on the Company's side of the Interconnection Point, and the Company shall own all such auxiliary and interconnection equipment.

7.3 Delay in Completion of Interconnection Facilities

7.3.2 If Client has not completed the Interconnection Facilities by the date specified in Section 7.1.3 or such later date as may be determined by the Parties in accordance with this Agreement, and the Technical Agent witnesses the [no-load] tests specified in Section [_____] of Schedule 4 and, in his reasonable judgment, certifies on the day of the [no-load] tests that the Complex has satisfied the requirements specified in Section [_____] of Schedule 4, then Client shall pay to the Company as liquidated damages [AMOUNT], [as adjusted from time to time in accordance with Schedule 6,] for each Day on which the Interconnection Facilities are not completed after the date specified in Section 7.1.3 or such later date as determined by the Parties in accordance with this Agreement. Notwithstanding any other provision of this Section 7.3.1, the cumulative amount of the liquidated damages payable to the Company under this Section 7.3.1 shall not exceed a cumulative amount equivalent to [AMOUNT].

7.3.3 When Client completes the Interconnection Facilities, an authorized representative of Client shall certify in writing to the Company, that the Interconnection Facilities have been completed in accordance with the requirements of this Agreement and are ready to begin receiving water. Client shall promptly provide to the Company copies of the results

of all tests and procedures (and supporting data) conducted by or for Client in connection with the construction, completion and testing of the Interconnection Facilities, which results shall be certified by an authorized representative of Client as complete and correct. In addition, if Client has contracted with a third party contractor for the construction, completion or testing of the Interconnection Facilities, Client shall promptly furnish to the Company copies of any of such contractor's completion certificate(s) and any of Client's acceptance certificate(s) as may be issued in respect of such construction, completion and testing. Commencing with the date on which Client provides the Company with the certificates and other documents set forth in this Section 7.3.2, Client shall bear no further liability for liquidated damages under Section 7.3.1, and the Company shall proceed promptly with testing and Commissioning in accordance with Article 10 and Schedule 4.

7.4 Testing of Interconnection Facilities

The Parties shall cooperate in testing the Interconnection Facilities in accordance with Schedule 3 and the schedule developed by the Operating Committee (but in no event later than the time provided in Section 7.1.3) and at such other times thereafter as either Party may reasonably require. Each Party shall bear its own costs in connection with any such testing.

## 8. METERING

8.1 Ownership of Metering Equipment

8.1.1 Client, at its expense, shall own, procure, operate and maintain the Metering System in accordance with Schedule 5.

8.1.2 The Company, at its expense shall design, finance, construct, install, own, operate and maintain meters and metering devices for backup purposes pursuant to Schedule 5 (“Backup Metering System”) in addition to the Metering System.

8.2 Installation of Metering System

The Company shall install the Metering System on the Site, and Client shall reimburse the Company for all reasonable expenses incurred by the Company for the installation thereof. Client shall provide the Metering System ready to be installed and such installation instructions from Client in writing on a timely

basis as may be required to allow the Company to install such equipment by the date required for the completion of the Interconnection Facilities under Section 7.3 and for Client to test the Metering System under Section 8.3. Such installation shall be inspected by, and subject to the approval of, Client[, which approval may not be unreasonably withheld or delayed].

8.3 Testing and Inspection of Metering System

Client shall inspect and test at its own expense the Metering System for accuracy in accordance with Schedule 5 by the date required for the completion of the Interconnection Facilities under Section 7.1.3, and thereafter at intervals of not less than [_____] Days. With respect to each testing of the Metering System, Client shall give the Company no less than [_____] hours advance notice of such testing, and the Company may have a representative present during any such testing, as well as during any inspection of the Metering System or adjustment thereof (but the test, inspection or adjustment may be taken if the Company has no representative present).

8.4 Measurement of Net Water Delivered

8.4.1 Client shall read the Metering System Monthly on the [_____] Business Day of each Month (or such other Day as may be agreed upon by the Operating Committee) for the purpose of measuring the Net Water Delivered. Client shall give the Company not less than [_____] hours notice of its intention to read the Metering System. The Company shall have the right to have a representative present during any such reading (but the reading may be taken if the Company has no representative present). Client shall take and record such reading together with a photographic record thereof, and Client shall maintain a log of all such meter readings.

8.4.2 When, as a result of any test pursuant to Section 8.3, the Metering System is found to be inaccurate by more than [_____] percent or is otherwise functioning improperly, then the correct amount of Net Water Delivered to Client for the actual period during which inaccurate measurements were made, if any, shall be determined as follows:

(a) first, the readings of the Backup Metering System, if any, shall be utilized to calculate the correct amount of Net Water Delivered, unless a test of such Backup Metering System, as required by either Party, reveals that the Backup Metering System is inaccurate by more than

[_____] percent or is otherwise functioning improperly;

(b) if the Backup Metering System is not within the acceptable limits of accuracy or is otherwise functioning improperly, then the Company and Client shall jointly prepare an estimate of the correct reading on the basis of all available information including deliveries of Net Water Delivered during periods of similar operating conditions when the Metering System was registering accurately;

(c) in the event that the Parties cannot agree on the actual period during which inaccurate measurements were made, the period during which measurements are to be adjusted shall be the shorter of (i) one-half of the period from the last previous test of the Metering System, or (ii) [_____] Days immediately preceding the test which found the Metering System to be inaccurate; and

(d) the difference between the previous payments by Client for the period of inaccuracy or improper functioning and the recalculated amount shall be offset against or added to the next payment to the Company under this Agreement, as appropriate.

In the event that Client and the Company fail to agree upon any estimate pursuant to this Section 8.4.2, then the matter may be referred by either Party for determination by an expert pursuant to Section 16.2.

8.5 Sealing, Repair and Replacement of Meters

8.5.1 The Metering System and the Backup Metering System shall comply with Schedule 5 and shall be jointly sealed. Such seals shall be broken only by Client personnel in the presence of personnel from the Company when the Metering System or the Backup Metering System is to be inspected, tested or adjusted.

8.5.2 When any component of the Metering System is found to be outside acceptable limits of accuracy or otherwise not functioning properly, Client shall forthwith repair, recalibrate or replace such component of the Metering System. Similarly, when any component of the Backup Metering System is found to be outside acceptable limits of accuracy or otherwise not functioning properly, the Company shall forthwith repair, recalibrate or replace such component of the Backup Metering System. Upon the completion of any examination, maintenance, repair or recalibration of, or replacement of any component in, the Metering System or the Backup Metering System, the relevant metering system shall be jointly sealed.

## 9. COMPENSATION, PAYMENT AND BILLING

9.1 Capacity Payment

9.1.1 Beginning on the Commercial Operations Date, Client shall pay to the Company each Month, in arrears on the [_____] Business Day of each Month, an amount equal to the Capacity Payment in accordance with Section 9.6.45 For each Month, the "Capacity Payment" shall be equal to the product of the Capacity Purchase Price and the Dependable Flow.

9.1.2 The amount of the Capacity Purchase Price shall be as set forth in Schedule 6 and shall be adjusted from time to time in accordance with Schedule 6.

9.2 Water Payment

9.2.1 During the Commissioning of the Complex, in accordance with Section 9.6, Client shall pay to the Company, in arrears on the [_____] Business Day of each Month, for each cubic meter of Water Delivered from the Complex to Client during the preceding Month, an amount equal to the Company's costs for transporting the water.

9.2.2 After the Commercial Operations Date, in accordance with Section 9.6, Client shall pay to the Company, in arrears on the [_____] Business Day of each Month, the Water Purchase Price for each cubic meter of Net Water Delivered from the Complex to Client during the preceding Month (each Monthly payment, an "Water Payment").

9.2.3 The amount of the Water Purchase Price shall be as set forth in Schedule 6 and shall be adjusted from time to time in accordance with Schedule 6.

9.3 Liquidated Damages

9.3.1 Delays in Commissioning

If the Complex shall not have been Commissioned on or before the Required Commercial Operations Date, then the Company shall pay to Client [AMOUNT] for each Day by which the Complex is delayed beyond its Required Commercial Operations Date; provided, however, that the cumulative amount of such payments shall not exceed [AMOUNT]. These payments shall be liquidated damages for the detrimental impact of such delay upon Client's generation planning.

9.3.2 Shortfalls in Commissioned Dependable Capacity

If there is a Commissioned Shortfall, then the Company shall pay to Client as liquidated damages for the detrimental impact upon Client's water delivery planning [AMOUNT] per cubic meter of such Commissioned Shortfall.

9.3.3 On-Going Dependable Capacity Shortfalls

If after the Commercial Operations Date, there is an On-Going Dependable Capacity Shortfall, then the Company shall pay to Client, as liquidated damages [AMOUNT] for each cubic meter per month of such On-Going Dependable Capacity Shortfall until the next testing of Dependable Capacity which may be requested by the Company pursuant to Article 10 and Schedule 4.

9.3.4 Dispatch Levels

From and after the Commercial Operations Date, in the event that after [_____] identical Dispatch requests separated by a sufficient period of time for the Company to have complied with the first request based on ramp time schedules as provided in the Minimum Functional Specifications, the Company does not achieve the operating level requested by Client pursuant to Section 6.1 within the time allowed by the Minimum Functional Specifications, within a tolerance of plus or minus [_____] percent, then the Company shall pay to Client, as liquidated damages [AMOUNT] per $m^3$ for each $m^3$ outside the tolerance; provided, however, that Client shall not be entitled to liquidated damages pursuant to this Section 9.3.4 if the requested operating

level cannot be achieved within the Minimum Functional Specifications or is above the Declared Available Capacity of the Complex (as adjusted by Forced Interruptions declared subsequent to such Dispatch requests).

9.3.5 Adjustment

The amounts of all of the liquidated damages set forth in Section 9.3 shall be adjusted from time to time in accordance with Schedule 6.

9.3.6 Waiver of Defenses

The Parties agree that Client may be substantially damaged in amounts that may be difficult or impossible to determine in the event that the Complex or any part thereof (a) is not in service by the dates required, (b) is not capable of achieving and maintaining the expected Dependable Capacity, or (c) cannot achieve the designated operating levels. The Parties also agree that the Company may be substantially damaged in amounts that may be difficult or impossible to determine in the event that the Interconnection Facilities are not in service by the date required. Therefore, to the limited extent set out in this Agreement, the Parties have agreed on sums that the Parties agree are reasonable as liquidated damages. It is further understood that the payment of liquidated damages is in lieu of actual damages for the occurrences defined in the first two sentences of this Section 9.3.6, and that the payment of liquidated damages under Sections 7.3 and 9.3.1 through 9.3.4 shall be the exclusive remedy of Client or the Company, as appropriate, for such occurrences unless and until (a) the Company has committed a Company Event of Default within the meaning of Section 15.1.14 in the case of liquidated damages payable to Client and (b) Client has committed a Client Event of Default within the meaning of Section 15.2.3 in the case of liquidated damages payable to the Company. The Company and Client hereby waive any defense as to the validity of any liquidated damages in this Agreement on the grounds that such liquidated damages are void as penalties.

9.4 Security

9.4.1 Construction Security

On or before Financial Closing, the Company shall provide to Client security (the "Construction Security") in the amount of [AMOUNT] to ensure completion of the Complex by the Required Commercial Operations Date. The Construction Security shall be an unconditional and irrevocable direct pay letter of credit issued by a bank acceptable

to Client in form and substance satisfactory to Client. The Construction Security and any interest accrued thereon may be applied to the payment of liquidated damages or other Damages and accrued interest thereon as set forth in Section 9.5. There shall be no discontinuity between the expiration of the Construction Security and the effectiveness of the Operations Security, and the Construction Security shall be returned to the Company promptly following delivery to Client of the Operations Security and the occurrence of the effective date of the Operations Security.

9.4.2 Operations Security

(a) On the Commercial Operations Date, the Company shall provide to Client security (the "Operations Security") in the amount of [AMOUNT] to ensure the completion and proper operation and maintenance of the Complex The Operations Security shall be an unconditional and irrevocable direct pay letter of credit issued by a bank acceptable to Client in form and substance satisfactory to Client. The amount of the Operations Security shall be adjusted from time to time in accordance with Schedule 6.

(b) The Operations Security may be applied to (i) the payment of liquidated damages and accrued interest thereon in accordance with Section 9.5; (ii) the repayment to Client of amounts improperly drawn by the Company under the Letter of Credit, together with interest thereon as set forth in Section 9.7.4; and (iii) the payment of other Damages and interest that the Company shall be required to pay to Client.

(c) Except as expressly provided in this Agreement, the Company shall maintain the Operations Security at the level designated in subsection (a) at all times; provided, however, that the Company may have [_____] Days from the date Client gives notice to the Company that it has retained or collected funds from

the Operations Security pursuant to this Section 9.4.2 to replenish the Operations Security so as to return it to the required level, as escalated.

(d) Upon termination of this Agreement, Client shall be entitled to retain or collect, as the case may be, from the Operations Security any damages or moneys then due or reasonably expected to be due to Client by the Company and shall pay or return to the Company the remainder of the Operations Security and accrued interest, if any. If, upon the termination of this Agreement, there shall be any dispute between the Company and Client that has been referred to an expert for determination or is being arbitrated pursuant to the Agreement, then Client shall be entitled to retain or collect, as the case may be, from the Operations Security, an amount equal to the damages or moneys that Client, in its reasonable judgment, deems sufficient to satisfy any amount that may be due to Client by reason of such dispute. Upon settlement or resolution of the dispute, Client shall pay or return to the Company the remaining amount of Operations Security.

9.5 Payment of Liquidated Damages

Within [_____] Days after the end of each Month, Client shall compute and advise the Company by written notice (a "Liquidated Damages Notice") of the amount of liquidated damages due to Client pursuant to this Agreement for the preceding Month. The Company shall pay to Client, or direct Client to apply the Construction Security or Operation Security (as the case may be) to, the amount of liquidated damages shown on the Liquidated Damages Notice within [_____] Days after delivery of the Liquidated Damages Notice (the "Liquidated Damages Due Date"), and interest shall accrue on any unpaid amount from the Liquidated Damages Due Date at the Default Rate. Unless the entire amount of liquidated damages reflected on the Liquidated Damages Notice is paid to Client by the Company, the amount of such liquidated damages plus accrued interest due to Client shall be set off against amounts owed the Company by Client on the next statement(s) submitted to the Company pursuant to Section 9.6.

9.6 Payment and Billing

9.6.1 Within [_____] Days after the end of each Month, Client shall prepare and deliver to the Company a statement reflecting amounts payable to each Party by the other Party pursuant to this Agreement. Such statement shall include calculations, in reasonable detail, of such amounts owed to the Company for Capacity Payments, Water Payments, [Supplemental Payments] and liquidated damages and amounts owed to Client including liquidated damages, in accordance with this Agreement and the procedures determined by the Operating Committee. The statement shall be accompanied by any payment owed to the Company. Any payment which is not paid when due shall bear interest at the Default Rate.

9.6.2 If the Company shall dispute any portion of such statement, then the Company shall, within [_____] Days of the receipt of such statement, serve a notice on Client indicating the amount of the dispute and the basis therefor (a "Dispute Notice"). The dispute shall be settled by mutual discussion and, if necessary, referral to an expert pursuant to Sections 16.1 and 16.2. If it is determined that Client owes an amount of money to the Company, Client shall, within [_____] Days after the receipt of such determination, pay such sum together with interest thereon at the Default Rate from the date Client should have paid such sum to the Company.

9.6.3 At any time prior to [_____] Days after the end of a Year, or within such other period as permitted or required by applicable law, either Party may serve a Dispute Notice on the other Party that the amount of any statement submitted by Client during the preceding Year is in dispute. Each Dispute Notice shall specify the statement concerned, the amount of the dispute and the basis therefor. The dispute shall be settled by mutual discussion and, if necessary, referral to an expert pursuant to Sections 16.1 and 16.2. Upon resolution of the dispute, the Party which is determined to owe money to the other Party shall immediately pay such sum to the other Party together with interest thereon at the Default Rate from the date such payment should have been made.

