African Water Facility
Facilité africaine de l'eau
Mobilising Resources for Water in Africa
Mobiliser des ressources pour l'eau en Afrique

Language: English
Original: English
Distribution: Limited

MALAWI

Shire Valley Irrigation Project Phase I
Project Preparation Activities

APPRAISAL REPORT

This report is made available to staff members to whose work it relates. Any further releases must be authorized by the Director of the AWF

November 2013

African Water Facility I Facilité africaine de l'eau
African Development Bank I Banque africaine de développement
BP 323 - 1002 Tunis Belvédère – Tunisie
Tel: + 216 71 102 197 Fax: + 216 71 348 670
Email : africanwaterfacility@afdb.org
www.africanwaterfacility.org

TABLE of CONTENTS

LIST of ABBREVIATIONS and ACRONYMS

AfDB	African Development Bank
AWF	African Water Facility
CCP&CB	Communications, Community Participation and Capacity Building (Provider)
CMP	Comprehensive Mitigation Plan
DSP	Dam Safety Panel
EIA	Environmental Impact Assessment
EoI	Expression of Interest
ESCOM	Electricity Supply Corporation of Malawi Limited
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GBI	Green Belt Initiative
GoM	Government of Malawi
IDA	International Development Association
IRLADP-AF2	Second Additional Financing for the Irrigation Rural Livelihoods and Agricultural Development Project
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MGDS	Malawi Growth and Development Strategy
MoAFS	Ministry of Agriculture and Food Security
MoWDI	Ministry of Water Development and Irrigation
PIM	Preliminary Information Memorandum
PMP	Pest Management Plan
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
QCBS	Quality and Cost-Based Selection
RAP	Resettlement Action Plan
RFP	Request for Proposal
SCU	Study Coordination Unit
SVIP	Shire Valley Irrigation Project
ToR	Terms of Reference
UNDB	United Nations Development Business
WB	World Bank
WPP	Water Partnership Program

CURRENCY

Local Currency	:	Malawian Kwacha (MWK)
1 Euro (€)	:	446.8 MWK (local exchange rate September 2013)

RESULTS BASED LOGICAL FRAMEWORK ANALYSIS

Country and project name: **Malawi, Shire Valley Irrigation Project Phase I – Project Preparation Activities**
Purpose of the project: Conduct feasibility study and preparatory activities to mobilize resources for investments

RESULTS CHAIN		PERFORMANCE INDICATORS			MEANS OF VERIFICATION	RISKS/MITIGATION MEASURES
		INDICATOR	BASELINE	TARGETS		
IMPACT	Sustainable improvement in agricultural productivity and production leading to economic growth and reduction of rural poverty in the Lower Shire Valley	1. Agriculture GDP growth per annum 2. Prevalence of poverty in the lower Shire	**2012** 1.5% 60% of population live under poverty line and 25% live in extreme poverty	**By 2030:** 6% (CAADP) Incidence of rural poverty reduced by 1.5% per annum over the life of the project	Source: National statistics, Socio-economic and poverty surveys Periodicity: Annual review.	Risk: Inadequate mobilization of funding for capital investments Mitigation Measures: Negotiate with Illovo arrangements to meet its share of capital and O&M costs Provide balanced risk allocation scheme to encourage private sector participation
Outcomes	Bankable projects designed and investments leveraged for the first phase of the project	Extent of financing secured	0 US$ mobilized in 2012	100% of required financing for phase I, pledged by 2015	Source: MoWDI, MoAFS, donors Periodicity: Annual review, PCR	Risks Lack of coordination between studies Mitigation measures SCU reinforced by a project coordinator Risk: Lack of interest and commitment by donors, private sector and prospective PPP partners. Mitigation Measures Hold stakeholder review workshops and private sector outreach events GoM engages prospective financing partners throughout preparation process and at donors' conference.

OUTPUTS	**Component 1: Preparatory Studies**				**Source**: MoWDI, MoAFS, Project Progress Reports, supervision missions and evaluation reports. **Periodicity**: annual	Risk: Inadequate inclusion of poor population and women in the project Mitigation Measures: Develop the project based on successful land tenure practices and transparent choice of beneficiary groups. Develop a communication and gender strategies Risk: Non sustainability of arrangements for O&M Mitigation Measures: Organize farmers in out-growers schemes linked to private sector, enabling them to grow commercial crops. Develop a strategy for strengthening SME's. Risk : Opposition by local community during preparatory activities Mitigation Measures: Preparation activities involving Communication and Community Participation Risks Lack of interest or cooperation from community, donor representatives and other stakeholders. Mitigation Measures Ensuring study ownership by the concerned community and other stakeholders through a fully participatory planning approach. Formation and operationalization of Steering Committee
	1. Communications and gender strategy for the project approved and applied	Availability of documents/studies/committees	Nil	Strategies developed 12 months after approval		
	2. Various tiers of participatory planning committees, established and operational		Nil	Planning committees established 9 months after approval		
	3. Feasibility of the location of the intake site at Kapichira dam validated through a physical model		Nil	15 months after approval		
	4. Digitized large scale topographic map, prepared		Nil	Top. map completed after approval +2 months		
	5. Updated technical feasibility study approved		Nil	26 months after approval		
	6. PPP Feasibility study prepared		Nil	26 months after approval		
	7. Updated ESIA, and ESMP, PMP and RAP prepared and approved		Nil	26 months after approval		
	8. Dam safety panel established			11 months after approval		
	Component 2: Project Management					
	Steering and Consultative Committees and Studies	No of Committees meetings held	0 meetings	5 SC & CC meetings held by mid-2016		
	Coordination Unit (SCU) established and operationalized		No SCU	SCU established approval + 3 months		
	Stakeholders' consultation meetings and donors' conference organized	Number of stakeholders' workshops held	0	30 meetings by month 24 after approval		
		Donors' conference held	0	Donors' conference by mid-2016		

Key activities	**Inputs (euros)**
Component 1: Preparatory studies	4,605,000
Component 2: Project management	202,500
Contingencies	480,750
Total	**5,288,250**

EXECUTIVE SUMMARY

Introduction and Background

Government of Malawi (GoM) has for many years intended to develop irrigated agriculture in the Lower Shire Valley and a number of successive studies and reports were prepared, all of which have failed to lead to the project implementation. The identified gaps included water availability, the optimum site for the intake structure, management of the bulk water and infield irrigation infrastructure, the choice of irrigated crops and marketing, land tenure, cost recovery, sustainability and the role of the private sector.

A joint AfDB/World Bank identification mission was then carried out in January 2011, that determined the scope of the preparatory activities needed to implement the project under a PPP scheme.

The Proposed Project

The development objective of the proposed Shire Valley Irrigation Project (SVIP) is *to improve agricultural productivity and production in a sustainable manner leading to economic growth and reduction of rural poverty in the Lower Shire Valley*, by establishing market-linked smallholder farming ventures and professionally operated irrigation services. The project involves the phased development of 42,500 ha in the Lower Shire Valley, based on abstracting water from the River and conveying it by gravity to the irrigable area mainly through open canals. Phase I of the project would extend to 21,000 ha, of which some 11 000 ha have already been developed by a large-scale commercial farm and 750 ha by outgrowers for irrigated sugar cane, using water pumped directly from the River. These areas would be converted to a gravity water supply, thus saving significant pumping costs (about US$ 5.5 million per year).