9.7 Letter of Credit

9.7.1 Client shall establish irrevocable, revolving Letters of Credit substantially in the form set forth in Schedule 9 with respect to amounts payable by Client to the Company pursuant to Sections 9.1 and 9.2. Each Letter of Credit shall remain in place for twelve(12) months.

9.7.2 The first such Letter of Credit shall be established on or before the Commercial Operations Date. Client shall renew or replace this Letter of Credit and each succeeding Letter of Credit not less than [_____] Days prior to its expiration. Each such Letter of Credit shall be established in an amount necessary to meet [_____] Months' average projected Capacity Payments and Water Payments [and Supplemental Payments], which amount shall be determined by Client based upon (a) the estimated Dispatch requirements for the Complex notified to the Company by Client pursuant to Section 6.1 and the operating procedures developed in accordance with Section 4.3 and (b) the estimated adjustments to be made to the Capacity Purchase Price and the Water Purchase Price pursuant to Schedule 6 using index data available for the last preceding twelve Month period. As and when new index data becomes available or Client's requirements of Net Water Output [materially] change from its projections, either Party may request that the amount of the outstanding Letter of Credit be adjusted accordingly.

9.7.3 The Letter of Credit may be drawn on by the Company upon presentation to the bank of a copy of a statement delivered by Client to the Company pursuant to Section 9.6 of this Agreement at least [_____] Days prior to such presentation to the bank together with a certificate signed by a duly authorized officer of the Company attesting to the fact that Client has failed to pay all or part of the amount indicated on the statement. If Client has not delivered a statement to the Company pursuant to Section 9.6 of this Agreement within [_____] Days after the end of any Month, then the Company may, in lieu of the statement and certificate referred to in the first sentence of this Section 9.7.3, submit to Client a statement prepared by the Company in the manner described in Section 9.6 from meter readings taken by the Company. If Client fails to pay all or part of the amount indicated on the Company's statement within [_____] Days after receipt of such statement, the Company may submit to the bank a copy of such statement, together with a

certificate signed by a duly authorized officer of the Company attesting to the fact that (a) Client has failed to prepare a statement for such Month, (b) the statement prepared by the Company is a true and correct statement of amounts owed to the Company by Client for Dependable Capacity and Net Water Output delivered to Client during the preceding Month, and (c) Client has failed to pay all or part of the amount indicated on the statement.

9.7.4 In the event that the Company shall draw against a Letter of Credit and it shall later be determined that the Company was not entitled to do so, then the Company shall repay such amount to Client, together with all costs and expenses incurred by Client in connection with such drawing, plus interest on such amount and expenses from the date of payment at the Default Rate. Client shall have the right to set-off such amounts owed to Client by the Company against Capacity Payments and Water Payments [and Supplemental Payments].

## 11. INSURANCE

11.1 Insurance Coverage

At all times during the term of this Agreement, the Company shall obtain and maintain at its own cost, or cause its Contractors to obtain and maintain, the following types of insurance covering the Complex:

11.1.3 All Risks Marine Cargo insurance in an amount sufficient to cover the replacement cost of all plant and equipment shipped to and intended to become part of the Complex on a warehouse to warehouse basis and subject to deductibles of no more than [AMOUNT];

11.1.4 All Risks (Property Damage)/Operational insurance in an amount sufficient to cover the replacement cost of the Complex, including construction equipment and transit coverage for plant purchased within Host Country and not subject to the insurance described in Section 11.1.1 above and subject to deductibles of no more than [AMOUNT] for all other perils;

11.1.5 Employer Liability insurance complying with the Laws of Host Country or any other applicable jurisdiction and Employers' Liability Insurance with limits of at least

[AMOUNT] per occurrence and subject to deductibles of no more than [AMOUNT];

11.1.6 Comprehensive or Commercial General Liability insurance with bodily injury and property damage limits of at least [AMOUNT] per occurrence and [AMOUNT] in the aggregate and subject to deductibles of no more than [AMOUNT]. Such insurance shall include specific coverage for contractual liability encompassing the indemnification provisions in Article 12, broad form property damage liability, personal injury liability, explosion and collapse hazard coverage, liability for pollution (both gradual and sudden and accidental) products/completed operations liability, and, where applicable, watercraft protection and indemnity liability;

11.1.7 Comprehensive Automobile Liability insurance with bodily injury and property damage combined single limits of at least [AMOUNT] per occurrence covering vehicles owned, hired or non-owned and subject to deductibles of no more than [AMOUNT]; and

11.1.8 Excess Umbrella Liability Insurance with a single limit of at least [AMOUNT] per occurrence in excess of the limits of insurance provided in Sections 11.1.3, 11.1.4 and 11.1.5 above and subject to deductibles of no more than [AMOUNT].

11.2 Endorsements

The Company shall cause its insurers to amend its Comprehensive Commercial General Liability and, if applicable, Umbrella or Excess Liability policies with the endorsement items set forth in Sections 11.2.1 through 11.2.5 below; and to amend the Company's Employer Liability and Auto Liability policies with the endorsement item set forth in Section 11.2.5 below:

11.2.1 Client, its directors, officers, and employees are additional insureds under this policy;

11.2.2 This insurance is primary with respect to the interest of Client, its directors, officers, and employees and any other insurance maintained by them is excess and not contributory with this insurance;

11.2.3 The following Cross Liability section is made a part of the policy: “In the event of claims being made by reason of (a)

personal and/or bodily injuries suffered by any employee or employees of one insured hereunder for which another insured hereunder is or may be liable, or (b) damage to property belonging to any insured hereunder for which another insured is or may be liable, then this policy shall cover such insured against whom a claim is made or may be made in the same manner as if separate policies have been issued to each insured hereunder, except with respect to the limits of insurance. However, the inclusion of more than one injured will not operate to increase the limit of liability of the insureds hereunder beyond the limit of liability in this policy.";

11.2.4 Insurer hereby waives all rights of subrogation against Client, its officers, directors and employees; and

11.2.5 Notwithstanding any provision of the policy, this policy may not be canceled, renewed, or materially changed by the insurer without giving [_____] Days prior written notice to Client. All other terms and conditions of the policy shall remain unchanged.

11.3 Use of Proceeds of All Risk/Operational Insurance

The proceeds of any All Risks insurance obtained pursuant to Sections 11.1.1 and 11.1.2 shall, at the option of Client and subject to the Lenders' rights, be applied to the repair of the Complex.

11.4 Certificates of Insurance

The Company shall cause its insurers or agents to provide Client with certificates of insurance evidencing the policies and endorsements listed above. Failure by the Company to obtain the insurance coverage or certificates required by this Article 11 of insurance shall not in any way relieve or limit the Company's obligations or liabilities under any provision of this Agreement.

11.5 Premia and Deductibles

The Company shall be solely responsible for the payment of all premia and deductibles under the policies of insurance maintained pursuant to this Article 11.

## 12. INDEMNIFICATION AND LIABILITY

12.1 Indemnity by the Company

In addition to the Company's obligations and Client's remedies provided elsewhere in this Agreement, the Company will bear responsibility for loss of or

damage to property, death or injury to person, and any other liabilities, damages, losses and reasonable costs and expenses (including reasonable legal fees and expert witness fees) (or any claim against Client in respect thereof) suffered by Client:

12.1.1 during the design, financing, construction, ownership, operation or maintenance of the Complex resulting from any negligent act or omission of, or willful misconduct of, the Company;

12.1.2 in connection with, arising out of, or resulting from, any breach of warranty, misrepresentation by the Company, or non-performance of any term, condition, covenant or obligation to be performed by the Company under this Agreement or any other agreement comprising the Security Package; and

12.1.3 in connection with any claim, proceeding or action brought against Client under any applicable national or local environmental laws or regulations resulting from the Company's [lease/ownership] of the Site or the Company's ownership or operation of the Complex, including the discharge, dispersal, release, storage, treatment, generation, disposal or escape of pollutants or other toxic or hazardous substances from the Complex, the contamination of the soil, air, or water around the Site, or any pollution abatement, replacement, removal, or other decontamination or monitoring obligations with respect thereto.

The Company will hold Client fully indemnified in respect of the foregoing losses, damages, death, injuries, liabilities, costs and expenses; provided, however, that the Company’s indemnities shall not extend to any loss, damage, death, injury, liability, costs or expenses (or any claim in respect thereof) to the extent that they were caused by any act or omission of Client or the failure of Client to take reasonable steps in mitigation thereof.

12.2 Indemnity by Client

In addition to Client's obligations and the Company's remedies provided elsewhere in this Agreement, Client will bear responsibility for loss of or damage to property, death or injury to person, and any other liabilities, damages, losses and reasonable costs and expenses (including reasonable legal fees and expert witness fees) (or any claim against the Company in respect thereof) suffered by the Company:

12.2.1 during the design, financing, construction, ownership, operation or maintenance of the Complex resulting from any negligent act or omission of, or willful misconduct of, Client;

12.2.2 in connection with, arising out of, or resulting from, any misrepresentation by Client or non-performance of any term, condition, covenant or obligation to be performed by Client under this Agreement; and

12.2.3 in connection with any claim, proceeding or action brought against the Company under any applicable national or local environmental laws or regulations resulting from Client's ownership or operation of the Interconnection Facilities..

Client will hold the Company fully indemnified in respect of the foregoing losses, damages, death, injuries, liabilities, costs and expenses; provided, however, that Client's indemnities shall not extend to any loss, damage, death, injury, liability, cost or expense (or any claim in respect thereof) to the extent that it was caused by any act or omission of the Company or the failure of the Company to take reasonable steps in mitigation thereof.

12.3 Joint Negligence

In the event injury or damage results from the joint or concurrent negligent or intentional acts or omissions of the Parties, each Party shall be liable under this indemnification in proportion to its relative degree of fault.

12.4 No Indemnification for Fines and Penalties

Any fines or other penalties incurred by a Party for non-compliance with Laws of Host Country shall not be reimbursed by the other Party but shall be the sole responsibility of the non-complying Party. The non-complying party shall have the right, but not the obligation, to contest or appeal any fines it believes have been imposed in violation of the Laws of Host Country.

12.5 Notice of Proceedings

Each Party shall promptly notify the other Party of any claim or proceeding in respect of which, but for the provisions of Section 12.6, it is entitled to be indemnified under this Section. Such notice shall be given as soon as reasonably practicable after the relevant Party becomes aware of such claim or proceeding.

12.6 Basket Limitation

Neither Party shall be entitled to make any claim under this Article 12 until such time as all such claims by such Party exceed [AMOUNT] in the aggregate or

until such claim if not made would be barred by the relevant statute of limitations, at which time all such claims of that Party may be made; provided, however, that, when such claims have been made, the same rule shall apply in respect of future claims. Notwithstanding the foregoing, any claims outstanding at the termination or expiration of this Agreement may be brought at that time.

12.7 Conduct of Proceedings

Each Party shall have the right, but not the obligation, to contest, defend and litigate (and to retain legal advisers of its choice in connection therewith) any claim, action, suit or proceeding by any third party alleged or asserted against it arising out of any matter in respect of which it is entitled to be indemnified hereunder, and the reasonable costs and expenses thereof shall be subject to the said indemnity; provided, however, that, the indemnifying Party shall be entitled, at its option, to assume and control the defense of such claim, action, suit or proceeding at its expense and through legal advisers of its choice if it (a) gives notice of its intention to do so to the other Party, (b) acknowledges in writing its obligation to indemnify that Party to the full extent provided by this Article 12, and (c) reimburses that Party for the reasonable costs and expenses previously incurred by it prior to the assumption of such defense by the indemnifying Party. Neither Party shall settle or compromise any claim, action, suit or proceeding in respect of which it is entitled to be indemnified by the other Party without the prior written consent of that Party[, which consent shall not be unreasonably withheld or delayed]; provided, however, that after agreeing in writing to indemnify the indemnified Party, the indemnifying Party may settle or compromise any such claim, action, suit or proceeding without the approval of the indemnified Party.

## 13. FORCE MAJEURE

13.1 Meaning of Force Majeure

In this Agreement, "Force Majeure" means any event or circumstance or combination of events or circumstances beyond the reasonable control of a Party which materially and adversely affects the performance by that Party of its obligations or the enjoyment by that

Party of its rights under or pursuant to this Agreement. Without limitation to the generality of the foregoing, "Force Majeure" shall include the following events and circumstances to the extent that they satisfy the above requirements:

13.1.1 natural events ("Force Majeure - Natural") including:

(a) acts of God; (including lightning, fire, earthquake, flood, storm, hurricane,

cyclone, typhoon, tidal wave and tornado);

(b) epidemic or plague;

(c) explosion or chemical contamination (other than resulting from an event or circumstance described in Section 13.1.2(a)(i), in which case it shall be a Host Country Political Event); and

(d) any event or circumstance constituting Force Majeure - Natural under the Implementation Agreement; and

13.1.2 other events of Force Majeure ("Force Majeure - Political") including:

(a) Force Majeure - Political which occurs inside or directly involves Host Country ("Host Country Political Events") including:

(i) any act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, civil commotion, act of terrorism, or sabotage;

(ii) nationwide strikes, works to rule or go-slows that extend beyond the Complex or are widespread or nationwide, or that are of a political nature, such as, by way of example and not limitation, labor actions associated with or directed against a Host Country political party, or those that are directed against the Company (or its Contractors) as a part of a broader pattern of labor actions against companies or facilities with foreign ownership or management;

(iii) any Change in Law;

(iv) radioactive contamination or ionizing radiation originating from a source in Host Country or resulting from another Host Country Political Event;

(v) any Lapse of Consent; and

(vi) any event or circumstance constituting a Host Country Political Event under the Implementation Agreement;[70] and

(b) Force Majeure - Political which occurs outside Host Country and does not directly involve Host Country ("Foreign Political Events") including:

(i) any act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, civil commotion, act of terrorism, or sabotage;

(ii) strikes, works to rule or go-slows that are widespread or nationwide;

(iii) radioactive contamination or ionizing radiation originating from a source outside Host Country and not falling within Section 13.1.2(a)(iv); and

(iv) any event or circumstance constituting a Foreign Political Event under the Implementation Agreement.

13.2 Notification and Obligation to Remedy.

In the event of the occurrence of a Force Majeure that prevents a Party from performing its obligations hereunder (other than an obligation to pay money),

such Party shall: (a) notify as soon as reasonably practicable the other Party in writing of such Force Majeure; (b) not be entitled to suspend performance under this Agreement for any greater scope or longer duration than is required by the Force Majeure; (c) use all reasonable efforts to remedy its inability to perform and to resume full performance hereunder as soon as practicable; (d) keep such other Party apprised of such efforts on a continuous basis; and (e) provide written notice of the resumption of performance hereunder. Notwithstanding the occurrence of a Force Majeure, the Parties shall perform their obligations under this Agreement to the extent the performance of such obligations is not impeded by the Force Majeure.

13.3 Consequences of Force Majeure

13.3.1 Neither Party shall be responsible or liable for, or deemed in breach hereof because of, any failure or delay in complying with its obligations under or pursuant to this Agreement which it cannot perform due solely to one or more Force Majeure or its or their effects or by any combination thereof, and the periods allowed for the performance by the Parties of such obligation(s) shall be extended on a day-for-day basis for so long as one or more Force Majeure continues to affect materially and adversely the performance of such Party of such obligation(s) under or pursuant to this Agreement; provided, however, that no relief shall be granted to the Party claiming Force Majeure pursuant to this Section 13.3 to the extent that such failure or delay would have nevertheless been experienced by that Party had such Force Majeure not occurred; and provided further, that the Party not claiming Force Majeure may immediately terminate this Agreement without further obligation if Force Majeure delays a Party's performance for a period greater than (a) [_____] consecutive months prior to the Commercial Operations Date or (b) [_____] consecutive months after the Commercial Operations Date.

13.3.2 During the pendency of Force Majeure - Natural or a Foreign Political Event, the Company shall not be entitled to receive Capacity Payments or Water Payments [or Supplemental Payments] from Client; provided, however, that if such Force Majeure - affects only part of the Complex, then the Capacity Payments [and Supplemental Payments] during the pendency of such Force Majeure shall be pro-rated to reflect the portion of the Complex not affected thereby, and the Company shall be entitled to receive such pro-rated Capacity Payments [and Supplemental Payments] and Water Payments for irrigation water actually delivered to Client.

13.3.3 During the pendency of a Host Country Political Event, the Company shall be entitled to receive Capacity Payments from Client at the same level as the Capacity Payments paid immediately prior to the Host Country Political Event for a maximum period of [_____] months commencing with the date of the occurrence of the Host Country Political Event; provided, however, that if the Host Country Political Event affects only part of the Complex, then the Capacity Payments during the pendency of such Host Country Political Event shall be the sum of (a) the payments previously described in this sentence pro-rated to reflect the portion of the Complex affected by the Host Country Political Event plus (b) Capacity Payments calculated in accordance with Article 9 pro-rated to reflect the portion of the Complex not affected by the Host Country Political Event.

## 14. TAXES

All present and future national, local or other lawful taxes, duties, levies, or other impositions applicable to the Company, the Complex, the Project and the Company's other assets shall be paid by the Company in a timely fashion. Nothing herein, however, shall in any way limit or override any provisions of Schedule 6 which allow or provide for certain taxes and charges to be treated as pass-through items. All present and future national, local or other lawful taxes, duties, levies, or other impositions applicable to Client arising from or in connection with its rights and obligations under this Agreement shall be paid by Client in a timely fashion.

## 15. DEFAULTS AND TERMINATION

### 15.1 Company Events of Default

Each of the following events shall be events of default by the Company (each a "Company Event of Default"), which, if not cured within the time permitted (if any) under Section 15.3, shall give rise to the right on the part of Client to terminate this Agreement pursuant to Section 15.4; provided, however, that no such event shall be a Company Event of Default hereunder if (a) it results from a breach by Client of this Agreement or (b) if it occurs as a result of a Force Majeure for the period provided pursuant to Section 13.3:

15.1.1 the failure of the Company to post the Construction Security in accordance with Section 9.4.1 on or before Financial Closing;

15.1.2 the failure of the Company to achieve the Commencement of Construction within [_____] Days after Financial Closing;

15.1.3 the Abandonment by the Company of the construction of the Complex after the Commencement of Construction without the written consent of Client;

15.1.4 the failure of the Company to achieve the Commercial Operations Date within [_____] after the Required Commercial Operations Date;

15.1.5 the failure of the Company to provide or replenish the Operations Security in accordance with Section 9.4.2 of this Agreement;

15.1.6 the Abandonment by the Company of the operation of the Complex without the written consent of Client;74

15.1.7 the appointment or replacement by the Company of a Construction Contractor or an O&M Contractor or any [material] amendment to or waiver of any terms of the Construction Contract or the O&M Contract without the prior consent of Client;

15.1.8 the assignment or transfer of this Agreement or an assignment, transfer or acquisition in breach of Section 17.1 or 17.2 of this Agreement;

15.1.9 any failure by the Company to make any payment or payments required to be made by it under this Agreement within

15.1.10 [_____] Days after the Company is given notice that the payment was not made by the due date for payment; except for the purpose of amalgamation, reorganization or reconstruction (provided that such amalgamation, reorganization or reconstruction does not affect the ability of the amalgamated, reorganized or reconstructed entity, as the case may be, to perform its obligations under this Agreement), the occurrence of any of the following events: (a) the passing of a resolution by the owners of the Company for the winding up of the

Company; (b) the admission in writing by the Company of its inability generally to pay its debts as they become due; (c) the appointment of a provisional manager, trustee, liquidator or similar person in a winding up proceeding after notice to the Company and due hearing; or (d) the making by a court with competent jurisdiction over the Company of an order winding up the Company;

15.1.11 reduction of the Dependable Capacity to less than [__] $m^3/s$ for a period of at least twelve (12) consecutive Months; or

15.1.12 any [material] breach by the Company of this Agreement, which breach has a [material and] adverse impact on Client.

15.2 Client Events of Default

Each of the following events shall be events of default by Client (each a "Client Event of Default"), which, if not cured within the time permitted (if any) under Section 15.3, shall give rise to the right on the part of the Company to terminate this Agreement pursuant to Section 15.4; provided, however, that no such event shall be a Client Event of Default hereunder if (a) it results from a breach by the Company of this Agreement or (b) if it occurs as a result of a Force Majeure for the period provided pursuant to Section 13.3:

15.2.1 the expropriation, compulsory acquisition or nationalization by Government or any Public Sector Entity of (a) any shares in the Company, or (b) all or any substantial assets or rights of the Company;

15.2.2 except for the purpose of amalgamation, reorganization or reconstruction (provided that such amalgamation, reorganization or reconstruction does not affect the ability of the amalgamated, reorganized or reconstructed entity, as the case may be, to perform its obligations under this Agreement), the occurrence of any of the following events: (a) the passing of a resolution by the shareholders of Client for the winding up of Client; (b) the admission in writing by Client of its inability generally to pay its debts as they become due; (c) the appointment of a provisional manager, trustee, liquidator or similar person in a winding up proceeding after notice to Client and due hearing; or (d) the making by any court with competent jurisdiction over Client of an order winding up Client;

15.2.3 any failure by Client to make any payment or payments required to be made by it under this Agreement within

[_____] Days after Client is given notice that the payment was not made by the due date for payment;

15.2.4 the assignment or transfer of this Agreement or an assignment, transfer or acquisition in breach of Section 17.1 of this Agreement; or

15.2.5 any [material] breach by Client of this Agreement, which breach has a [material and] adverse impact on the Company.

15.3 Notice and Cure

15.3.1 In the case of a Client Event of Default or a Company Event of Default (each, an "Event of Default"), as the case may be, set forth in Section 15.1 or Section 15.2, the defaulting Party shall have [_____] Days to cure the Event of Default. If such Event of Default is incapable of being cured within that period, the defaulting Party may request from the non-defaulting Party an additional period of [_____] Days to cure the Event of Default, and approval by the non-defaulting Party of such request shall not be unreasonably withheld or delayed. The defaulting Party shall furnish to the non-defaulting Party during any cure period weekly reports on its progress in curing the Event of Default.

15.3.2 Upon occurrence of an Event of Default that is not cured within the applicable period (if any) for cure, the non-defaulting Party may, at its option, initiate termination of this Agreement by delivering a written notice ("Notice of Default") of its intent to terminate this Agreement to the defaulting Party. A Notice of Default shall specify in reasonable detail the Event of Default giving rise to the Notice of Default.

15.4 Rights and Remedies Upon an Event of Default

15.4.1 If a Company Event of Default has occurred and the Company Event of Default has not been cured within the period specified in Section 15.3, Client, in its sole discretion, may:

(a) terminate this Agreement by delivering written notice to the Company; and/or

(b) proceed in accordance with Article 16 to protect and enforce its rights, to recover any damages to which it may be entitled (including

all costs and expenses reasonably incurred in the exercise of its remedy); and/or

(c) retain all or part of the Construction Security and/or the Operations Security provided by the Company pursuant to Section 9.4 in full or partial satisfaction of the damages to which it may be entitled under subsection (b) above; and/or

(d) purchase the Complex pursuant to Section 15.5.

These rights and remedies shall not be exclusive but, to the extent permitted by law, shall be cumulative and in addition to all other rights and remedies existing at law, in equity or otherwise; provided, however, that Client may seek to exercise such rights and remedies only in accordance with the procedures set forth in Article 16. Client may exercise each right and remedy afforded by this Agreement or by law from time to time and as often as may be deemed expedient by Client. No delay by, or omission of, Client to exercise any right or remedy arising upon any Company Event of Default shall impair any such right or remedy or constitute a waiver of such event or an acquiescence thereto.

15.4.2 If a Client Event of Default has occurred and the Client Event of Default has not been cured within the period specified in Section 15.3, the Company, in its sole discretion, may:

(a) terminate this Agreement by delivering written notice to Client; and/or

(b) proceed in accordance with Article 16 to protect and enforce its rights and to recover any damages to which it may be entitled (including all costs and expenses reasonably incurred in the exercise of its remedy); and/or

(c) retain all or part of any Letter of Credit issued pursuant to Section 9.7 or make a demand under the Guarantee, in either case, in full or partial satisfaction of the damages to which it may be entitled under subsection (b) above.

These rights and remedies shall not be exclusive but, to the extent permitted by law, shall be cumulative and in addition to all other rights and remedies existing at law, in equity or otherwise; provided, however, that the Company may seek to exercise such rights and remedies only in accordance with the procedures set forth in Article 16. The Company may exercise each right and remedy afforded by this Agreement or by law from time to time and as often as may be deemed expedient by the Company. No delay by, or omission of, the Company to exercise any right or remedy arising upon any Client Event of Default shall impair any such right or remedy or constitute a waiver of such event or an acquiescence thereto.

15.5 Option to Purchase

15.5.1 If this Agreement terminates because of a Company Event of Default pursuant to Section 15.4.2, then Client shall have an option to purchase the Complex (including materials, records, drawings and spare parts) at a purchase price equal to the value of the Complex which shall be the greater of (a) the fully depreciated value of the Complex or (b) the remaining debt service under the Loan Documents minus, in either case (a) or (b), any liquidated damages or other Damages and accrued interest thereon to which
Client is entitled (the "Termination Purchase Price"). Said option may be exercised by Client at any time within [_____] Days after the termination of this Agreement by written notice to the Company. If the Company and Client do not agree on the Termination Purchase Price within [_____] Days following Client's exercise of the above option, then either Party may submit the determination of the Termination Purchase Price for expert determination in accordance with Section 16.2. As soon as practicable following the receipt of said notice by the Company, but in no event later than [_____] Days after the Termination Purchase Price has been fixed, the Company shall transfer and assign to Client all of its right, title and interest in the Complex, free and clear of all liens, charges and encumbrances except the liens, charges and encumbrances created under the Loan Documents, and Client shall simultaneously pay to the Company the Termination Purchase Price and assume the outstanding debt under the Loan Documents.

15.5.2 Upon the written request of Client, the Company shall sign, execute and deliver, or cause to be signed, executed and delivered, and do or make, or cause to be done or made, any

and all agreements, instruments, papers, deeds, acts or things, supplemental, confirmatory or otherwise, as may be required by Client for the purpose of or in connection with the option set forth in Section 15.5.1, including transferring to Client, for the major items of plant incorporated into the Complex, copies of all manufacturers' specifications, manufacturers' operation and maintenance manuals, and signed and sealed copies of all as-built drawings for the Complex, including the civil and architectural works.

15.6 Obligations Upon Termination

Upon expiration or termination of this Agreement, the Parties shall have no further obligations or liabilities hereunder except for those obligations and liabilities that (a) arose prior to such termination, or (b) expressly survive such termination pursuant to Section 19.13.

## 16. RESOLUTION OF DISPUTES

16.1 Mutual Discussions

If any dispute or difference of any kind whatsoever (the "Dispute") shall arise between the Client and the Company in connection with, or arising out of, this Agreement, the Parties shall attempt in good faith to settle such Dispute in the first instance within [_____] Days by mutual discussions between the Company and Client, which may include referring the Dispute to the Operating Committee for resolution within such [_____] Day period.

16.2 Referral to an Expert

16.2.1 If the Dispute cannot be settled within the period allowed in Section 16.1 and

(a) referral to an expert is required by this Agreement; or

(b) the Parties otherwise agree in writing,

in each case, the Dispute shall be referred to an expert for determination.

16.2.2 The Party specified in the relevant provision as having the right (or either Party if no single Party is so specified) may give notice
("Notice of Intention to Refer") to the other Party of its intention to so refer the Dispute. The Party giving that notice is referred to herein as the "Applicant", and the Party to whom such notice is given is referred to herein as the "Respondent".

16.2.3 A Notice of Intention to Refer shall include, inter alia:

(a) a description of the Dispute;

(b) the grounds on which the Applicant relies in seeking to have the Dispute determined in its favor; and

(c) all written material which the Applicant proposes to submit to the expert;

provided however, that this Section 16.2.3 shall not be construed so as to prevent the Applicant from using or producing further written material

which comes into existence or comes to the Applicant's attention after the Notice of Intention to Refer is given, but in such event the Respondent shall be allowed a reasonable time to respond thereto.

16.2.4 The Respondent shall within [_____] Days after service of the Notice of Intention to Refer, give to the Applicant a notice
("Notice of Intention to Defend") of intention to defend which shall include, inter alia:

(a) the grounds upon which the Respondent relies in seeking to have the question determined in its favor; and

(b) all written material that the Respondent proposes to submit to the expert;

provided, however, that this Section 16.2.4 shall not be construed so as to prevent the Respondent from using or producing further written material which comes into existence or comes to the Respondent's attention after the Notice of Intention to Defend is given but in such event the Applicant shall be allowed a reasonable time to respond thereto.

16.2.5 If within [_____] Days after service of a Notice of Intention to Defend, the Parties have agreed on an expert and on the terms under which the Dispute shall be referred, the Dispute shall be so referred. In the event that the Parties are unable within [_____] Days after service of a Notice of Intention to Defend to agree upon an expert to be appointed hereunder or upon the terms of such expert's reference or both, then either Party may request (a) for all Disputes involving invoices or amounts owed by one Party to the other, the [INSTITUTE OF CHARTERED ACCOUNTANTS OF HOST COUNTRY] and (b) for all Disputes other than Disputes involving invoices or amounts owed by one Party to the other, the then presiding president of the [ASSOCIATION OF ENGINEERS OF HOST COUNTRY], in either case, to appoint an expert, and the terms of reference of such expert's appointment shall be those set out in the Notice of Intention to Refer and the Notice of Intention to Defend; provided, however, that no expert appointed pursuant to this Section 16.2 shall be a national of the jurisdiction of either Party to this Agreement[85] or of the jurisdiction of any of the Initial Shareholders (nor shall such expert be a former employee or agent of any such person).

16.2.6 Within [_____] Days of the appointment of the expert, the expert shall nominate a time and place in the Host Country for a hearing of the Parties on the Dispute, which time shall not be more than [_____] Days after the expert's appointment.

16.2.7 The Parties shall not be entitled to apply for discovery of documents but shall be entitled to have access to the other Party's records and data in accordance with Section 6.10.

16.2.8 At the time nominated for the hearing, each Party must appear before the expert and present its case.

16.2.9 The expert must render his decision on the Dispute as soon as possible after completion of the hearing and must forthwith advise the Parties in writing of his determination and his reasons therefor.

16.2.10 The proceedings shall be without prejudice and any evidence given or statements made in the course of the hearing may not be used against a Party in any other proceedings.

16.2.11 The proceedings shall not be regarded as an arbitration and the laws relating to commercial arbitrations shall not apply;

provided, however, that the expert shall resolve the Dispute in accordance with the Laws of Host Country.

16.2.12 Once a Dispute is referred to an expert, the expert may shorten any of the time periods required by this Section 16.2 if, in the expert's best judgment, the Dispute requires expeditious resolution.

16.2.13 The decision of the expert shall be final and binding upon both Parties upon the delivery to them of the expert's written determination, save in the event of fraud, serious mistake or miscarriage.

16.2.14 If the expert does not render a decision within a period of [_____] Days of his appointment or such longer or shorter period as the Parties may agree in writing, either Party may, upon giving notice to the other, terminate such appointment, and a new expert shall be appointed who shall resolve the Dispute in accordance with the provisions of this Section 16.2. If the Dispute is not resolved by one or more experts within [_____] months after the receipt by the Respondent of the Notice of Intention to Refer, then either Party may refer the Dispute for arbitration in accordance with this Agreement.