The bulk water supply system would be governed by a membership-based apex organization of water users' associations and operated and maintained by a private partner in a PPP arrangement, either as a concession, a lease or as a management contract, depending on the partner's interest in project financing. Smallholder farmers would organize themselves, through a highly participatory planning and development process, into consolidated blocks of irrigable land and commodity-based producer organizations in win-win partnerships with profitable value chains, including the provision of agricultural support services – on similar lines to the EU-assisted Shire Valley Cane Growers' Trust which has developed a sound partnership with Illovo Sugar Limited, the private sector operator of the 11,000 ha estate. Indeed, Illovo's presence is seen as an opportunity for the project: as both a producer and processor the company would be strongly committed to the success of the infrastructure development as well as to smallholder outgrowers on whom they would rely for input for their factory.

The estimated investment cost for Phase I of the project is €231 million (USD299 million) of which Illovo would be expected to contribute a share still to be negotiated. The investment would result in lifting smallholders out of poverty, as well as providing additional opportunities for employment for thousands of other households (272 000 beneficiaries).

Further Preparation Activities Proposed

The objective of the proposed further preparation activities is to provide GoM with a comprehensive set of information required for making a decision regarding the implementation of Phase I of SVIP. The work will include: (a) updating the 2008 feasibility study, taking account of the findings of the recently completed (May 2012) prefeasibility study funded by AWF and recognizing the opportunity presented by the presence in the project area of the private sector sugar estate and factory and (b) undertaking additional work on aspects that have not so far received adequate coverage in the feasibility study.

The activities are expected to last 30 months. The outputs will be as follows:

Output 1: Communications and gender strategy developed and applied.
Output 2: Various tiers of participatory planning committees established and operational.
Output3: Feasibility of the location of the intake site at Kapichira dam validated through a physical model.
Output 4: Digitized large scale topographic maps prepared.
Output 6: Updated technical feasibility study approved.
Output 7: PPP Feasibility study prepared.
Output 8: Updated Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Pest Management Plan (PMP) and relocation Action Plan (RAP) prepared and approved.
Output 9: Dam safety panel established.

The estimated total cost of the activities leading to these outputs is €5.3 million. Of this amount, AWF will provide a grant of €1.79 million to cover the cost of the technical feasibility study. GoM will contribute €73,700 to cover the project management costs and the balance (€3.42 million) will be provided by on-going projects financed by the World Bank.

Recommendation

The project is consistent with the national policies and with AWF strategy. It is relevant regarding the socio-economic development of the Shire Valley, and based on the expected effectiveness and sustainability of SVIP Phase I, it is recommended that AWF provides a grant not exceeding €1,793,000 as a contribution to the proposed preparation activities, specifically for updating the technical feasibility study.

I. BACKGROUND

1.1 Project Rational and Origin

1.1.1 The Government of Malawi has planned to develop irrigation in the Lower Shire Valley since the 1940s, in order to reduce the uncertainties associated with rainfed agriculture. The proposed project is located in the extreme south of Malawi on the right bank of the Shire River within the administrative districts of Chikwawa and Nsanje.

1.1.2 The project has been the subject of a large number of surveys and studies. In 1989, the GoM commissioned a land tenure and land allocation study for a potential large-scale irrigation project in the Shire Valley. This was followed by a detailed design study in 1992. The 1992 detailed design study was updated in 1997 by CODA and Partners, a consulting company, under a TAF/ADF grant. This updated study however failed to present a comprehensive enough account of technical feasibility, social sustainability and economic viability, and the project consequently did not proceed. In 2008, with further financing from the African Development Bank, GoM contracted the same consultancy firm to synthesize and aggregate all outputs from previous studies, formulate an irrigation project and undertake an environmental impact assessment (EIA).

1.1.3 The 2008 study found that it would be feasible to develop an irrigation scheme in the Shire Valley by abstracting irrigation water from Hamilton Rapids, upstream of the irrigable area (Map in Annex 1). A total area of 42 500 ha, of which approximately 30 percent had already been developed using irrigation water pumped directly from the river, would be irrigated by gravity to grow mainly sugarcane, rice, maize, cotton, sorghum, and vegetable crops. Water would be conveyed to the irrigated fields mainly through open canals, and schemes currently using a pumped water supply would convert to gravity, thus saving significant pumping costs (US$ 5.5 million[1]). The study, however, did not demonstrate that water requirements for the various uses (hydropower, water supply and environmental flows in addition to irrigation) would be met, and lacked details on the role of the private sector and issues of land tenure, marketing and viability.

1.1.4 In November 2009, GoM resumed its efforts to finalize preparation of the project and sought AWF assistance to update the existing studies and finalize the project design for implementation. In response, the Bank undertook an identification mission to Malawi in July 2010 to determine the required focus areas of the proposed study update. This was followed by a joint World Bank/AfDB identification mission in January 2011 and an AWF preparation/appraisal mission in March 2012, to which the current report refers. Meanwhile, GoM commissioned two further studies, financed by World Bank, on (a) the options for a Public-Private Partnership (PPP) for the project and (b) the availability of water for irrigation at a point immediately upstream of the existing Kapichira Falls hydropower station (because water availability had become a cause for concern as a result of increased competing demand for water for power generation).

[1] US$ 480/ha according to BRL Ingenierie. 2011. Public Private Partnership Options Study and Awareness Raising for Irrigation Investment in Malawi: Final Report. Ministry of Irrigation and Water Development; Privatization Commission, Lilongwe

1.2 Sector Status and Priorities

1.2.1 Agriculture accounts for more than 80 percent of Malawi's export earnings, contributes more than 40 percent of gross domestic product (GDP) and provides a livelihood for 85 percent of the population. Smallholder farmers contribute about three-quarters of agricultural production with farming systems dominated by a maize-based rainfed cropping system.

1.2.2 The country depends largely on rainfed agriculture to achieve food security and socio-economic growth. Agricultural productivity and production under rainfed conditions is however low and uncertain, in particular owing to unreliable rainfall weather shocks and natural disasters (patterns, erratic rains, dry spells, pest and diseases, droughts, floods and so on). Since Malawi is endowed with underutilized water and irrigable land GoM therefore places a high priority on irrigation development to increase crop productivity and production, for food security[2] as well as value addition for both domestic and export markets.

1.2.3 Recently; GoM had prioritized agriculture as one of the pillars of its *Growth and Development Strategy* (MGDS) and in 2007, with assistance from its development partners, it formulated the *Agriculture Sector Wide Approach Programme* (ASWAp) to provide a reliable and cost-effective route out of chronic food insecurity and dependence on food aid. ASWAp aims at increasing agricultural productivity, improving food and nutrition security, diversifying food production to improve nutrition at household level and increasing agricultural incomes of the rural people. ASWAp constitutes the Investment Plan for Malawi's compact with the *Comprehensive African Agricultural Development Programme* (CAADP), which GoM signed in April 2010.