16.2.15 The costs of engaging an expert shall be borne equally by the Parties and each Party shall bear its own costs in preparing materials for, and making presentations to, the expert.

16.3 Arbitration

16.3.1 Any Dispute arising out of or in connection with this Agreement that has not been resolved following the procedures set forth in Sections 16.1 and 16.2 shall (regardless of the nature of the Dispute but without prejudice to the provisions of this Agreement requiring any matter to be referred to an expert for final determination) be referred to arbitration and finally settled in accordance with the Convention on the Settlement of Investment Disputes between States and Nationals of other States (the "Convention") and the Rules of Procedure for Arbitration Proceedings of the International Centre for Settlement of Investment Disputes (the "Centre") established by the Convention (the "ICSID Rules") and the Parties hereby consent to arbitration thereunder.86 The Parties agree and acknowledge that the Company shall be deemed a foreign

controlled company for the purposes of consenting to the jurisdiction of the Convention so long as not less than thirty-five percent (35%) of the shares of the Company are held by Foreign Investors. Arbitration proceedings conducted pursuant to this Section 16.3.1 shall be held at [LOCATION] in Host Country.

16.3.2 As from the date on which the shareholding of the Foreign Investors falls below [_____]% of the [shares of the Company], then the dispute shall be finally settled by arbitration under the [ARBITRATION ACT OF HOST COUNTRY]. Arbitration proceedings conducted pursuant to this Section 16.3.2 shall be held at [LOCATION] in Host Country.

16.3.3 No arbitrator appointed pursuant to Section 16.3 shall be a national of the jurisdiction of either Party to this Agreement or of the jurisdiction of any of the Initial Shareholders (nor shall any such arbitrator be an employee or agent or former employee or agent of any such person).

16.3.4 The language of any arbitration under Section 16.3.1 or Section 16.3.2 shall be [_____].

16.3.5 Each Party hereby agrees to be bound by any final decision or award of any arbitrator(s) duly appointed under this Agreement.

16.3.6 Except as awarded by the arbitrator(s), each Party shall be responsible for its own costs incurred by it in connection with an arbitration hereunder.

16.4 Waiver of Sovereign Immunity

Client unconditionally and irrevocably:

16.4.1 agrees that the execution, delivery and performance by it of this Agreement and those agreements included in the Security Package to which it is a Party constitute private and commercial acts rather than public or governmental acts;

16.4.2 agrees that, should any proceedings be brought against it or its assets other than assets protected by the diplomatic and consular privileges under the [RELEVANT SOVEREIGN IMMUNITY ACTS] (“Excepted Assets”) in any jurisdiction in relation to this

16.4.3 Agreement or any transaction contemplated by this Agreement, no immunity from such proceedings shall be claimed by or on behalf of itself or with respect to its assets (other than Excepted Assets);

16.4.4 consents generally in respect of the enforcement of any judgment against it in any such proceedings in any jurisdiction to the giving of any relief or the issue of any process in connection with such proceedings (including the making, enforcement or execution against or in respect of any property whatsoever irrespective of its use or intended use).

16.5 Service of Process

With respect to any proceedings for enforcement of an award pursuant to this Article 16 against assets of either Party brought in the courts of [_____] :

16.5.1 the Company appoints [_____], whose address is presently [_____], to receive for and on its behalf service of process in such jurisdiction in any such enforcement proceedings;

16.5.2 the Company agrees to maintain in [_____] duly appointed process agents, notified to Client for the purposes of Section 16.5.1 above;

16.5.3 Client appoints [_____], whose address is presently [_____], to receive for and on its behalf service of process in such jurisdiction in any such enforcement proceedings;

16.5.4 Client agrees to maintain in [_____] duly appointed process agents, notified to the Company for the purposes of Section 16.5.3 above; and

16.5.5 each Party agrees that failure by any such process agent to give notice of any process to it shall not impair the validity of such service or of any judgment based thereon.

16.6 Continued Performance

During the pendency of any Dispute being handled in accordance with this Article 16, (a) the Company shall continue to perform its obligations under this Agreement to deliver Dependable Capacity and Net Water Delivery, (b) Client shall continue to pay all amounts due in accordance with Article 9 that are not

in dispute, and (c) neither Party shall exercise any other remedies hereunder arising by virtue of the matters in dispute.

## 17. ASSIGNMENT

17.1 Right to Assignment

17.1.1 The Company may not assign or transfer its rights or obligations under, pursuant to or associated with (a) this Agreement, (b) the Complex,88 (c) the Site, (d) the movable property and intellectual property of the Company, or (e) the revenues or any of the rights or assets of the Company, in each of subsections (a) through (e) without the prior written consent of [Client/Government]. Notwithstanding the foregoing sentence, the Company may assign or transfer (i) assets that, during any Financial Year, do not have an aggregate net book value of an amount equivalent to [AMOUNT]; provided, however, that such assets are sold, transferred or otherwise disposed of on an arm's length basis at full market price and that such sale, transfer or disposal shall not impair the operation of the Project and (ii) obsolete or worn out assets no longer used or useful in its business or assets that are promptly
replaced by assets of a similar nature and approximately equal value.

17.1.2 Client shall not assign its rights or obligations under this Agreement without the prior written consent of the Company [, which consent shall not be unreasonably withheld or delayed]; provided, however, that any such assignee of Client shall have the ability to perform all of Client's obligations and duties under this Agreement.

17.2 Creation of Security

17.2.1 Notwithstanding the provisions of Section 17.1.1, for the purpose of financing the construction, operation and maintenance of the Complex, the Company may assign or create security over its rights and interests under, pursuant to or associated with the assets identified in Section 17.1.1(a) through (f); provided, however, that the Company shall not create any such security without the prior written consent of [Client/Government][, which consent shall not be unreasonably withheld or delayed]. Client shall execute all such acknowledgments of any security created in accordance with the foregoing

sentence as are reasonably requested by the Company to give effect to the foregoing sentence.

17.2.2 Client shall use all reasonable efforts to execute, acknowledge and deliver any and all further documents and instruments, and to take any other actions, which may be necessary to satisfy the reasonable requests of any Lenders or prospective Lenders in connection with the financing or refinancing of the Project, including executing and delivering to the Lenders a consent to assignment (or other form of direct agreement) concerning the Project between Client and the Lenders in form and substance satisfactory to the Lenders. The foregoing sentence shall not be construed to require Client to execute, acknowledge and deliver any further documents and instruments, or to take any other actions, which are inconsistent with its rights under this Agreement or which are expressly subject to its consent or approval under this Agreement.

## 18. NOTICES

18.1 Address for Notices

Any notice, communication, request or correspondence (each a "notice") required or permitted under the terms and conditions of this Agreement shall be in writing, in the English language (it being understood that any such communication or paper in a language other than English shall be of no force or effect), and shall be (a) delivered personally, (b) transmitted by telefacsimile and either (i) recipient acknowledges receipt to sender or (ii) sender delivers to recipient a transmission confirmation; or (c) sent by an internationally-recognized overnight mail or courier service, with delivery receipt requested, to the following addresses:

If to Client:

Address: _____

_____

_____

Telefax No.: _____

Attention:

If to the Company:

Address:

Telefax No.:
Attention:

or such other address and/or telefacsimile number as either Party may previously have notified to the other Party in accordance with this Section 18.1.

18.2 Effectiveness of Service

Notices shall be effective: (a) in the case of personal delivery, when received by the recipient; (b) in the case of transmission by telefacsimile, if receipt of the transmission occurs before [TIME] recipient's time and recipient receives a transmission confirmation or otherwise acknowledges transmission, upon receipt of transmission, or if receipt of the facsimile transmission occurs after [TIME] recipient's time and recipient receives a transmission confirmation or otherwise acknowledges transmission, the next succeeding Business Day, or (c) in the case of an internationally-recognized and reputable priority courier, [four (4)] days after dispatch.

## 19. MISCELLANEOUS PROVISIONS

19.1 Variations in Writing

All additions, amendments or variations to this Agreement shall be binding only if in writing and signed by duly authorized representatives of both Parties.

19.2 Entire Agreement

This Agreement and all Schedules thereto together represent the entire understanding between the Parties in relation to the subject matter thereof and supersede any or all previous agreements or arrangements between the Parties in respect of the Complex (whether oral or written).

19.3 Severability

In the event that any one or more of the provisions of this Agreement shall be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein or of the same provisions in any other jurisdiction shall not in any way be affected or impaired thereby.

19.3 Waivers

19.4.1 No waiver by either Party of any default by the other in the performance of any of the provisions of this Agreement shall

(a) operate or be construed as a waiver of any other or further default whether of a like or different character (b) be effective unless in writing duly executed by an authorized representative of such Party.

19.4.2 The failure by either Party to insist on any occasion upon the performance of the terms, conditions or provisions of this Agreement or time or other indulgence granted by one Party to the other shall not thereby act as a waiver of such breach or acceptance of any variation.

19.4 Confidentiality

19.5.1 Each of the Parties shall hold in confidence all documents and other information, whether technical or commercial, relating to the Project or the design, financing, construction, ownership, operation or maintenance of the Complex that is of a confidential nature and that is supplied to it by or on behalf of the other Party. The Party receiving such documents or information shall not publish or otherwise disclose them or use them for its own purposes (otherwise than as may be required by it, its professional advisers, or potential or actual lenders or investors to perform its obligations under this Agreement).

19.5.2 The provisions of Section 19.5.1 above shall not apply to any information: (a) which is or becomes available to the public other than by breach of this Agreement; (b) which is in or comes into the possession of the receiving Party prior to the aforesaid publication or disclosure and which was not or is not obtained under any obligation of confidentiality; (c) which was or is obtained from a third party who is free to divulge the same and which was or is not obtained under any obligation of confidentiality; or (d) which is required by law or appropriate regulatory authorities to be disclosed; provided, however, that the Party supplying the information is notified of the requirement set forth in subclause (d) at least [_____] Business Days prior to such disclosure and the disclosure is limited to the maximum extent possible.

19.5.3 For the avoidance of doubt, nothing herein contained shall preclude the use of provisions similar to those contained in this Agreement and the other agreements referred to herein in any agreements prepared and issued in connection with other projects.

19.6 Successors and Assigns

This Agreement shall inure to the benefit of, and be binding upon, the Parties hereto and their respective successors and permitted assigns.

19.7 No Liability for Review

No review or approval by Client of any agreement, document, instrument, drawing, specifications or design proposed by the Company shall relieve the Company from any liability that it would otherwise have had for its negligence in the preparation of such agreement, document, instrument, drawing, specifications or design or from failure to comply with the applicable Laws of Host Country with respect thereto, nor shall Client be liable to the Company or any other person by reason of its review or approval of an agreement, document, instrument, drawing, specification, or design. Furthermore, Client shall not be liable to the Company or any other person by reason of its observation or inspection of, or any suggestions relating to, the construction, testing, operation or maintenance of the Complex.

19.8 Consequential Damages

Neither Party shall be liable to the other Party in contract, tort, warranty, strict liability or any other legal theory for indirect, consequential, punitive or exemplary damages resulting from the performance of obligations or the exercise of rights under or pursuant to this Agreement.

19.9 No Third Party Beneficiaries

This Agreement is intended solely for the benefit of the Parties hereto and, except for rights expressly granted to the Lenders or other persons, nothing in this Agreement shall be construed to create any duty to, standard of care with reference to, any liability to, or any right of suit or action in, any person not a Party to this Agreement.

19.10 Affirmation

The Company and Client declare and affirm that neither Party has paid nor has it undertaken to pay and that it shall in the future not pay any bribe, pay-offs, kick-backs or unlawful commission and that it has not in any other way or manner paid any sums, whether in Local Currency or Foreign Currency and whether in Host Country or abroad, or in any other manner given or offered to give any gifts and presents in Host Country or abroad to any person or company to procure this Agreement, and the Company and Client undertake not to engage in any of the said or similar acts during the term of and relative to this Agreement.

19.11 Governing Law

This Agreement and the rights and obligations of the Parties under or pursuant to this Agreement shall be governed by and construed according to the laws of Host Country.

19.12 Relationship of the Parties

This Agreement shall not make either of the Parties partners or joint venturers one with the other, nor make either the agent of the other. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or the otherwise bind, the other Party.

19.13 Survival

Cancellation, expiration or earlier termination of this Agreement shall not relieve the Parties of obligations that by their nature should survive such cancellation, expiration or termination, including the rights and obligations, warranties, remedies, promises of indemnity and confidentiality set forth in Sections 9.3.6, 9.4, and 19.5 and Articles 12, 15 and 16.

19.14 Language

The language for the purpose of administering this Agreement, including any expert proceeding or arbitration hereunder, shall be [_____].

19.15 Good Faith

In carrying out is obligations and duties under this Agreement, each Party shall have an implied obligation of good faith.

I N W I T N E S S whereof the Parties have entered into this Agreement the date first above written.

[NAME OF WATER PURCHASER]
By: _____
Name: _____
Title: _____

WITNESSED BY:
By: _____
Name:_____

[NAME OF WATER SUPPLIER]
By: _____

Name: _____
Title: _____

WITNESSED BY:
By: _____
Name: _____

SCHEDULE 1

DEFINITIONS

Whenever the following terms appear in this Agreement or the Schedules hereto, whether in the singular or in the plural, present, future or past tense, they shall have the meanings stated below unless the contest otherwise requires:

**"Abandonment"** - Either (a) the cessation of substantially all activities relating to the construction or operation and maintenance of the Complex, as appropriate (except a cessation that is the direct result of a local strike which occurred and continued despite the reasonable actions or inactions of the Company or its Contractors), or (b) the physical absence of substantially all employees of the Company and its Contractors from the Site after the commencement of excavation for the foundations of the Complex, in either case (a) or (b) for at least [_____] consecutive hours.

**"Agreement"** - This Water Purchase Agreement, including all Schedules thereto, as amended or supplemented from time to time.

**"AIDC"** - The Dependable Capacity of the Complex as established at the Commercial Operations Date in accordance with Article 10 and Schedule 4.

**"Applicant"** - The Party that served a Notice of Intention to Refer pursuant to Section 16.2.2.

**"Base Rate"** - [DESCRIBE BASE INTEREST RATE]. Whenever the Base Rate is applied, the interest shall be compounded [_____], computed for the actual number of Days elapsed on the basis of a 365-Day year.

**"Backup Metering System"** - The meaning ascribed thereto in Section 8.1.2.

**"Business Day"** - A day on which business by and between banks may be carried on in [LOCATION] in Host Country.

**"Capacity Payment"** - The meaning ascribed thereto in Section 9.1.1.

**"Capacity Purchase Price"** - The price which Client will pay to the Company per $m^3/s$ for Dependable Capacity as determined in accordance with Schedule 6 hereto.

**"Centre"** - The meaning ascribed thereto in Section 16.3.1.

**"Change in Law"** - The (a) the adoption, promulgation, modification or re-interpretation after [DATE] by any Public Sector Entity of any Law of Host Country (including a decision of a Public Sector Entity after [DATE], which amends or conflicts with the Laws of Host Country established or in effect as of [DATE] or (b) the imposition after [DATE] by a Public Sector Entity of any term or condition in connection with the issuance, renewal, extension, replacement or modification of any Consent, that in either case establishes requirements for the construction, operation or maintenance of the Complex that are more restrictive or more onerous than the most restrictive or most onerous requirements in effect as of [DATE].

**"Change Order"** - Any change order to be given to the Construction Contractor under the Construction Contract which relates to a component of the physical work-in-progress at the Site and which is an WPA Amended Document.

**"Commencement of Construction"** - The initiation of the construction of the Complex as evidenced by the Company's (a) issuance of the Notice to Proceed under the Construction Contract and (b) making of the Initiation Payment.

**"Commercial Operations Date"** - The date on which the entire Complex is Commissioned in accordance with Section [____] of Schedule 4.

**"Commissioned"** - The state or act of successful completion of Commissioning of the Complex.

**"Commissioned Shortfall"** - The difference between (a) the Dependable Capacity of the Complex on the Commercial Operations Date if less than [___] $m^3/s$ and (b) [___] $m^3$.

**"Commissioning"** - Engaging in the operations required for testing of the Complex in accordance with Section [__] of Schedule 4.

**"Company Event of Default"** - An event described in Section 15.1 for which Client may issue a Notice of Default to the Company.

**"Complex"** - The canal or the pipes connected to the feeder canal of SVIP to deliver water to the irrigation system of the Client.

**"Complex Hour"** - Each hour of partial or complete interruption of the operation of the Complex.

**"Consents"** - All such approvals, consents, authorizations, grants or certificates of registration, notifications, concessions, acknowledgments, agreements, licenses, permits, decisions or similar items required to be obtained from any Public Sector Entity or other relevant governmental entity for the Company or for the construction, financing, ownership, operation and maintenance of the Complex.

**"Construction Contract"** - The agreement to be entered into by the Company for the design, manufacture, construction and Commissioning of the Complex.

**"Construction Contractor"** - The party or parties to the Construction Contract other than the Company.

**"Construction Security"** - The meaning ascribed thereto in Section 9.4.1.

**"Contract Price"** - The price for the design, manufacture, construction and Commissioning of the Complex specified under the Construction Contract.

**"Contractor"** - Any contractor employed by the Company in the design, manufacture, construction, operation or maintenance of the Complex or any part thereof.

**"Convention"** - The meaning ascribed thereto in Section 16.3.1.

"**Damages"** - Any actual damages agreed upon by the Parties or established pursuant to any dispute resolution procedure described in Article 16.

**"Day"** - The 24-hour period beginning and ending at 12:00 midnight in [HOST COUNTRY TIME].

**"Declared Available Capacity"** - The estimated net capacity in $m^3/s$ of the Complex announced daily by the Company pursuant to Section 6.2.2 which shall equal the Dependable Capacity, less any reductions due to Scheduled Interruptions, Forced Interruptions and Maintenance Interruptions.

**"Default Rate"** - The Base Rate plus [_____] percent per annum. Whenever the Default Rate is applied, the interest shall be compounded [_____], computed for the actual number of Days elapsed on the basis of a 365-Day year.

**"Dependable Capacity"** - The sustained capacity in $m^3/s$ from the Complex as declared by the Company in writing to Client according to Section 10.3.

**"Dispatch"** - The instructions issued by Client in accordance with this Agreement for the Company to schedule and control the operation of the Complex in order to increase or decrease the water delivered to the Client Irrigation System.

**"Dispute"** - The meaning ascribed thereto in Section 16.1.

**"Dispute Notice"** - The meaning ascribed thereto in Section 9.6.2.

**"Emergency"** - A condition or situation that, in the reasonable opinion of either Party, does materially and adversely, or is likely materially and adversely to (a) affect the ability of Client to maintain safe electrical service to its customers, having regard to the then-current standard of electrical service provided to its customers, or (b) present a physical threat to persons or property.

**"Water Payment"** - The meaning ascribed thereto in Section 9.2.2.

**"Water Purchase Price"** - The price which Client will pay to the Company per $m^3$ for Net Water Delivery in accordance with Article 9 as determined in accordance with Schedule 6 hereto.

**"Excepted Assets"** - The meaning ascribed thereto in Section 16.4.2.

**"Financial Closing"** - The signing of the Loan Documents and the fulfillment of all conditions precedent to the initial availability of funds thereunder.

**"Financial Year"** - The period from January 1st to December 31st or such other period as may be selected by the Company.

**"Forced Interruption"** - Any partial or complete interruption of a Unit's generating capability that is not the result of (a) a request by Client in accordance with this Agreement; (b) a Scheduled Interruption or a Maintenance Interruption; or (c) an event or occurrence of Force Majeure.

**"Force Majeure"** - An event or occurrence specified in Article 13.

**"Force Majeure - Natural"** - The meaning ascribed thereto in Section 13.1.1.

**"Force Majeure - Political"** - The meaning ascribed thereto in Section 13.1.2.

**"Foreign Currency"** or - The lawful currency of [_____].

**"Foreign Investor"** - Any Initial Shareholder of the Company who is a non-resident of Host Country.

**"Foreign Political Events"** - The meaning ascribed thereto in Section 13.1.2(b).

**"Government"** – Government of the Republic of Malawi.

**"Guarantee"** - The guarantee provided by the Government under the Implementation Agreement, pursuant to which the Government guarantees the payment obligations arising out of the breach, default or non-performance of Client under this Agreement.

**"Host Country"** - Malawi.

**"Host Country Political Events"** - The meaning ascribed thereto in Section 13.1.2(a).

**"ICC Rules"** - The meaning ascribed thereto in Section [_____].

**"ICSID Rules"** - The meaning ascribed thereto in Section 16.3.1.

**"Implementation Agreement"** - The [DESCRIBE FULL NAME AND DATE OF IMPLEMENTATION AGREEMENT] entered into between Government and the Company.

**“Improved Loan Conditions”** - The meaning ascribed thereto in Section [_____].

**“Initiation Payment”** - The Company's first payment to the Construction Contractor under the Construction Contract which shall be at least [_____] percent of the original Contract Price.

**“Initial Shareholders”** - The shareholders of the Company identified as follows:[INSERT NAMES OF INITIAL SHAREHOLDERS OF THE COMPANY].

**“Insurance Event”** - The meaning ascribed thereto in Section [_____].

**“Interconnection Facilities”** - All the facilities on the high side of the Complex described in Schedule 3 to be constructed by or for Client to enable it to receive and deliver capacity and water in accordance with this Agreement plus the Metering System.

**“Interconnection Point”** - The physical point(s) where the Complex and the Client Irrigation System are connected as specified in Schedule 3.

**“$m^3$”** – Cubic meters.

**“Lapse of Consent”** - Any Consent (a) ceasing to remain in full force and effect, or (b) at any time prior to [DATE], not being issued or renewed upon application having been properly and timely made and diligently pursued, or (c) from and after [DATE], not being issued or renewed within the period of time prescribed by applicable Laws of Host Country as applied in a non-discriminatory manner and, in any event, within [_____] months after the date of proper and complete application therefor, or (d) being made subject, subsequent to its grant, upon renewal or otherwise, to any terms or conditions that materially and adversely affect the Company's and/or the Contractors' ability to perform its or their obligations (including the making available by the Company of Dependable Capacity and Net Water Output as described in Article 2) under any document included in the Security Package; provided, however, that in no event shall any Lapse of Consent occur as a result of the Government or any Public Sector Entity exercising any power pursuant to the Laws of Host Country to take any of the actions referred to in sub-sections (a) to (d) above as a result of the Company or any other party to whom a Consent is granted failing to abide by any term or condition of any Consent.

**“Law”** - Any law, act, requirement (including license and permit requirements), ordinance, code, order, rule, resolution or regulation of any governmental authority or agency (federal, national, provincial, municipal, local or other) that is at any time applicable to the Company, the Complex, the Project, the Site, or any part thereof, and shall include the Laws of Host Country and all applicable environmental standards and hazardous waste laws, as any such law, act, requirement, ordinance, rule, resolution or regulation or standard may be amended from time to time.

**“Laws of Host Country”** - The national, provincial and local laws of Host Country all orders, rules, regulations, executive orders, decrees, policies, judicial decisions, notifications or other similar directives made pursuant thereto, as such laws, orders, rules, regulations, decrees, policies, judicial decisions and notifications or other similar directives may be amended from time to time.

**“Lenders”** - The lenders party to the Loan Documents and the persons who, from time to time, make other credit facilities available to the Company, together, in each case, with their respective successors and permitted assigns.

**“Letter of Credit”** - A letter of credit provided by Client pursuant to Section 9.7.

**“Liquidated Damages Due Date”** - The meaning ascribed thereto in Section 9.5.

**“Liquidated Damages Notice”** - The meaning ascribed thereto in Section 9.5.

**“Loan Documents”** - The loan agreements, notes, indentures, security agreements, interest rate hedging agreements, guarantees and other documents entered or to be entered into relating to the construction and permanent financing (including financing of working capital requirements and refinancing and provision of letters of credit for construction and permanent financing) of the Complex or any part thereof.

**“Local Currency”** - The lawful currency of Host Country.

**“Maintenance Interruption”** - An interruption or reduction of a Unit's or the Complex's generating capability that (a) is not a Scheduled Interruption; (b) has been scheduled and allowed by Client in accordance with Section 6.4; and (c) is for the purpose of performing work on specific components, which work could be postponed by at least [_____] Days but should not be postponed until the next Scheduled Interruption.

**“Maintenance Reserve”** - The meaning ascribed thereto in Section [_____].

**“Major Overhaul Year”** - The meaning ascribed thereto in Section [_____].

**“Major Owner”** - Any Initial Shareholder or any person or other legal entity that (a) owns or otherwise holds or acquires control of, or (b) by virtue of a contemplated purchase or other transfer will own, in either case, [_____] percent or more of the shares of, or voting rights in, the Company.

**“Metering System”** - All meters and metering devices owned by Client and used to measure the delivery and receipt of Net Water Output and Dependable Capacity.

**“Minimum Functional Specifications”** - The minimum functional specifications (including the technical limits of the Complex) for the construction and operation of the Complex as set forth in Schedule 2 hereof.

**"Month"** - A calendar month according to the Gregorian calendar beginning at 12:00 midnight on the last day of the preceding month and ending at 12:00 midnight on the last day of that month.

**"Net Water Output"** - Net water delivered by the Company for sale to Client at the Interconnection Point in accordance with Client Dispatch as measured in accordance with Section 8.4.

**"Notice of Default"** - The meaning ascribed thereto in Section 15.3.2.

**"Notice of Intention to Defend"** - The meaning ascribed thereto in Section 16.2.4.

**"Notice of Intention to Refer"** - The meaning ascribed thereto in Section 16.2.2.

**"Notice to Proceed"** - The meaning ascribed thereto under the Construction Contract.

**"O&M Contract"** - The agreement between the Company and the O&M Contractor for the operation and maintenance of the Complex.

**"O&M Contractor"** - The company which the Company may from time to time appoint to operate and maintain the Complex.

**"On-Going Dependable Capacity Shortfall"** - The amount, if any, by which the Dependable Capacity is below the AIDC.

**"Operating Committee"** - The committee established pursuant to Section 6.9 for the purpose of determining operating standards and procedures for the Complex.

**"Operations Security"** - The meaning ascribed thereto in Section 9.4.2.

**"Operating Year"**- That period of time (i) with respect to the first Operating Year of the Project, beginning on the Commercial Operations Date and ending at 11:59 p.m. on December 31st of the same Year; (ii) with respect to succeeding Operating Years until the last Operating Year, a full Year; and (iii) with respect to the last Operating Year, that period of time from the end of the preceding Operating Year through the termination date of this Agreement.

**"Parties**" - Both Client and the Company

**"Party"** - Either Client or the Company.

**"Peak Months"** - The Months of [_____].

**"Premium Date"** - The meaning ascribed thereto in Section [_____].

**"Project"** - The development, design, engineering, manufacture, financing, acquisition of the Site, construction, permitting, completion, testing, Commissioning, insurance,

ownership, operation and maintenance of the Complex and all activities incidental thereto.

**"Prudent Client Practice"** - The practices generally followed from time to time by the electric Client industry (including practices generally followed by independent water producers) in Host Country, having regard to engineering and operational considerations, including manufacturers' recommendations. Prudent Client Practice is not limited to optimum practices, methods or acts to the exclusion of all others, but rather is a spectrum of possible practices, methods and acts which could have been expected to accomplish the desired result at reasonable cost consistent with reliability and safety.

**"Public Sector Entity"** - The Government and any subdivision thereof, any provincial or local governmental authority with jurisdiction or authority over the Company, the Contractors, the Lenders or the Project or any part thereof, any department, authority, instrumentality, agency or judicial body of the Government or any such provincial or local governmental authority, and any court, tribunal or independent regulatory agency or body in Host Country having jurisdiction over the Company, the Contractors, the Lenders or the Project or any part thereof.

**"Required Commercial Operations Date"** - The date on which the Complex is required to be Commissioned which shall be [_____].

**"Respondent"** - The Party on whom a Notice of Intention to Refer has been served in accordance with Section 16.2.2.

**"Savings"** - The meaning ascribed thereto in Section [_____].

**"Scheduled Commercial Operations Date"** - The date which the Company identifies to Client as the date the Complex will be Commissioned, as such date may be revised from time to time based on the scheduled construction program.

**"Scheduled Interruption"** - A planned partial or complete interruption of the Complex's generating capability that (a) is not a Maintenance Interruption; (b) has been scheduled and allowed by Client in accordance with Section 6.3; and (c) is for inspection, testing, preventive maintenance, corrective maintenance or improvement.

**"Security Package"** - All of the agreements identified in Schedule 9 that are entered into in furtherance of the design, financing, construction, ownership, operation and maintenance of the Complex and that form part of the security granted to the Lenders.

**"Site"** - The land, spaces, waterways, roads, water wells and any rights acquired or to be acquired by the Company for the purposes of the Complex on, through, above or below the ground on which all or on any part of the Complex is to be built, (including any working areas required by the Company and the Contractors, villages, townships and camps for the accommodation of the employees of the Company and the

Contractors, and all rights of way and access from public highways and, where applicable, railway and seaward access).

**"Supplemental Payments"** - The amount which Client will pay to the Company per Month for [_____] in accordance with Article 9 as determined in accordance with Schedule 6 hereto.

**"Technical Agent"** -The independent consulting engineer, or engineering company, of international repute acceptable to Client, the Company and the Lenders for the purposes of monitoring the construction and certifying the results of Commissioning.

**"Termination Purchase Price"** - The meaning ascribed thereto in Section 15.5.1.

**"Unit"** - Each of the generating units that forms a part of the Complex.

**"Client Event of Default"** - An event described in Section 15.2 for which the Company may issue a Notice of Default to Client.

**"Client Irrigation System"** - The Interconnection Facilities and any other distribution facilities on Client's side of the Interconnection Point(s) through which the Net Water Output of the Complex will be distributed by Client to its irrigated parcels.

**"Upstream Owner"** - Any person or other legal entity that (a) directly or indirectly holds an interest in, or acquires control of, any Major Owner, or (b) by virtue of a contemplated purchase or other transfer will hold an interest in, or acquire control of, any Major Owner, and, in either case (a) or (b), such person or other legal entity derives or will derive more than [_____] percent of its gross revenue from the Project.

**"Week"** - Each period of seven (7) consecutive Days beginning at 12:00 midnight Host Country time falling between a Saturday and a Sunday.

**"World Bank"** - The International Bank for Reconstruction and Development.

**"Year"** - Each twelve (12) Month period commencing on 12:00 midnight on December 31 and ending on 12:00 midnight the following December 31 during the term of this Agreement.