1.2.4 In 2010, as a part of its ASWAp strategy, GoM launched the *Green Belt Initiative* (GBI), which was designed to increase productivity and production, incomes and food security at both household and national levels, for economic growth and development, by irrigating a million hectares of land in a swathe lying within 20 kilometres of the country's three lakes and 13 perennial rivers. The proposed Shire Valley Irrigation Project (SVIP) would make an important contribution to this initiative. It would enhance agricultural productivity and incomes for smallholder farmers who constitute the majority of the population in the target area. It would also involve the development of irrigation infrastructure to enable smallholders to enter into win-win partnerships with the private sector for the production of industrial and food crops for processing and manufacturing, in line with the Bank's *Country Strategy Paper 2013-2017*, which has as its two pillars improving infrastructure and accelerating private sector development.

1.3 Problem Definition

1.3.1 The Lower Shire Valley, which covers the districts of Chikwawa and Nsanje, experiences prolonged dry spells and frequent flooding. It is, however, one of the most fertile areas in Malawi with rich deep soils suitable for irrigation. With a reliable source of water

[2] In the context of this report 'food security' means the ability to obtain food either from own production or bought in at comparative advantage. The term can be applied to the national, regional or household level.

from the Shire River the area has a high irrigation potential. Yet the majority of the 700 000 people that inhabit the area suffer from food insecurity owing to rainfall uncertainty.

1.3.2 ***Water Availability for the Project:*** The Government commissioned a hydrological study[3] aimed at assessing the water availability for the various uses along the Shire River (hydropower, irrigation, water supply, environmental flows). This study concludes that "the preparation of the SVIP is found feasible, seen from a water availability point of view and the preparation of the implementation of the project should continue". However, data available show that a series of nearly 20 years without outflow from the lake occurred at the beginning of the 20th century (around 1906-1935), due to a conjunction of dry years and sedimentation of a sand bar at the lake outlet. The preparation studies should further investigate the causes of this hydrological event and propose mitigation measures. In addition although the above mentioned study demonstrates that prioritizing irrigation versus hydropower is economically justified, optimization of the water allocation between uses when water is scarce should be further investigated.

1.3.3 ***Project Water Requirements:*** previous estimates of project water requirements have not been consistent between studies. The above mentioned water availability assessment however considers that a peak demand of 37 m3/s (month of September) is the more reliable estimate.

1.3.4 ***Lack of Information to Conduct Feasibility:*** Earlier surveys were not sufficiently intensive for feasibility level planning. For example, topographic and soil maps are either unavailable or insufficient and socio-economic information will need to be updated as the latest surveys were carried out as long ago as 1988. In addition, particular attention would need to be paid to observance of GoM's objectives under the current development plans by thoroughly examining the current status of women and preparing a gender strategy for the proposed project.

1.3.5 ***New Location of the Intake and other technical issues:*** Earlier project designs proposed abstracting water from a site at Hamilton's Rapids. This would have involved routing the Feeder Canal for about 9-10 km through Majete Game Reserve. Given the projected significant impact on the reserve, it has now been decided to consider a site further downstream in the right bank of the reservoir formed by Kapichira Falls Dam, which would involve less of an environmental impact as well as being lower in cost. This would need to be studied in detail, including the impacts on the morphology of the sediment deposits in the reservoir which could negatively impact power generation; physical hydraulic modelling studies would therefore be required. This new intake location option could also have consequences for the safety of the existing dam, making it necessary to appoint a Dam Safety Panel to ensure that any investigations and designs are competently executed and that internationally recognized dam safety procedures are followed from feasibility study onwards. Since the new proposed abstraction point would be from a lower elevation than the originally selected diversion site, this would additionally have implications for the area of land that could be irrigated by gravity. In addition, several critical technical issues were raised by the previous studies, including the exact phasing of the project. This makes it necessary to have a preliminary phase in the feasibility study aimed at providing sufficient analysis to the Ministry of Water Development and Irrigation (MoWDI) to make decisions about these technical options before developing the full feasibility study.

[3] Study on water availability for irrigation and hydropower production on shire river at Kapichira falls; NORPLAN; Final report; April 2013

1.3.6 ***Experience of Malawi with Development and Sustainable O&M of Large Scale Complex Irrigation Schemes:*** The proposed project, if fully developed, would extend to approximately 42 500 ha and would be one of the largest irrigation schemes in the region. At an estimated total capital cost of USD 648 million at 2012 prices[4] it would represent a huge investment for Malawi. Successive studies have therefore assumed that the project would be carried out in two phases of approximately equal size. Nevertheless, the investment costs even for a first phase only (USD298 million) would still be considerable and far beyond Malawi's financing capacity. Indeed, the total financing for Phase I alone would probably require the support of more than one international financing institution. The proposed project will be by far the largest scheme in the country. This will therefore be one of the major challenges to be addressed carefully.

1.3.7 But irrigation development is not merely a matter of 'adding water'. Whether the project is phased or not it would also represent a substantial investment in terms of cost per hectare and cost per beneficiary household. Irrigation water would therefore need to be used for the production of high value crops at commercial estate levels to achieve economic viability and justify these investment costs. It would also need to be profitable at the farm level – otherwise the desired income gains would not be achieved. Its operation and maintenance would need to be self-financing for sustainability. These conditions could only be achieved if effective governance, efficient management and support services, as well as profitable markets, were in place. How these conditions were to be achieved, given the absence of in-country experience with development and operation of large scale irrigation projects, was not adequately dealt with in the previous reports (with the exception of the recent report on PPP options).

1.3.8 ***Role of Private Sector:*** The presence of Illovo Sugar Limited, a private sector sugar estate and factory that occupies about a third of the total area targeted for development, presents a unique opportunity for smallholders to take advantage of a ready market for sugar cane as well as a linkage to support services such as extension and credit (and, indirectly, to research) – as outgrowers on nearly 800 ha have already experienced. Both Illlovo owned sugar cane estate and the outgrowers scheme are already under irrigation through pumping. It would be justifiable to identify a workable formula for participation of these existing estates in the project, possibly through contribution of full capital cost of infrastructure as well as O&M. Nevertheless, it would be prudent to seek other profitable value chains as well, rather than relying on a single commodity – especially one as volatile as sugar – even if it is currently by far the most profitable crop for the area. There would then be a need to identify the most appropriate mechanisms for integrating project farmers into these value chains in a way that would benefit all parties concerned.

1.3.9 The 2011 PPP study[5] compared two options for a PPP arrangement (Concession and affermage or lease) to construct and/or manage the feeder and secondary canals, and recommended "to deepen the analysis of these two options in the PPP feasibility study giving priority to the option of concession if tariff is confirmed to beaffordable for the final users".