**THE FOLLOWING SCHEDULES NOT PROVIDED:**

Schedule 2 -- Minimum Functional Specifications

Schedule 3 -- Interconnection Facilities

Schedule 4 -- Commissioning and Testing

Schedule 5 -- Metering and Telecommunications

Schedule 6 -- Indexation and Adjustment

Schedule 7 -- Construction Reports

Schedule 8 -- Form of Letter of Credit

Schedule 9 -- Security Package

# Annex 5.

# Answers to comments about the WPA report

# 800826 – PRIVATE PARTNERSHIP FEASIBILITY STUDY FOR THE SHIRE VALLEY IRRIGATYION PROJECT

**Department of irrigation**

| **Comments on the brl ingénierie consultancy WPA** | **June 2016** |
|---|---|

| **GENERAL COMMENT(S)/OBSERVATION(S)** | | | | | |
|---|---|---|---|---|---|
| **N** | **No page** | **Sect.** | **comment** | **Answer to the comment** | **Person in charge of the answer** |
| | | **1** | The consultant appear to have done a rushed job. There are some inconsistences between the write-up part and the draft contract. The Consultant should give this part of the assignment the required quality check. | OK, noted | **HBE** |
| **1** | **3** | **the technical specifications** | It would be difficult to specify and agree on the quality (turbidity and acidity) of water. The Client do not have much control on the sediment transport in Shire River, as it depends on a number of factors, mainly upstream cathment degeradation. To be on the safe side, the quality should simply be similar to that of Shire River quality; though it might even be slightly better due to the positioning of the Intake structure and provision of sediment excluder at the headworks.<br><br>Care should also be taken in specifying the supply of water. As supply from Kapichira show seasonal variations depending on draught or excess flow situations, it would be very difficult to guarantee a firm/ specified supply. | **A better quality of water is one of the reason that will attract ILLOVO in the project**<br><br>**If a certain level of water can't be guaranteed, there is no interest for Illovo to get in the project. They can not keep a backup irrigation system from the river in case the quantity of water delivered by the scheme is not enough.** | **BVE** |

| | | | | | |
|---|---|---|---|---|---|
| **2** | **4** | | What is an EPC contract? There is no description for abbreviations in the Report also. | **Engineering, Procurement, and Construction" (EPC) is a particular form of contracting arrangement** | **BVE** |
| **3** | **4** | **last paragraph** | Why should the saved energy be part of the negotiation, as it is fully the property of the Client? | **Because the energy saved could be released to the national grid, which is a positive impact for the country (44.4 M USD) and for Illovo (4.6 M USD)** | |
| **4** | **4** | **first paragraph** | The statement "……. that ILLOVO would account for at least 75% of the revenue of the projected PPP for the phase 1 of the SVIP." Needs further elaboration. How could ILLOVO account for 75% of the revenue? | **75% is may be a too high estimation, it was based on the preliminary report information/financial model. In the new TFS report, for the phase 1, the net Illovo surface is 9995 ha for a total net irrigation area of 21409 ha. In terms of surface Illovo represents at least 46%.**<br>**Unfortunately, the TFS doesn't provide the detail of water requirement per zone which make the calculation difficult in terms of water volume. But under the current consultancy an estimation has been done by the PPP teams that shows that Illovo will required about 45% of the water demand for phase 1. According to the option of WPA describe in the PPP feasibility report , the Illovo contribution to the service provider's revenue will be between 16% to 81%** | **BVE** |
| **5** | **9** | **Table 7.1** | Why investment on secondary and Tertiary canal is included in the analysis? The project will invest only on the Branch ILLOVO canal to connect the Estate with the Feeder Canal. Secondary and Tertiary canals are ILLOVO's responsibility. | **OK fine. Modification have been done accordingly** | **BVE** |
| **6** | **Annex 1** | **WHEREAS: (B)** | The contract talks of power generation facility and energy output in many places and yet the contract is supposed to be about irrigation water supply and purchase. Consultant to do a thorough job on developing a water purchase agreement (WPA). | **noted** | **HBE** |

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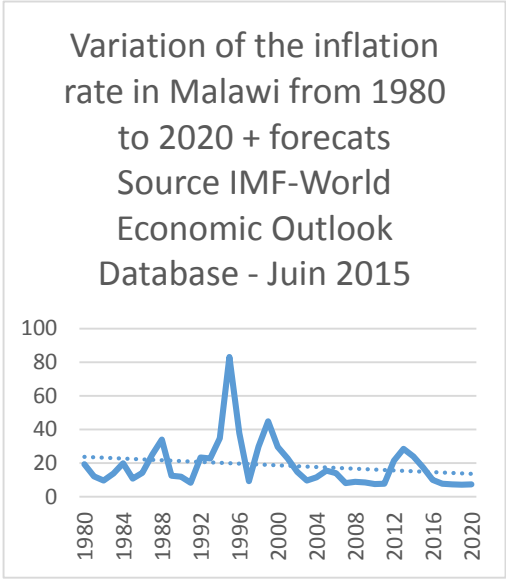
| **7** | **Annex 1** | **Section 6.1.2** | Last but one sentence "…..the projected load profiles……" this reference is more of power that water. Better clean it up. | **corrected** | **HBE** |
| **8** | **Annex 2** | **CAPEX and loan assumption** | The investment cost for the intake and feeder canal is planned over a 2 years period,<br>The investment cost for the branch is planned over a 1 year period,<br><br>In view of the lining requirement of the canals the planned time for completion of the canals may be is short. Three years would be reasonable. | **OK it has been modified as proposed** | **BVE** |
| **9** | **Annex 2** | **General assumptions** | The assumptions listed should reflect on the realities on the ground in the Malawi's prevailing economic conditions. For example national inflation in not at 7%. It is about 23%. | **OK, 7% was a prevision given by the International monetary fund expert on their internet web site.**<br>  <br><br>**The annual local average inflation rate since 1988 to 2016 is 17.15%.** | **BVE** |

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| | | | | **However in the new financial model the cost and the incomes are now provided in USD to avoid the problem of such local currency instability, so the inflation rate considered is 2%** | |
| **10** | **Annex 2** | **Table 7.2** | Which one is Branch 17?<br><br>Again investment on Secondary and Tertiary canals should be out. | **The branch I 7 come from Dr JO's "Illovo design" files send on the 15/mars/ 2016. This branch has been removed in the last version of the report.**<br><br>**Ok noted** | **BVE** |
| **11** | | **Table 7.4** | O&M cost for Secondary and Tertiary canals should be out. | **OK noted** | **BVE** |
| **12** | | **Table: Investment programme and financial cost for the canal option** | Figures in the Table not readable. May be better to look for better way of presenting the table,<br><br>Again Secondary and Tertiary Canals are included in the analysis | **OK noted** | **BVE** |
| **13** | **93** | **Table: Water fees estimation for the canal option** | At the proposed water fee of USD 16/1000 m3, ILLOVO's annual payment would be USD 4.2 million. This is almost near to what the Company is currently paying for power. Moreover, the Company will invest on the internal modifications. In view of these, would the proposed fee attract ILLOVO to be part of the WPA?<br><br>Since the preliminary design of the project is not yet completed, the project cost estimates supplied by the TFS Consultant are only rough estimates. It should be noted that the overall analysis is subject to revision when the actual figures are available sometime in August or September, 2016.<br><br>The sustainable water fees for canal option (Illovo's choice) is over double what the TFS has in their report. Though there is an indication that figures used were obtained from the TFS it would be good for the two consultants to share | **Yes because part of the energy produced and not used will be then send on the national grid. Illovo will also have a better quality water and less O&M annual charge. Even if for one year's the amount of pay is same as what they pay currently in energy it is still interesting in a long term perspective**<br><br>**That is an issue out of the consultant responsibility…..** | **BVE** |

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| | | | notes again so that we are presenting the same picture to government and potential clients like Illovo. | **Ok noted** | |
| **14** | **93** | **Annex 2: Last Table** | The Table should be for Water fees estimation for the pipe option not for the canal option again. | **Ok modified** | **BVE** |
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| **Comment WB** | | | | | |
| **N** | **No page** | **Sect.** | **comment** | **Answer to the comment** | **Person in charge of the answer** |
| | | | The agreement with Illovo will be critical to the financing of the project, whether it's a PPP or not, the rationale and arguments for entering into such an agreement needs to be better thought through and more clearly articulated in the report. It would be better that the consultants focus more of the report on the rationale for the WPA, the process by which it will be negotiated and the risks and mitigation for the government rather than (poorly – showing visible traces of copying a power purchase agreement) drafting a WPA. | **OK modified** | **HBE** |
| | | | ► There is no discussion of the role of government in the agreement and what risks and recourse there might be to government in the event of default by either party. | **It has been included in the present report** | **HBE** |
| | | | ► Also there is no discussion of sequencing and timing of the WPA in relation to the PPP bidding process. Presumably this would need to be negotiated in advance of any PPP bidding process to give assurances to PPP bidders that the revenues will be there to support financing of the project. | **Yes it is right** | **HBE** |
| | | | Concerning the assets that will be solely for the use of Illovo and will be fully financed through the WPA over the life of the concession, would they be transferred to Illovo at | **Not a real issue. The property of the infrastructure without water rights is meaningless.** | **HBE** |

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| | | | the end of the agreement? Presumably not? Again what is the role of government in asset ownership. How does this relate to assets financed on concessional terms from WB etc? | **The government should be concerned about long term sustainability of the project. The question of property is not relevant in this case.** | |
| | | | ► The financing terms in the model are not commercial rates, are they proposing that concessional finance from government be used to finance the initial investment? | **Yes that is the idea** | **HBE** |
| Comment AfDB | | | | | |
| | | | As mentioned in the task team comments, the proposed tariff for Illovo would means they would pay the equivalent of their savings, so there is a need to adjust the analysis | **Their saving is not included the O&M of the pumping station+ even if they pay as much as the saving they will have the advantage of better water quality and benefit on long terms at the end of the WPA** | **HBE** |
| | | | ► The IIry and IIry canals will be developed by Illovo and should not be included in the analysis | **OK noted** | **BVE** |
| | | | The assumption of rate of interest for the commercial debt of the concessionaire (2%) seems very optimistic and should be reassessed. This is more a concessional rate than a commercial rate. | **Yes we took as hypotheses that it will be a concessional rate.**<br>**We can also simulated a higher rate, closer to commercial terms.** | **HBE** |
| | | | ► The consultant should propose an action plan to engage Illovo: it is not clear what the government should aim at during the feasibility stage and what can be done only by the transaction adviser and finally the concessionaire. What kind of minimum commitment should be negotiated with Illovo now? | **The WPA should be negotiated with Illovo prior to any PPP arrangement.**<br>**The commitment of Illovo should be on the tariffs terms, the volume required and the "take or pay" arrangement.** | **HBE** |
| | | | ► The annex on the financial model should be better detailed. | **Ok noted** | **BVE** |
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# Annex 6.

# Minutes of preliminary Negociation with Potential investors

After a review of the various stakeholders present in the region to main private companies were identified as relevant candidate to be involved in the PPP project for SVIP. Members of those companies have then been met by the team various times.

## Press corporation Limited

The PPP team (team leader H. BENABDERRAZIK and the Financial specialist: B.VENNAT) met with Press Corporation Limited in Blantyre on November the 18. This meeting was following a first exchange with Press Corporation that took place in Blantyre end of July. Tow representative of press Corporation were present to the last meeting: Christopher W Guta (General Manager Operation ) and Nyembezi Lungu (operation Officer)

According to Press Corporation the PPP team was the second team involved in SVIP that came to discuss with them. The first one was COWI teams.

Mr Benabderrazik started the meeting reminding the objectives of the SVIP, and providing the detail scopes of the various international team involved into this project . Work plan of the study has been presented.

The first element that the Press Corporation was concerned about was the water tariff and the level of ISC that will be proposed in the SVIP. Mr Benabderrazik responds that the tariff will be defined by the financial model developed under the PPP in a later stage. Then the advantages of a PPP arrangement compared to a classic public service in the field of irrigation has been reminded.

Mr BENABDERRAZIK presented the purpose of the meeting:

- The PPP team wants more information about Press corporation project (currently Press cane is developing around 200 ha in Chikwawa region for sugar cane),
- How is going the negotiation with local communities in order to secure the land?
- Is there any scope for providing them with water in the SVIP?
- What are their potential involvement in participating in the PPP arrangement by running the infrastructure?
- As one of the biggest agribusiness national company what are their feeling about the project?
- What could be the crops that they would like to develop in the SVIP?

The General Manager was wondering if the project will effectively take place. The answer was that yes, as the WB and ADB have committed themselves to consider financing the project (one of the biggest issue in this kind of project) and if the public authority deals properly regarding the pre-condition to support the project it might be successful. In this regards the public authority has hired good international expertise, all the conditions are then met to implement the project. Even if the maturation of the project took long there is now good chance to realise it. The economic policy/condition in regard to the dialogue with the main donors is also an important point in regard to the implementation of the project, but it is out of the scope of the international teams involved in SVIP.

Mr Benabderrazik also remind that the Nacala corridor which is an ongoing project, will also be a huge booster for the profitability of the SVIP (reduce transport cost, open the region to other regions/countries) it will provide an added value for the project.

Press Corporation general manager provide some more detail about their ongoing project: they will use the 200 ha to produce ethanol from sugar cane. They want also to develop a by-product: NRJ (bagasse conversion). The community continues to be highly engaged. Press Corporation has an internal staff dealing with out-growing issues. They want to be able to measure impact of the project on communities. They have recently recruited a consultant firm to provide independent support to communities in terms of capacity building. They want the community to fully understand the project and the involvement required. The kick start was the establishment of a cooperative society called Kamacgrocp (Katounga Macena cane growers association LT). Under the project they will prepare the land, bring in water infrastructures, plan crop, etc. Press Corporation has brought an international engineering firm (Cardinal) to design the irrigation infrastructures. The design study undertaken by Cardinal is funded by EU. In terms of farmers organisation they want to develop the same model than Patha model, the main concerns is how to finance it in order to avoid problem such the ones that Kasinthula faced. The plan is to have 65% of the investment cost coming as a grant from donors and the remind 35 % will be mobilised from financial market. Those 35 % correspond to the first years operational cost (planting/ water/ input). They will then be reimbursed on short time. This arrangement should avoid problem such in Kasinthula. Currently Press Corporation is still looking for the 65% of grant, however they have good hope that once the design study will be achieved that African Development bank could be interested by the project. The development of the processing plan is also an issue, but they are mobilising their own financial link in order to have the plant in place for Avril 2017. For us to be able to process cane at that time, they need the cane to be growing by latest June 2016. Everything must be solved by this time (land clearing/infrastructure/electricity…). It is an ambitious time line, but they will do their best in order to succeed.

Mr Benabderrazik asked about the reaction of communities landowners in regard to negotiations for the land. Press Corporation answer that there is a high number of delegations from the communities who want to come-in in the project, they are very interested and they don't want to wait more.

A comment has been raised by PPP team about the sustainability to base business development on 65% of grant, although there is some precedent.

Press Corporation added that in their project they will be producing ethanol and energy. Energy will be for local, international market and for their own unit. The energy component is important. Currently the plant design is for 5 MW (generated energy capacity), but given the biomass that will be created by their project, they will think about increasing the capacity to 15 MW. According to the kind of cane they intend to grow, they can maximise on energy side instead of sugar. Moreover, Instead of burning the cane they would like to invest in harvesting technology to powder the leaves and produce pellets that will come in addition to the bagasse in order to increase biomass. It will also has the advantage to allow for energy production all years round instead of only during sugar cane harvest time. Ethanol outlets will be for local demanded in term of national blending mandate. It is part of the blending market which is about 20%. In addition Malawi want to move to 100% ethanol in the vehicle. It is then a long terms vision project

The PPP team tried then to know if there was any scope for connecting Press Corporation's project with SVIP. The answer was definitively yes, however they currently have their time line and they have to respond to it, but their infrastructures designer have the instruction to put a cabin point to connect from the SVIP.

PPP team was wondering about the variation of international sugar price and the potential impact on their project. Press Corporation respond that in their business plan, they will be independent of the international sugar price, so the project is still profitable even with current price. Regarding the price paid to the farmers, they already have the structure and can't go below but they need to be partner with Illovo to avoid any problems from farmers. They want to be sure that there is collaboration between out growers and millers.

Regarding the question linked to the agriculture development strategy and crops that could be developed in the valley, the Press Corporation answer that if they have more land, they would expend sugar cane but with different varieties (energy cane). They are currently in contact with Brazilians to find arrangement about this issue. The sugar cane variety they want to introduce has high yield with irrigation and it maximise bagasse. They already have around 400 ha where farmers are expressing interest to participate to their out grower program. With that level of out growers, it would permit to develop their 15 MW plant according to their plan. This more ambitious project will required around 20 Million dollars of investment and also might require insurance from government in terms of energy strategy for the whole country.

Press Corporation adds that the Shire Valley soil is good for almost any crops. Therefore they could also develop maize area (for the same purpose: convert the biomass into electricity and into biodiesel). They could also be interested by any crops or agro forestry, as long as the crops can be processed to created added value and the wastes can be processed to produce energy. it can be any crops or any agro forestry product. According to Press Corporation the SVIP could almost feed the enter country and also produce energy.

The PPP teams told them that Press Corporation has to organise a meeting with the ASDT in order to discuss this issue.

Press Corporation underline the fact that the land tenure issue is critical in regard to the potential investment in the valley.

Mr Benabderrazik asked about the potential interest of Press Corporation in being partner in the management of the future irrigation scheme. Press Corporation said that it would not be out of their scope if it becomes a utility. If a business plan is created and the investment requirement clearly identified, they could considered the option and be candidate for the management of the scheme, alone or with partners. The general manager added then that one of the point of the company is to be a responsible citizen, to share expertise with communities and that If there is a business and revenues to be generated and share other added value to be created they will considerate the proposition.

Regarding the Press Corporation opinion about the small farmers' organisation, they said that they would prefer cooperative instead of individual. If cooperatives manage the production, economy of scale can be achieve. If other alternatives could be better why not, otherwise cooperative groups is to promote.

## Illovo

The negotiation with Illovo is a critical issue, both (i) to define technical options (is Illovo in or out of the project) and (ii) to structure the PPP arrangement. The number of representatives of the SVIP consultancies' team already in contact/negotiation with Illovo became an impediment to guarantee an efficient negotiation (local Illovo team was complaining). Moreover the negotiations at national level (Illovo Government) do not seems to be promising as the decisions regarding investment/strategic orientation are taken by the group head office in Durban. The PPP team decided then to enter into negotiation with Illovo group head office through a third person working as development consultant for the group at the head office level.

During the mission carried out in 2016, Hassan Benabderrazik met with the General Manager of Illovo. He asked some update about the project because he was aware about it since long time but nothing has never been done.

Mr Benabderrazik reminded the various phases of this project as well as the main issues and hypothesis that were raised by the PPP prefeasibility SVIP study. One of the point was that at that time, Illovo was able to become partner of the project, and Illovo was in position to plan expansion of his factory and development of new irrigated areas. The idea was to provide Illovo with water delivered by gravity from a high level canal. The main advantage for Illovo was then to avoid pumping costs. The other point was that instead of having a public institution managing and operating the infrastructure, it could be done by the private sector. In this case the private sector would be in charge of O&M in the scheme and fund part of the investment. The private companies organised in Special Purpose Vehicle, would become the WSP and would receive a grant from government in order to reduce the level of ISC (in regard to the capacity to pay of the users) and would get return on equity and debt through the ISC paid by the final user.

Mr Benabderrazik remind that he proposition of managing the scheme though a PPP and more precisely through a concessional agreement could have various benefits:

- The Private sector could be more efficient in his way to manage the scheme
- The Private sector could bring in his international knowledge in terms of scheme management

He also informed Illovo that since the last study, the Government asked for and obtained from the World Bank and African development bank fund to finance part of the project and now, the ministry of Agriculture irrigation and water development is in charge of the new studies.

The issues about water conflict between ESCOM for electricity production and SVIP for irrigation has been settled and it has been reminded that the priority has been given to the development of irrigation instead of the increase of power capacity of the ESCOM plant.

Mr Benabderrazik also said that for the time being, no detailed design was decided and that no specific crops was defined for the 6000 ha of new irrigated land.

Then the discussion deals with the new conditions in the sugar market since the prefeasibility study mentioned above. Because of the big change in sugar market the rational for Illovo to join the project became less evident.

The general manger of Illovo has confirmed that the condition for selling sugar to European market has strongly changed and that now the selling price is below their production cost. It is not possible anymore to sell all the production on the European market and as the local demand represents less than 50 % of their production, they have to target the regional market. The problem is that all the sugar exportation represents now a loss for Illovo. Today the extension of the sugar plant and of the sugar fields is not any more an options, they are not any more in a position to plan new investment and they are in a profit warning process. However, they would be interested to by water from SVIP. They can't afford to be equity partner, but they would be interested to go for a ***water purchase agreement***. By integrating SVIP Illovo could save power from their pumping stations and then sell it to the national grid as the selling conditions becomes acceptable.

Mr Benabderrazik obtained the commitment of Illovo that under acceptable conditions in terms of price, they would be interested to sign a water purchase agreement. However if no agreement are found re the price conditions, Illovo will switch back to pumping station

After having reminded that Illovo has good local experiences in terms of agriculture development and outgrowers management, Mr Benabderrazik discuss the interest of Illovo to take part of the development of new irrigated land even if it is not based on sugar cane production. He also discuss the fact that the SVIP farmers have to produce cash crops because part of the infrastructure funding will be done in foreign currency and that will required to have part of the profit generated by the project in foreign currency in order to reduce the commercial risk. In fact the revenue made by the water service provider will have to pay back the equity and the debt service. Using local currency is far too risky because of the huge interest rate and the devaluation of the Kwacha.

It was remind that in the initial project the success of the PPP was based on sugar cane production. We need now a new a cash crop because we can bet any more on sugar. Cotton could be an option, but it need an aggregator. The aggregator could be external or internal to Illovo. If it is external to Illovo and than finaly the sugar price rise again, it will be more difficult to switch back to sugar cane.

Illovo answer that they can't see an improvement in the sugar price over the next 20 years. They also said that were not particularly familiar with cotton but growing crops and organising the outgrowers in trust or coop are their core business, so if new area are available they can grow other crops that sugar cane and they can work with farmers to organised them. However they would not like to involved themselves in outgrowing arrangement with smallholders unless they are organised in commercial farms. In terms of crops they have for example experience in barley production. SVIP has competitive advantage for the production of this crop and it could be sold as cash crop if it is exported on international market (example of South African breweries).

# Annex 7.

# Answers about the PPP draft feasibility report

# Public Private Partnership Feasibility Study for the Shire Valley Irrigation Project

**DRAFT COMMENTS ON FEASABILITY REPORT – BRLI** | **OCT 2016**

| GENERAL COMMENT(S)/OBSERVATION(S) | | | | |
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| **Item** | **Section Ref** | **Observations** | **Comments** | **Answer to the comment** |
| 1 | | The WPA is not complete and is not reflecting a WPA. | The consultant should prepare a full programme to show where it starts and stops. The information on metering and telecommunications has not been provided. | We don't understand what is à WPA full programme?<br>The WPA we have provided is a draft that need to be adapted to the national context<br><br>It is considered at this stage that the water will be delivered to trusts and then that the measure of the volume delivered will be possible. In case of an organization into trust the breakdown of the water consumption can be done directly proportionally to the surface (per hectare).<br><br>Providing the technical details regarding metering and telecommunications is out of our scope of work |
| 2 | | | The consultant is supposed to do a sensitivity analysis. | The financial model already deals with 4 types of contracts (Concession/Lease/affermage/management contract); with 2 level of investment CAPEX (Illovo canal and Illovo pipe) and with 3 various water tariff level (sensitivity on the Irrigation service charge) which provide financial results for 15 cases. The sensitive analysis to be interesting, need to be done on a limited number of cases. This analysis can be done in the next report when technical options and tariff options will be better defined. |

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| | | | | As built, the model can provide sensitivity on CAPEX/OPEX/level of collection fees for the various users (Illovo/other trust/new development area/area A).<br>The Value for money analysis has been carried out with various level of collection fees for the new development area (95%; 70%; 60 %) and with various level of investment cost (according to time overrun) |
| 3 | | Preamble is not good enough to express what's being expected in the report. Needs better elaboration, | | The preamble has been completed to recall the expectations of the report. |
| **SPECIFIC COMMENT(S)/OBSERVATION(S)** | | | | |
| **Item** | **Section Ref** | **Observations** | **Comments** | **Answer to the comment** |
| 4 | Chapter 2 | It is appreciated that the Consultant has critically reviewed the Technical Feasibility Study –Options Assessment Report and the Interim Report of the Agricultural Development Strategy. | Some of the comments are relevant and constructive while others are based on wrong information/misunderstandings that gives negative impressions to the reader. In general, the comments have been forwarded to the respective consultants for their appropriate action and responses. Meanwhile, the TF noted that;<br>- The comments on the reports of the other consultants (ADPS and TFS) should have been summarized and discussed with the specific consultants,<br>- The consultant (PPP) should have given an opinion or suggestions in regards to the gaps noted in the other reports,<br>- References in most cases have not been given to justify the comments, | Some exchanges with the TFS team have been organized in November 2016 and then by email, but it was difficult to organize another exchange time between end of May (reception of TFS report) and the beginning of July (deadline for the Consultant report delivery). However, the remark will be taken into account for the next stages.<br><br>The consultant realized the reviewing in the perspective of establishing the PPP project.<br><br>The references missing have been indicated in the text. |
| 5 | Soils, 1st paragraph | | The statements which say:<br>- that SVIP area is not suitable for maize,<br>- Zone C is not suitable for irrigation,<br>are not true as they are based on old references. They should be deleted as they give negative impression to the project. In any case these will | The text has been modified consequently. |

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| | | | be verified by ADPS and the recent soil study conducted by TFS. | |
| 6 | Table 2-1 | | The table on water availability is wrong which gives negative impression to the reader. The table shows Q70 and Q80 flows based on the data collected at Station 1L12 in Chikhwawa from 1949 to 2009. However, the data is wrong, as recording at the station started since 1977 (not 1949). The table needs to be removed from the report and replaced with the water availability assessment results shown in the latest Option Assessment Report of TFS. | The references of the table have been corrected according to Atkins report.<br><br>It is difficult to reference the water availability assessment results from TFS as it is not presented on a monthly basis in the report that the Consultant has reviewed. |
| 7 | Cropping pattern | | This should also be amended as per the comments given on comment No 3 above, | Done |
| 8 | 3.1 WHY A WPA? Last paragraph | | "……the project will need dedicated infrastructure, either a canal or pipes from the feeder canal to serve exclusively ILLOVO" is no more true. General consensus have been reached between the Client, WB and Consultants (COWI, TFS and ADPS) that Illovo should share the canal with local farmers to address social issues, | Ok, the text has been modified accordingly and considering the water consumption for local farmers is negligible compared to ILLOVO water consumption. |
| 9 | 3.2.2 | | Water quality issues particularly that of turbidity have been maintained in this report although it was previously commented that this is difficult to specify. Again quality should be the same as that of Shire river, which ILLOVO is currently using for irrigation. A sediment settling basin will be incorporated in the design which will improve the sediment content batter than Shire River. Other than that it would be difficult if not impossible for the Client to filter and improve the turbidity of shire River, | The issue is not to define a high level of water quality for irrigation but to define as precisely as possible the service to be delivered (for quantity and quality). It could be settled that the water quality should be as a minimum similar to the quality of the Shire river especially during the critical periods for example. |
| 10 | 3.4, first Paragraph | | It should clearly be stated that the infrastructure belongs to the Government throughout and after the expiry of the WPA | The text has been clarified:<br><br>Illovo canal will normally belong to Illovo (according to the level of Illovo participation)- but as the infrastructure value is depending of the water right linked to it, it is not a problem. |

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| | | | | The infrastructure for the other WPA belong to the State throughout and after the expiry of the WPA |
| 11 | 4.0, 1st paragraph | | The Consultant could have presented a summary of all the PPP arrangements together with their pros and cons and explain why the concession option is chosen, | The synthesis of the PPP arrangements options and the recommendations of the Consultant as settled in the Preliminary assessment report have been more deeply recalled in the introduction of §4. |
| 12 | 4.1 Risk Allocation | | ……"A concession covers an entire infrastructure system (so may include the operator taking over existing assets as well as building and operating new assets)". Which assets? The major infrastructure or even including on farm works? Assets should be specified,<br>The risk that the available water is insufficient for irrigation should partly be shared with Govt. the water source is currently under the control of Escom and as such Govt. has a role to mediate water sharing arrangements between ESCOM and the PPP partner,<br>Demand risk - With a project of this nature there is little room for the private operator to do to attract new users beyond the existing organized farmers. Let the consultant run a sensitivity analysis to determine the collection levels that can maintain financial sustainability of the project, | The text has been clarified.<br>"an entire infrastructure system" does not include the all irrigation scheme from the intake to the plots, but a specific and precisely defined infrastructure system (for example: the intake and the Feeder canal) and all the assets that belong to this system.<br><br>The mitigation measures provide for establishing clear rules between ESCOM and the private operator of SVIP (settlement of an agreement between the parties for example) – and require then the government implication to settle such an agreement<br><br>Regarding the sensitive analysis please refer to the answer of the comment 2. It has been considered in the model that the collection rate will be 100% for Illovo and other trust and 95% for the "new development area" and "zone A". The risk of recollection will be really reduce in this project by the commitment of the users through the WPA, and the organization of the farmers. If main of the farmers are organized into trusts, each trusts should be considered as 1 client. The numbers of client for the Scheme manager will be then reduced compare to a smallholders irrigation scheme, where each farmers is considered as a client (expected if they are organized into WUAs who then can be considered as the client). |

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| 13 | Table 4-1 | | ESCOM should be relived of the Risks allocation In case of water shortage and instead the Public sector should take that risk. | As ESCOM is in charge of the water control, it is better that ESCOM is directly involved. But then the risk allocation for ESCOM can be taken by the public sector depending of the ESCOM arrangement with Public authority. It is apparently clear that the priority as being given to irrigation, if ESCOM doesn't respect the priority sanctions should be taken against ESCOM. |
| 14 | Table 4-2 | | The consultant should explain more on the need for the risk assessment matrix because it has a cost implications on the models. Why do we need to Identify the risks?<br>Regarding the Risk impact/ probability, it should be noted that flooding has a high probability as well as impact, | The risk assessment matrix is required because the risks have a cost to be covered and then an implication on the financial model. The object of the tender is also to hire a private operator able to undertake its mission that means to select an offer presenting a realistic consideration of the risks of the private operator and then a realistic financial proposition.<br>Based on the risk assessment, mitigation measures can be proposed in the contract to reduce or to share the risk, in order to keep the private sector interested in the project and/or to keep the public authority interested by a PPP arrangement.<br><br>The risk of event beyond the control of either party, such as flood, has been raised in the matrix, in the cell (high probability and major consequence) |
| 15 | 4.2 first paragraph | | The statement "….ILLOVO would account for at least 16% to 81% of the revenue of the projected PPP for the phase 1 of the SVIP" needs to be explained, as the variation is too big. | The variation is explained p48 (a reference link has been added p30). The variation is explained by the infrastructure to be chosen for Illovo water supply (canal or pipe) and the different options of WPA. |
| 16 | 4.3 | | Monitoring unit should be composed of various professionals not institutions as shown on figure 4.1; and there is a need to set up an establishment that will be monitoring the day to day activities,<br>The draft key performance parameters for monitoring have only included technical aspects. It would help if they also including monitoring aspects for financial | OK done, The Monitoring unit is the establishment and is composed by representatives from the institutions, who should be professionals in the fields required and trained for the PPP monitoring. For punctual issue, some outside specialists can be hired for specific missions. |

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| | | | performance and potential key contractual obligations. | The Figure 4.1 has been modified<br><br>The KPI are linked to financial penalties or incentives, however in the contract a number of deliverables can be required to the Private sector in order for the Monitoring Unit to monitor his activities: Example of reports/deliverables asked to the private sector has been added in the report |
| 17 | Figure 4-1 | | The institutional organogram shown on the figure should exclude the president and the prime minister to suit the situation in Malawi. | The Figure 4.1 has been updated |
| 18 | Table 4-3 | | Under the Key performance Indicators table 4-3, a Quality assurance column should be added.(This is for the supervisor to act as the eye for the Client) | Done |
| 19 | 5. FINANCIAL ASSESSMENT | | In general it was found difficult to fully understand/follow up the Chapter as the XL file for the Financial model is not provided with the Report,<br>For the interest rate in the financial model has it already included additional charges such as disbursement charge, commitment fee e.t. c. When these are taking into account the finance cost in total is usually higher than 4.5% assumed. | Ok, noted. If necessary this assumption about the interest rate for private sector will be modified in the next version of the model. At the time of the present assessment a rate of 4.5% was quite a representative number for international private loan. |
| 20 | 5.1 (first paragraph) | | Typo error (currency should be in MK and USD) and not in MK in USD | Done |
| 21 | Table 5-1 | | The figures are not adding up to 42, 500 hectares. They have to be adjusted based on the latest project area map prepared by TFS, | Done (the mistake on the surface of phase II has been corrected) |
| 22 | First bullet | | Assumptions made on public loans should be verified | These assumptions have already been discussed with the WB. The value used was considered as representative. If the WB or ADB |