1.3.10 ***Land Tenure:*** Non clarity of some aspects of land tenure rules poses another challenge to the development of the proposed project. While Illovo occupies its land on a long lease from Government, most of the remainder of the proposed project area is occupied

[4] Malawi: prefeasibility report on the shire valley irrigation project; AWF; May 2012

[5] Public Private Partnership Options Study and Awareness Raising for Irrigation Investment in Malawi; BRLi, February 2011

and used under a customary tenure system by which the traditional authorities control its allocation. In principle, once customary land is allocated to an individual, the right to its use (but not sale) is handed down from generation to generation. However, under the current legislation[6], land under customary tenure has been treated as a subset of public land, vested in the President, and it has in the past been acquired by the State and allocated to estates without adequate compensation. Insecurity of tenure of customary land is an issue that has been addressed to some extent in the current Land Policy 2002 but so long as the latter remains a statement of intent rather than Law smallholder farmers understandably feel under threat. The issue is all the more sensitive because the project would involve land acquisition to accommodate the irrigation infrastructure. Furthermore, the irrigable area would likely have to be divided up into blocks of land that would become individual schemes within the overall project, and this would almost certainly require land acquisition and reorganization.

1.3.11 It would therefore be necessary to establish the 'rules of engagement and inclusion of the project' that is endorsed by the local communities, their traditional authorities and GoM, and to carry out a fully participatory planning process to ensure that it is implemented effectively and equitably –ensuring that the agreed compensation measures and inclusion measures are adhered to.

1.3.12 ***Environmental and Social Impacts:*** The previous EIA would need to be updated to international standards. An updated Environmental Management Plan and Resettlement Action Plan would need to be prepared as well, subjected to stakeholder review and taken into account in the feasibility level designs. The updated studies would need to examine in particular: (i) the impact of the project on Majete Game Reserve; (ii) Impact on availability of grazing for livestock; (iii) Impact of project on the incidence of water borne disease, (iv) impact of expected increased use of agrochemicals on pollution, and so on.

1.3.13 ***International Waters:*** the Shire River, and its source Lake Malawi, are transboundary water and any consumptive use (e.g. for irrigation) would require a consultation of the riparian states.

1.4 Beneficiaries and Stakeholders

1.4.1 The project would benefit not only the population of the Lower Shire Valley but also Malawi as a whole by contributing to economic growth. The primary beneficiaries of SVIP would comprise smallholders as well as households receiving additional wage employment in irrigation farming. A pre-feasibility study[7] estimates that these households represent about 93000 beneficiaries in phase 1, and 272 000 (total area) in phase 2, or 40% of the lower Shire Valley population (2008).

1.4.2 In addition, Illovo Sugar would also benefit from being able to convert to a gravity water supply (saving about US$ 5.5 million per year), for which it would be expected to meet its share of the infrastructure investment and O&M costs. In the wider arena, the project would create a demand for incremental upstream and downstream economic activities (such as the manufacture and distribution of inputs as well as agro-processing and marketing).

[6] The *Land Act 1965*.

[7] Malawi: prefeasibility report on the shire valley irrigation project; AWF; May 2012

1.4.3 Others with a stake in the project would include the operators of Majete Game Reserve, as well as, possibly, Lengwe National Park, private sector input suppliers and agro-processors, the local authorities (including the traditional authorities), donors, NGOs operating in the area and beyond and, of course, GoM and its district level staff, as well as the riparian states.

1.5 Justification for AWF Intervention

1.5.1 The proposed activities are well aligned with the new strategic framework of the AWF. It falls under the principal strategic priority to "***prepare investment projects"***. It is also consistent with the Bank's Long Term Strategy, which "focus on two objectives to improve the quality of Africa's growth: inclusive growth, and the transition to green growth". Indeed, the project will directly benefit to about 272 000 persons, ensure jobs creation, and improve water and food security.

1.5.2 The project has been stalled for many years as a result of the lack of a comprehensive design. The proposed studies will bring Phase I of the project to a stage at which it can be readily appraised, financed and implemented. They will guide the intervention in the Shire Valley towards enhancing crop productivity, profitability, increased incomes and poverty reduction through providing smallholders with reliable irrigation services and linking them to value chains – for which the existing sugar estate and factory represents a unique opportunity. The output from the studies should enable GoM to mobilize funds from a number of potential partners, in particular the World Bank and the African Development Bank. The private sector, especially Illovo Sugar would also be expected to contribute to project financing to cover its share of the costs.

1.5.3 The World Bank has shown strong interest in financing the project and supporting the preparatory activities. In 2011; the World Bank carried out the following Bank implemented studies: (i) initial water resources assessment (WPP financed); and (ii) the PPP viability assessment (PPIAF financed). Currently; the World Bank supports the prefeasibility level additional water resources assessment and acquisition of aerial photography through the on-going IDA financed Shire River Basin Development Project and the Water Resources Development Program respectively. In addition; the recently approved IDA financed additional financing for the IRLADP has a provision of up to US$4.0 million for support of the preparatory activities of the Shire Valley Irrigation Project. This strong commitment by the African Development Bank and the World Bank for the project signals its significant viability and the high likelihood that the AWF support for the SVIP's preparatory activities would result in leveraging significant investments for the implementation of that project. The leverage effect of the AWF funding could reach around 1 to 165[8] (.

[8] Grant amount divided by funds leveraged for the investment = 1.8/298 = 1/165

II. THE ACTIVITIES

2.1 Goal, Impacts, Objectives and Outcomes

2.1.1 The expected impacts are to achieve sustainable improvement in agricultural productivity and production leading to economic growth and a reduction of rural poverty in the Lower Shire Valley.

2.1.2 The purpose is to carryout feasibility study and irrigation project preparation, building on earlier studies and efforts, integrating private sector role in project design, and undertaking additional work aspects that have not so far received adequate coverage.

2.1.3 The outcome is "Bankable projects designed and investments leveraged for the first phase of the project". A well prepared set of documentation is expected to enable the Government not only to proceed to appraisal but also to mobilize resources for implementation – from more than one development partner as necessary.

2.2 Project Components, Outputs and Activities

2.2.1 The project will have two main components:

(i) Preparatory Studies;
(ii) Project management.

2.2.2 The main outputs, expected from preparatory studies component, will be as follows:

Output 1: Communications and gender strategy developed and applied.
Output 2: Various tiers of participatory planning committees established and operationalized from village to traditional authority and district, in both Phase I and II areas, for participation in the planning process.
Output 3: Feasibility of the location of the intake site at Kapichira dam validated through a physical model.
Output 4: Digitized large scale topographic mapping of the project area prepared.
Output 5: Updated technical feasibility study approved.
Output 6: PPP Feasibility study prepared and approved.
Output 7: Updated Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Pest Management Plan (PMP) and relocation Action Plan (RAP) prepared and approved.
Output 9: Dam Safety Panel established.

2.2.3 ***Outputs from Coordination of the Preparatory Activities Component:*** Given the large and interactive nature of the preparatory activities as well as the complexity of issues at hand that requires involvement of large and diverse groups of stakeholders during the project preparation, it is crucial that proper coordination is in place. This component will be concerned with: (i) formation and operationalization of a Project Steering Committee (PSC), a Project Consultative Committee (PCC) and Preparatory Studies Coordination Unit (PSCU); (ii) holding stakeholders' workshops and donors' conference; and (iii) completion of

preparatory studies and coordinating the activities in a manner that ensures successful completion.

2.2.4 Achieving the above objectives will require a series of activities to be carried out to deliver the outputs that will lead to the results (outcomes and impacts) desired. For technical reasons, as well as for ease of procurement and management, these activities will be grouped as follows:

- *Activity Group A*: This would include preliminary activities that will start prior to the bulk of the activities start-up through support from the on-going IDA projects:
  (i) Study on water available at Kapichira for SVIP, which is financed by the Shire River Basin Development Project (completed); and,
  (ii) Carrying out aerial photography for the proposed project areas; which is supported by the on-going Water Resources Development Program (financed by IDA as well);
- *Activity Group B:* Communications, community participation and capacity building, gender strategy as well as development of linkages with the private sector.
- *Activity Group C:* Hydraulic modelling of the proposed intake site upstream of Kapichira dam to ensure that the proposed intake will not jeopardize the safety of the existing dam.
- *Activity Group D:* Technical feasibility.
- *Activity Group E:* ESIA/ESMP/PMP/RAP.
- *Activity Group F:* PPP Feasibility study.
- *Activity Group G:* Dam Safety Panel.
- *Activity Group H:* Study Coordination, stakeholders' workshops and donors' conference

2.2.5 With the exception of Groups G and H, all the above groups of activities will be contracted out to consulting companies/contractors (or, in the case of Group B, a single NGO). Group G services (the Dam Safety Panel) will be provided by individual consultants. The reasoning behind separating Groups B, C, D and E from each other is as follows:

- Group B needs to be carried out independently of Group C because the consultants for the former will need to appear as 'honest brokers' between the communities and the Group C engineers and planners;
- Similarly, the Group E consultants need to be independent of the Group D consultants so that conflict of interest is avoided as they assess environmental and social impacts; and
- Group F needs to be kept separate from Group D to avoid a situation in which the Transaction Adviser directs the technical studies without necessarily being competent to do so.

2.2.6 The section below provides a summary of the activities (Detailed terms of reference for the Feasibility study, funded by the AWF are provided in Annex 5). As a matter of principle the various activities will focus on Phase I and will only be extended to Phase II if the information generated might affect the design or viability of Phase I (e.g. demarcating the potential irrigable land in Phase I so that the Feeder Canal may be designed to ultimately serve both phases) and the marginal cost of doing so is small. The intention here is to avoid carrying out any activities that can be left until it is known whether or not Phase II will proceed, to reduce the risk of the activity outputs becoming stale or even lost over time.

2.2.7 ***Preliminary Activities - Activity Group A:*** This includes two studies that started prior to the bulk of the preparatory activities. Both studies are supported by the World Bank through on-going IDA financed projects in Malawi:

2.2.8 ***Study on Water Availability at Kapichira – Pre-feasibility Level Study:*** This study is completed and its conclusions are presented in § 1.3.2.

2.2.9 ***Aerial Photography and orthophotomaps:*** Acquisition of aerial photography, and development of orthophotomaps for the whole project area should be completed by end 2013. The activity is supported by the IDA financed, Water Resources Development Program.

2.2.10 ***Activity Group B: Communications, Community Participation and Agricultural Development (CCP&AD-18 months) (financed by IRLADP-AF):*** A Communications, Community Participation and Capacity Building Provider (CCP&CB Provider) will be contracted at the beginning of the studies to carry out the crucial task of facilitating the project. The CCP&CB Provider will, in particular:

- prepare and implement a communications strategy, for use in maintaining a constant flow of up-to-date information on project decisions and developments that will be targeted principally to the affected communities but also to the wider public, in the vernacular where appropriate;
- prepare a grievance redress mechanism;
- prepare a gender strategy for the project, for implementation during the remainder of the studies and thereafter. The strategy will aim at ensuring that women are included in a fair manner among project beneficiaries;
- organise the participation/consultation process for the design of the scheme with the support of the Consultant in charge of the Feasibility Study;
- facilitate all interactions between the communities, their planning committees, MoAFS, MoWDI, the Feasibility Study Consultant, the PPP feasibility Consultant/Interim Transaction Adviser, value chains and other concerned partie;
- develop a land consolidation and resettlement framework;
- carry out an analysis of existing and potential value chains for smallholder farmers/smallholder organizations and identify agribusiness ventures and potential win-win partnerships in value chains other than sugar cane;
- taking account of the knowledge gained propose an appropriate and equitable mechanism for integrating Illovo into the project to benefit an increased number of project area smallholder farmers in win-win partnerships for not only marketing but also for the provision of support services such as extension, credit, input supply .

2.2.11 ***Activity Group C: Hydraulic Modelling of the newly proposed intake location (8 months) (financed by IRLADP-AF):*** This activity group will be required to examine the impacts of the new location upstream of the Kapichira dam on the safety and integrity of that structure as well as on the sedimentation in the reservoir.

2.2.12 ***Activity Group D: Technical Feasibility Study (18 months)(financed by AWF):*** This activity group will be required to update the previous technical studies of the proposed project, and provide sound analysis to support the decision making process. Throughout its work, the consultant will be guided by the gender strategy, and will be working closely with the service provider, recruited under activity group B. The Feasibility Study will be carried out in two stages:

Stage 1: assessment of options, negotiation with Illovo Estate, and water balance optimization

The Consultant shall:

- carry out preliminary investigations (soil maps, topography, hydrogeology, flood extension mapping, socio-economics surveys mainly) and develop the Geographical Information System (GIS) that will be used all along the study and beyond;
- assess through a multi-criteria analysis all options requesting a decision from the MoWDI before development of the full feasibility study (with/without Illovo, feeder canal lining, irrigable areas, maintaining or not the existing pumps, etc.);
- provide support to the Transaction Advisor in assessing the interest of Illovo to financially participate in the project;
- refine the water requirements for SVIP: on the basis of the most promising cropping patterns, prepare estimates of farm and project level irrigation requirements for the different irrigation technologies to be employed and levels of efficiency that are likely to be achieved by estates and smallholders, for both Phase I and Phase II;
- quantify the impact of climate change on the irrigation water requirements as well as on the water balance of the river basin;
- study the optimization of the water allocations between the various uses; propose the best trade-off between hydropower and irrigation.