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| | | | | or the Malawi government can provide us with more accurate figures in terms of interest rate/grace period/duration, we will use them in the next version of the model |
| 23 | Table 5-2: CAPEX Phase 1 and 2 | | It should be noted that the project cost estimates given on the table are pre-feasibility level estimates that need to be revised when the feasibility level estimates are available by TFS sometimes in August or September, 2016. All the financial model analysis shall be revised accordingly, | Yes. The model will be updated according to the feasibility report of TFS. The observations and comments regarding the model will be taken into account at that time. |
| 24 | Table 5-2: CAPEX Phase 1 and 2 | | Illovo Canal/Pipe option- does Illovo has a preference? will they be prepared to pay more for the pipe option? | It is difficult to say at this stage as the preliminary discussion (Annex 6) was not based on prices yet. This is to discuss during the negotiation process. |
| 25 | Table 5-3 | | Assumptions for the starting date of the construction to be 2017 is unrealistic. Should be changed to 2018. | This will be corrected when the model will be updated after receiving the feasibility report of TFS |
| 26 | Table 5-4: O&M assets | | The table has underestimated the required assets for O&M. Assets should also include Offices and Staff resident buildings, heavy duty O&M machinery (Bull dozers, excavators, loaders, dump trucks, etc) which could be substantial. These are required for the maintenance of canal, drains, night storages, principal and service roads, flood protection dykes, etc. Required number of vehicles are also underestimated for O&M of all these main infrastructure. Instead of renting these buildings and machinery for the duration of the concession (Table 5-8), it would be much cheaper to own them from the beginning, | The table 5-4 shows the cost of the O&M assets only but buildings, heavy machinery is considered to be rented (cf. table 5-8) and then does not appear in table 5-7.<br>The O&M asset proposed have been estimated taken in account an efficient private sector scheme management unit in charge of 21 409 ha of irrigation scheme and a reduced number of water users (organization of the farmers into trust)<br><br>As the financial model will be updated with the data from the feasibility report, the Consultant can modify the model and include the buildings and machinery in the O&M assets at this stage if the decision is taken to go for a concessional arrangement. In case of other type of arrangement such as management contract (short time contract) the comment about buying instead of renting, becomes non relevant. |
| 27 | Tables | | Tables 5-4 to 5-7 are not well referenced in the text. | Done |

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| 28 | Table 5-7 | | Conversion rates are much lower hence should be revised to suit present situation.<br><br>Staff for operation and Maintenance have been underestimated. Skilled staff like heavy duty machine operators, water bailiffs and gate operators, need to be included,<br><br>There is a need to revise the rates also to reflect situations in Malawi, | Yes, it has been updated in the table 5.4 ; 5.7 and 5.8. The exchange rate used is the one of July 2016. This rate will be update again in the last version of the model. However as the assessment is done in USD the figures provided in MK were just indicative and did not impact on the final results provided in the report<br><br>The renting of the machinery table 5-8 includes the operators.<br>The collection fee agents have been removed considering that the private operators will deal only with few clients (trusts) and no smallholders.<br>The work staff (waterman; specialized workers etc.) will be updated according to the feasibility study (kind of regulation, delivery points to be considered according to the design, etc.)<br><br>Which rate? We can adjust in the model… |
| 29 | General Comment | | contingencies should be consistent throughout the Report or give reasons for the discrepancies, | OK, the highest rate of contingency will be used in the next version of the model in order to minimize the risk. (contingency of 25% will be considered for tables 5.4 and 5.8) |
| 30 | Table 5-18, | | Why is a concession fee to government has not been included in the Table, | In a concession contract, the financial cost of the investment is supported directly by the private operator (unlike lease or affermage) – this is why there is no rent for the Public Sector.<br><br>However, the financial model takes into account a water abstraction fee for the National Water Authority (cf. § 5.1.4 and Table 5-10 p51). |
| 31 | Tables 5-22 to 5-25 | | Indicated Proposed prices, such as variable part (USD2016/m3), fix part (USD2016/ha), etc. is not clear. Show clearly the proposed water tariff/cost of water for the different entities under the four options, preferably in a form of table. | A synthetic table has been added. |

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| 32 | 5.2.2 | | The consultant should use tariffs from Southern Region Water Board (SRWB) and not Blantyre Water Board (BWB) since the area is under SRWB. | OK done, §5.2.2 modified and annex 3 replaced, however the component of potable water has until now not being taken in account in the Financial model because of a lack of technical information about this component in the TFS |
| 33 | 5.2.3.1 | | The consultant need to explain more on how the price adjustment coefficient was calculated and which crops were considered. | The figures provide are only example, the inflation rate, the labor cost variation and the fuel cost variation have to come from national statistic. The rates (15% / 30 % / 20% /35%) proposed in the example are usually defined based on the proportion of each component in the water cost. In the example, the 30 % linked to labour cost means that the water cost is composed for 30% of the labour cost, etc.<br>The rate linked to the average crop production price variation gives a certain importance to the ability of the farmers to pay, but doesn't represent a true component of the water cost.<br>The crops to be considered are the main crops of the cropping pattern allocated to the area. |
| 34 | 5.3 | | The consultant need to explain more on how the Value for Money Analysis was done. | OK Done.<br>The probabilities used come from the consultant international experience as despite of our various requests, we never obtained from the national institutions, local value of cost over run and ISC collection rate.<br>The investment cost expectancy for each kind of agreement (no PPP; concession contract; etc.) is the weighted average of the investments according to their probability (idem for the incomes expectancy).<br>The current investment cost for each case (investment done with no delay; with one year delay; etc.) is the sum of investments done over the investment period (cf. table 5-3), taking into account an inflation rate of 2%. If there is one year delay, the investment is made between 2018 and 2020 instead of between 2017 and |

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| | | | | 2019 so that it will increase the current investment cost. |
| 35 | Annex 2 | | The detail of the financial calculation has not been provided in separate Excel files for consultation, | OK the excel file can be provided |
| 36 | Annex 4: Draft Water Purchase Agreement (WPA) | | Legal aspects:<br>It was enough to discuss the rationale and objective of the WPA and leave the terms to be discussed later having agreed in principle on the need to have the WPA. However, here are few comments:<br><br>(1) Conditional precedents: there may be need to have conditional precedents. In other words the signing date may be different from the effective date. It is not clear if the pre- operation provisions as stated refer to condition precedents.<br>(2) Penalties for non-performance- what happens if one party is not performing? Not all non – performances must result in termination<br>(3) Termination procedure_ not there and must come out clearly<br>(4) Environmental, safety and quality provisions – not there<br>(5) Risk allocation provisions eg defects liabilities<br>(6) Stabilization provisions- what happens when there is change in law say for instance environmental laws that may have material adverse effect on the project<br>(7) Warranties must come from both parties not just the Company<br>(8) Performance guarantees – in some instances you may want to have guarantees of this nature. | Ok, the terms will be discussed later.<br><br>(1) A required commercial operations date is defined in the WPA (the date on which the Complex is required to be commissioned) – cf. section 2 and 3 and the definitions part.<br>(2) Yes, the WPA will cover liquidated damages due to for example delays in commissioning, shortfalls in commissioned capacity, water delivery shortfalls and the payment of liquidated damages (section 9.3)<br>(3) It is explained section 15 but may be clarified if required<br>(4) Ok. To discuss<br>(5) The section 11 provide the required insurance to cover risks but some provisions can be added if required.<br>(6) From section 13.1.2, change in law are considered as "Force Majeure" and then is applied the provisions of section 13.2 and 13.3.<br>(7) The Customer engagement is at buy water to a specific price (that includes the payment for the capacity set aside and the payment for the water effectively supplied) and in the defined conditions (as the currency used for the payment, etc.). The Customer should provide a letter of credit to guarantee payments (section 9).<br>(8) Yes. It is necessary to describe precisely the service to be delivered (quantity, quality of the water, delay in delivery, etc.). |

| GENERAL COMMENT(S)/OBSERVATION(S) FROM ADB | | | | |
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| **Item** | **Section Ref** | **Observations** | **Comments** | **Answer to the comment** |
| **37** | **Chapter 5.1** | The report is not conclusive concerning Chapter 5.1 financial analysis | Conclude and advise the best options for the concession | A § 5.1.7 has been added to conclude Chapter 5.1 |
| **38** | **Chapter 5.1** | The financial assessment is based on the tariff assumption. For the tariff, the consultant considers that option 3 is the best option. This means that the private party investment will be between 1% (Illovo canal) and 7% (Illovo pipe) of the Capex | With a so limited contribution, what is the interest of a concession? Wouldn't a lease or affermage be a better option? | See § 5.1.7<br>The interest of the concession remains considering the level of risk (operational, commercial, exchange rate risk) that is assumed by the private operator compared to a lease or affermage contract.<br>In terms of incentives the concession remain also better than the other proposed arrangement. |
| **39** | **Chapter 5.1** | The financial assessment is based on very low tariff, for Illovo as for the smallholders:<br>- the tariff proposed for Illovo corresponds to a total water fee for Illovo of about USD 1.6 m (14000 ha * 75USD/ha + 290.106 m3* 0.002USD/m3). Meanwhile, according to the TFS, Illovo's savings in terms of pumping O&M costs amount USD 4.6m<br>- for small holders, considering two crops a year for a total water consumption of 10000 m3/ha.year, the water fees amount 21 USD/ha.year in area I-1 and 85 USD/ha.year in Area A. Given that the gross margin per year varies from 580 USD/ha for a rotation Soya | The tariff setting should revised with the objective of increasing the private party contribution in the capex while keeping the tariff in a range affordable by the smallholders and financially interesting for Illovo | It is true that the ISC level (and mainly the variable part/m3 of the tariff) could be higher for Illovo but also for the other trusts, however this is more a political decision. The consultant has proposed 4 different levels of tariff based on various assumptions made about the costs that have to be cover by the ISC. The proposed tariffs makes the scheme sustainable by covering all the costs taken in account.<br>The benchmarking about the ISC on the other irrigation scheme in Malawi shows that the ISC is between 62, 000MK/ha and 100,000MK/ha, Which is close to what is proposed in our option 3 of the WPA.<br><br>If it is considered that the potential energy savings from ILLOVO should be part of the negotiation, the pricing options needs to take that into account – this is not the case in the current |

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| | | beans/Maize to 1750 USD/ha for sugarcane according to the crop budgets, the water fees proposed for option 3 seem on the low side | | model. The model will then be updated considering it (after receiving feasibility study from TFS). |
| SPECIFIC COMMENT(S)/OBSERVATION(S) FROM ADB | | | | |
| **Item** | **Section Ref** | **Observations** | **Comments** | **Answer to the comment** |
| 40 | **4- Institutional options to organise the contracting authority** | | This chapter should discuss the Special Purpose Vehicle: what kind of statute, Government share, etc. | The SPV is the private sector that will organised himself to become the Water Service Provider. It will be considered as a private company.<br>The various options for the SPV (fully private/semi-public) as already be discussed in the preliminary report section 5.3 proposed PPP options and phasing issues of the project". In any case the SPV will be considered as a private company. It can be a single private company or a consortium of various private company |
| 41 | | | This discussion about the SPV should be reflected in Figure 6-1: Contractual relationships between the parties | The SPV is the Private sector. The acronym SPV has been added in the figure |
| 42 | **4.2- The relation between the ppp for svip and the wpa** | In this chapter Illovo is presented as a major asset for the feasibility of the project under a PPP scheme. However, Illovo's financial sustainability is purely based on sugarcane. | This chapter should discuss the sugarcane market prospects and consequences in terms of risk on a PPP scheme. | A § has been added in the chapter 4.2. |
| 43 | **5.2.1 Agricultural ISC and pricing calculation**<br>**Tariffs options** | | Tariffs should be the same for new developments (zones I-1 and A). Having different tariffs inside the scheme for new developments may raise social issues, unless there is a strong technical justification such as the pipe option for Illovo for example. At first sight, there should be only two or three different tariffs: | The tariffs have been calculated considering the investment required for each zone – which is different depending of the location (length / size of the branch); the type of infrastructure required (siphon for zone A / pipe for Illovo) etc. and in the logic that a WPA is defined and negotiated with each |

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| | | | - One for the existing schemes (Illovo, Kasinthula, etc.), or two if the pipe option is selected by Illovo;<br>- One for the new developments; | trust and with Illovo – so that the WPA takes into account the specific conditions of each situation<br><br>However, an equalization can be applied – except in the case of possible specific demand as for the pipe option for Illovo.<br><br>As the model will be updated with the data coming from the feasibility report of TFS, the ISC calculation can then be smoothed as demanded. |
| 44 | **5.2.1 Agricultural ISC and pricing calculation**<br>**Tariffs options** | | For option 1 for which all capex costs are included in the water tariff, why do Illovo and existing trust tariff differ? An equalisation should be applied, except in the specific case of the feeder pipe for Illovo | Cf. Previous answer. |
| 45 | **5.2.1 Agricultural ISC and pricing calculation**<br>**Feasibility of the variable part of the tariff** | The report is silent on how the variable part of the tariff will be applied. | If a measure of the volume delivered by the concessionaire to the trust or WUA is possible, it is difficult for these organisations to measure the volume delivered to each user in order to pass on the water fees. The consultant should propose feasible modalities to 'invoice' this water volume to the end user (e.g. calculating a lump sum based on the type of crop). | It is considered at this stage that the water will be delivered to trusts (and then to relatively few clients) and then that the measure of the volume delivered will be possible. In case of an organization into trust the breakdown of the water consumption can be done directly proportionally to the surface (per hectare).<br><br>In case the water is delivered to WUA, then an annual declaration of irrigated crops acreage can be used by WUAs to estimate the total amount of water that will be supplied to each user and the water fees each user will have to pay. The water fee is then determined by calculating a lump sum based on the type of crop.<br><br>Depending of the recommendation on the farmers' organization in the AGDPS |

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| | | | | study, this issue will be discussed for the selected types of organization. |
| 46 | **5.2.1 Agricultural ISC and pricing calculation**<br>**ISC calculation modality** | | Why calculating a NPV of water demand? This is not easily understandable and should be justified. The more logical way of calculating the variable part is:<br>Total O&M costs (including OPEX/renewal fund/Water right for basin authority as proposed) / average annual water requirements. | NPV (money over time)/ NPV (Water demand) is the equivalent to mean (money)/mean (volume) but with a provision on the time value of money. |
| 47 | **5.3 Value for money analysis** | The conclusion of this chapter is directly linked to the assumptions made in terms of work delays and water fees recovery | The consultant should justify on which basis these assumptions were made | OK cf answer to comment 34 |
| 48 | **6. Main documents and stages to carry out** | | This chapter should mention the need to recruit a transaction adviser and specify at which stage. Should the negotiation of the WPA be carried out before the transaction adviser is recruited? The consultant should advise on this point too. | Ok. Done.<br>Yes the negotiation of the WPA should start as soon as possible as the condition negotiated with Illovo will impact the final structuration/viability of the Concession.<br>Discussion are ongoing to recruited the team leader of the PPP team as WPA negotiator. This only requires a contract variation with BRLi. An other contract variation can also be proposed for the position of transaction adviser.<br>The same advisor can carry out the WPA negotiation and then support the Public authority during the tendering process. |