Stage 2: Feasibility Study

The Consultant shall:

- undertake detailed topographical and geotechnical surveys;
- assess the options for location and design of the proposed intake at Kapichira Falls based on the results of hydraulic modelling and geotechnical investigations, for two scenarios: i.e. (a) to serve Phase I only and (b) to serve Phase I and, eventually Phase II;
- adapt the scheme to environmental and socio-economic constraints (crossing of Majete Wildlife Reserve and Lengwe National Park, environmental, grazing and urbanisation reserves, health impacts mitigation measures, etc.); cooperate with the Consultant contracted to carry out the environmental and social impact assessment (ESIA) and ensure that the feasibility level project designs comply in every respect with its recommendations;
- develop the preliminary design for the bulk water supply system and on-farm works for Phase I only in a participatory manner: with the participation of the various tiers of planning committees, carry out a step by step approach to identify schemes, irrigation blocks, distribution systems, for Phase I only;
- assess the carbon finance potential of the project;
- prepare a water supply and sanitation master plan for the communities of the project area (accompanying measure);
- develop the costing and the economic and financial assessment of the project;

- carry out a participatory assessment of various options for governance of the overall system and propose a detailed institutional framework for the management of the scheme; undertake a price setting analysis for each organisational level (Water Users Associations, Illovo, Apex Organisation);

2.2.13 ***Activity Group D: Environmental studies (12 months)(financed by IRLADP-AF):*** This activity group will be required to update and augment the EIA carried out 2008 by carrying out an independent environmental and social impact assessment (ESIA) and preparing (a) an Environmental Management Plan (ESMP/EMP), including a Pest Management Plan (PMP), and (b) a Resettlement Action Plan (RAP). The work of the consultant will be guided by the gender strategy developed under activity group B.

2.2.14 ***Activity Group E: PPP Feasibility study (10 months) (financed by IRLADP-AF):*** An Interim Transaction Adviser will be appointed carry out a PPP Feasibility Study. The Interim Adviser will therefore:

- with the support of the Feasibility Study Consultant, assess various scenarios of participation of Illovo in the financing of the project; support the MoWDI in negotiating Illovo's participation;
- carry out in-depth studies on the PPP options for the bulk water supply recommended in the BRL 2011 report, i.e. (a) a concession and (b) a lease or *affermage*, as well as on a third option of a management contract, using updated data on costs and benefits provided by the Feasibility Study Consultant;
- on the basis of the above, recommend the most favourable, practicable option for SVIP taking account of GoM's objectives for (a) PPPs and (b) the project.
- identify the main risks, propose their allocation to the public or private party and recommend mitigation measures;
- prepare a financial model of the PPP for the selected option, and estimate the price of bulk water;
- structure the financing of the PPP so that the price of bulk water be affordable for the users; recommend the best solution to cover the tariff gap;
- assess the various options for structuring the Special Purpose Vehicle (SPV);
- prepare a preliminary information memorandum (PIM) for the project on the basis of the results of these studies;
- organize outreach events in Malawi and elsewhere in the region to gauge interest in a PPP on irrigation service provision for the project;
- based on the above mentioned analysis, assess the PPP feasibility.

2.2.15 Activity Group F: Dam Safety Panel (financed by IRLADP-AF): Although the project would not involve the construction of a new dam it would depend on the existing Kapichira Dam, which is classified as a large dam, for its irrigation water supplies. The intake for SVIP would probably be located in the right bank of the head pond formed by the dam and if not carefully designed it could adversely affect the safety of the dam. The establishment of a Dam Safety Panel is normally a requirement for appraisal and this is likely to be the case for SVIP, since the Panel will need to be in place in time to influence the detailed designs. The Panel will therefore be appointed during the studies and will review the consultant's draft technical feasibility study report with regard to its proposed intake arrangements.

2.2.16 Activity Group G: Coordination, Stakeholders' Workshops, and Donors' Conference (GoM local funding; IRLADP-AF): All studies will be carried out as participatory process involving all stakeholders. The consultants will therefore be expected to participate in a public consultation programme, facilitated by the CCP&AD Provider. The workshops will be carried out under the auspices of MoAFS and MoWDI and will involve all stakeholders, including the traditional authorities, the private sector and all other affected people (including stakeholders for Phase II). The intention will be to inform all stakeholders about the proposed investment and to ensure that all concerns are adequately addressed in the studies and reports. The consultants will be required to prepare comprehensive but readily understandable presentations of the results of the work at each event, with summaries in the vernacular.

Early in the project preparation process, the Executing Agency will engage with the Donors and invite them to specific meetings. Shortly after completion of the studies MoAFS and MoWDI will organize a donors' conference in either Lilongwe or Blantyre at which a synthesis of the various consultant reports will be presented, with a view to attracting finance for the project.

2.3 Costs and Financing

2.3.1 The total cost of the SVIP preparatory studies is estimated at €5,288,250 broken down as shown in Table 2.1. This represents 2.3 percent of the total investment cost for Phase I of the project. The financing plan, shown in Table 1, includes AWF grant of €1,793,000 that will be made available to cover the cost of the technical feasibility study while the remaining studies and coordination workshops and conferences will be financed by on-going World Bank funded water sector projects in Malawi that are currently under implementation in the amount €3,421,550 in addition to other support for the preliminary activities. The GoM monetary contribution will amount to € 73 700 for the supply of vehicles, their running costs, office equipment and other operating expenditures relating to the coordination of the studies. Detailed cost estimates are presented in Annex 4. In addition, the Government shall also provide as in-kind contribution office space for the consultants and salaries of the project team that will take-over when the IRLADP team will phase out.

Table 2.1: Project Cost Estimates by Component and Foreign/Local Amounts (Euros)

Description	Financing Plan (Euro)							Estimated Total		
	AWF			World Bank Funded Projects			GoM			
	Foreign	Local	Total	Foreign	Local	Total		Foreign	Local	Total
Preliminary Activities[5]										
Water availability study (ongoing World Bank-funded)[3][4]				150 000	-	150 000	-	150 000	-	150 000
Aerial photography[2][4]				250 000	-	250 000	-	250 000	-	250 000
Core Activities[6]										
Component 1: Preparatory Studies	***1 015 000***	***615 000***	***1 630 000***	***2 105 250***	***869 750***	***2 975 000***	-	***3 120 250***	***1 484 750***	***4 605 000***
Communications, community participation & capacity building (incl gender strategy)[1]				750 000	550 000	1 300 000	-	750 000	550 000	1 300 000
Hydraulic modelling of intake site[1]				200 000	-	200 000	-	200 000	-	200 000
Technical feasibility study (incl socio-economic survey, cadastral survey, GIS, value chain analysis)	1 015 000	615 000	1 630 000				-	1 015 000	615 000	1 630 000
ESIA/EMP/PMP/RAP[1]				697 000	185 000	882 000	-	697 000	185 000	882 000
PPP feasibility study & outreach events [1]				433 250	134 750	568 000	-	433 250	134 750	568 000
Dam Safety Panel[1]				25 000	-	25 000	-	25 000	-	25 000
Component 2: Project Coordination				-	***135 500***	***135 500***	***67 000***	-	***202 500***	***202 500***
Total Base Cost (Core Activities)	**1 015 000**	**615 000**	**1 630 000**	**2 105 250**	**1 005 250**	**3 110 500**	**67 000**	**3 120 250**	**1 687 250**	**4 807 500**
Contigencies (10%)	101 500	61 500	163 000	210 525	100 525	311 050	6 700	312 025	168 725	480 750
Total Project Cost (Core Studies)	**1 116 500**	**676 500**	**1 793 000**	**2 315 775**	**1 105 775**	**3 421 550**	**73 700**	**3 432 275**	**1 855 975**	**5 288 250**
Percentage of Total	21.1%	12.8%	33.9%	43.8%	20.9%	**64.7%**	**1.4%**	**64.9%**	**35.1%**	**100.0%**

[1] Will be financed by IDA funded IRLADP-AF

[2] Financed by IDA funded Water Resources Development Program

[3] Financed by IDA funded Shire River Basin Management Programme

[4] Not included in total project cost

[5] Activities are under implementation or completed

[6] Activities not yet started

Table 2.2: Project Cost by Category of Expenditure and Sources of Financing (Euros)

Item	Funded by	Amount €	Procurement mode
Goods		**49 300**	
	Government of Malawi	29 800	Government's procedures
	World Bank	19 500	World Bank's Procedures
Operating Costs		**40 700**	
	Government of Malawi	37 200	Government's procedures
	World Bank	3 500	World Bank's Procedures
Services		**4 717 500**	
Feasibility study	AWF	1 630 000	Quality Cost Based Selection
Other consultancies	World Bank	3 047 000	World Bank's Procedures
Workshops and Conferences	World Bank	40 500	World Bank's Procedures
Contingencies		**480 750**	
Grand total		**5 288 250**	

III. PROJECT IMPLEMENTATION

3.1 Recipient and Executing Agency

3.1.1 The Recipient of the AWF grant for the studies will be the Government of Malawi, represented by the Ministry of Finance. The Executing Agency for the studies will be the Ministry of Water Development and Irrigation (MoWDI) through its Department of Irrigation in close collaboration with the Ministry of Agriculture and Food Security (MoAFS). The studies will be executed within the existing institutional structures of MoWDI which will also be responsible for the procurement of goods and consulting services. It is considered that the Ministry's resources, capacity, expertise and experience are adequate to carry out the technical management of the project.

3.2 Implementation Arrangements

3.2.1 A Study Coordination Unit (SCU) from within the Irrigation Department of the MoWDI will be responsible for the day to day implementation and coordination of the studies. This SCU will be composed of: (i) a full time Project Coordinator, individual consultant, acceptable to the AfDB, (ii) part time staff from the project team responsible for the implementation of the World Bank funded Irrigation Rural Livelihoods and Agricultural Development Project (accountant, procurement officer, irrigation engineer and safeguard specialist) until the project phasing out. The Government will nominate/recruit officers acceptable to the AfDB after the project completion to take over from the IRLAD Team. This SCU might be supported by a team of consultant (World Bank funded). The scope of work and estimate of this consultancy are still under discussion with the World Bank, and its cost is not included in the above presented project budget.

3.2.2 A Steering Committee, chaired by MoAFS and MoWDI, and composed of representatives of the relevant institutions, will be in charge of validating the studies and arbitrating between the technical options studied by the Consultants.

3.2.3 A Consultative Committee, chaired by the Chairman of the Steering Committee, and gathering representatives from all stakeholders (including the private sector) will be in charge of advising the Steering Committee, and shall be consulted all along the project.

3.2.4 The technical secretariat of these Committees will be ensured by the SCU.

3.3 Implementation Schedule

3.3.1 The project duration shall be 30 months, provided procurement processes are anticipated. The feasibility study and the CCP&AD services should be carried out in parallel. The hydraulic model should be contracted a month after the feasibility study, since the results of the model will be used for the preliminary design. The Transaction Adviser should be participating in the negotiation with Illovo expected at the end of stage 1 of the Feasibility Study, and therefore, shall be contracted no more than three months after the technical consultant. The Environmental studies shall last one year, and shall begin 6 months after the feasibility study. Annex 2 shows the detail of the project schedule. Table 3.1 below presents the performance management plan.

Table 3.1: Performance management plan

	Events	Timing from project approval
1	Satisfaction of condition to first disbursement	M0+3
2	Feasibility study and CCP&AD services contracted	M0+6
3	Hydraulic model lab. contracted	M0+7
4	Transaction Adviser contracted	M0+9
5	Environmental Consultant contracted	M0+12
6	Dam safety panel appointed	M0+13
7	Decisions made regarding options assessed during stage 1 of the feasibility study	M0+14
8	Final report of the Feasibility Study and CCP&AD providers approved	M0+24
9	Final decision of the steering committee	M0+26
10	Project completion report	M0+30

3.4 Procurement Arrangements

3.4.1 The procurement of the AWF-financed technical feasibility study will be in accordance with AWF's *Operational Procedures*, the AfDB's *Rules and Procedures for the Use of Consultants* and using the relevant Bank Request for Proposals documents. Procurement arrangements for all procurements to be financed by the AWF, the World Bank and GoM are divided into categories and summarized in Table 3.2, based on the cost estimate details given in Annex 4. Procurements financed from the World Bank projects will follow the existing project agreements between the World Bank and the GoM.

3.4.2 *Goods and Running Costs:* All Goods and operating costs (vehicles, furniture, internet access, offices – including the offices for the consultant, etc.) will be covered by Government of Malawi, for a total amount of € 67,000. Procurements will be made accordingly to Government's procedures.

3.4.3 *Consultancy Services:* The AWF funding will be used to procure one consultancy contract. This procurement will be through competition following the quality- and cost-based selection (QCBS) method. The estimated cost of that contract is € 1.630,000 million. Six other consultancy contracts, financed by on-going World Bank funded projects will be procured as well, using the procedures agreed between the World Bank and the Government. The total estimated aggregate amount of these contracts is US$2,950,000 million.

Table3.2: Procurement Arrangements (all amounts in Euro)

Description	AWF Portion QCBS	World Bank Procedures	Government procedures	Total
SERVICES:	**1 630 000**	**3 087 500**		**4 717 500**
Consulting firms	1 630 000	2 950 000		**4 580 000**
Individual Consultants		97 000		**97 000**
Workshops and Conferences		40 500		**40 500**
GOODS		**23 000**	**29 800**	**52 800**
Vehicles			27 500	**27 500**
Office/IT Equipment/Reports		23 000	2 300	**25 300**
OPERATING EXPENDITURE			**37 200**	**37 200**
TOTAL WITHOUT CONTINGENCIES	**1 630 000**	**3 110 500**	**67 000**	**4 807 500**
CONTINGENCIES				**480 750**
TOTAL				**5 288 250**

QCBS = Quality and Cost Based Selection; IC = Individual Consultants Selection Procedures.

3.4.4 The project will need services of small number of short term consultants to serve in the Dam Safety Panel as well as for the position of project coordinator. These consultancies will be supported by on-going World Bank funded projects and will be procured according to existing project agreements between the GoM and the World Bank. The total estimated aggregate amount of these consultancies is US$ 97,000.

3.4.5 In order to meet the schedule of the project, advance procurement will be required for the AWF supported consultancy contract. This will be needed as the procurement of consultancies that will be funded from on-going World Bank projects can start immediately.

3.4.6 *Workshops / Donors' Conference:* costs related to the consultation process for an amount of €40,500 will be financed by the World Bank, and procurement modalities will be carried out following existing project agreements.

3.4.9 *Assessment of the Executing Agencies:* The Executing Agency, MoWDI, will be responsible for the procurement of goods and consulting services. MoWDI has implemented four ADB funded projects since 2000, is currently in charge of the Songwe River Development Plan (AWF funded), and is therefore used to ADB procedures. The resources, capacity, expertise and experience of MoWDI are considered adequate to carry out the procurement activities. This is based on its performance in the implementation of other AfDB and World Bank financed projects.

3.4.10 *General Procurement Notice:* The text of a General Procurement Notice (GPN) and a Request for Expression of Interest (REI) will be agreed with the MoWDI and will be issued for publication in UN Development Business online, on the Bank's web site, and on local newspapers.

3.4.11 *Procurement plan:* The Executing Agency shall prepare and submit to both the AWF and the World Bank a Procurement Plan that includes all procurements envisioned to take place as part of the preparatory studies. The Procurement Plan will cover an initial period of at least 18 months. The Grant Recipient will update the Procurement Plan on an annual basis or as needed always covering the next 18 months period of project implementation. Any revisions proposed to the Procurement Plan will be submitted to the AfDB's prior no objection. The Grant Recipient shall implement the Procurement Plan in the manner in which it has been agreed with the Bank. Procurement planning arrangements for contracts supported by World Bank's financed projects will be subject to the respective legal agreements between the GoM and the World Bank.

3.4.12 *Prior Review:* Terms of References for all consultancy assignments, whether financed by the AWF or the World Bank projects, are subject to prior review by both the AWF and the World Bank. The following documents are subject to review and approval by the AWF before promulgation, under prior review: the Specific Procurement Notice (SPN); the shortlisting report; the request for proposals; the technical evaluation report; the final evaluation report, including recommendations for contract award, as well as the draft contract. World Bank projects supported contracts for goods and services will be subject to the procurement arrangements, stipulated in the respective agreements.

3.4.13 *Post review:* No procurement of goods or services subject to post-review by the AWF is envisaged under this project.

3.5 Disbursement Arrangements and Expenditure Schedule

3.5.1 The disbursement method for AWF financed contract will be the Direct Payment to the consulting firms recruited for the implementation of the studies, in accordance with the terms of the contract signed with the firm. For contracts, financed by World Bank supported projects, disbursement arrangements, stipulated in the respective project agreements, will be used.

3.6 Financial Management Arrangements

3.6.1 MoWDI will be responsible for the financial management of the project. A Financial Management (FM) Assessment on the Executing Agency was conducted (in August 2012) by the Bank during the appraisal of the Smallholder Irrigation and Value Addition project. A review of the FM Assessment report reflects that the FM environment was found satisfactory.

3.6.2 Since the year 2000, four AfDB projects were completed. The Ministry has proven financial management procedures and adequate experience in managing donors' financed projects' funds, acquired through the successful implementation of the AfDB's, World Bank's, and other donors' portfolios in Malawi. The SCU will include an accountant who is experienced in Donors' financed projects.

3.6.3 The accountant in MoWDI will maintain an accounting system and books of account specifically for the project. The accountant will maintain the accounts and prepare periodic financial statements in accordance with AWF/AfDB procedures. These statements will be submitted to AWF together with the quarterly progress reports.

3.6.4 AWF will recruit and retain an independent auditor to perform a final audit of the financial statements and ex-post procurement review of the contracts financed by AWF funding. AWF will cover the audit costs which will not be deducted from the Grant. The responsibility for preparing the financial statement is with the grant recipient. The audit might be performed on annual basis in case the need arises.

3.6.5 Financial management and audit arrangements for funds from World Bank financed projects will be subject to the arrangements, stipulated in the respective project agreements.

3.7 Monitoring and Reporting Arrangements

3.7.1 Consulting firms will prepare and submit quarterly progress reports in a format to be agreed with the SCU, taking into consideration the information needs of all stakeholders. The reports will cover progress made in comparison to planned actions and indicate proposed corrective action to address deviations.

3.7.2 The Recipient will, based on the quarterly reports and on other relevant data sources, submit quarterly progress reports to the AWF and the World Bank for the whole range of activities, including those supported by on-going World Bank funded projects, in a form to be agreed with the AWF and the World Bank. The reports will cover progress in the implementation of procurements and all other activities of the studies including financial aspects. Any problems encountered will be presented and planned measures to address them explained. The Reports will clearly indicate the level of attainment of the results shown in the Logical Framework Analysis matrix for the reporting period concerned.

3.7.3 In addition the Executing Agency shall ensure the visibility of the AWF funding in accordance with specifications detailed in annex 6 - "communication and AWF visibility guidelines".

IV. EFFECTIVENESS, SUSTAINABILITY, RISKS

4.1 Effectiveness and Efficiency

4.1.1 Developing irrigated agriculture in the Lower Shire Valley had been a consideration of the GoM since the 1940's in order to overcome erratic rainfall patterns and pre-longed dry season. The economy of Malawi is highly dependent on agriculture. Investing in the agricultural sector in Malawi and particularly in irrigation is a sound intervention, given the nature of the country's economy and concentration of the poor in the rural areas. The project would lead to the desired impacts of rural poverty reduction, food security, improving rural incomes through switching from subsistence rain-fed farming to irrigated high value agriculture.

4.1.2 The studies are building on earlier efforts in the sector and the project areas. Procurement of the required consulting services by QCBS following bids from shortlisted

firms only should provide a degree of assurance of competence in the delivery of high-quality outputs from the studies. Furthermore, the experience and capacity of MoAFS and MoWDI will provide further assurance that the studies will be carried out effectively and efficiently. Providing for effective stakeholder participation in the studies will enhance the prospects for optimum results from the studies. The use of an existing team within MoAFS and MoWDI, which is funded by other donors, also improves the efficiency of the preparatory studies due to the reduction in the human resources to be mobilized and the associated costs.

4.2 Viability

4.2.1 SVIP Phase I is expected to bring significant benefits to the rural poor of Chikwawa District and possibly Nsanje District as well as the country as a whole. These will include: (a) enhanced incomes and food security through increased agricultural productivity and profitability and (b) an increase in the contribution of agriculture to economic growth. The May 2012 Prefeasibility Report indicated that the prospects for viability of SVIP were good. However, the proposed studies are designed for a thorough investigation of viability of the project.

4.3 Sustainability

4.3.1 The proposed studies have all been specifically designed to directly address the long-term financial, physical and social sustainability of the proposed project. The technical feasibility study will focus on detailed analysis of the recurrent costs, crop budgets, farm models and farm level profitability, while the PPP feasibility study will focus on designing a self-financing but affordable system for bulk water delivery by a private operator. The proposed gravity water supply, compared with the existing pumped arrangements, would further enhance the prospects for physical sustainability. But perhaps more than anything else the intention is that the project would be driven by smallholders' engagement with profitable value chains in win-win partnerships with the private sector and NGOs, through which they would also obtain sustainable support services such as extension and credit, as well as efficient markets for produce.

4.4 Risks and Mitigation

4.4.1 The large number of interacting activities would require effective coordination on the side of the Government of Malawi. Delays in procurement of one the planned procurements could have adverse impacts on the rest of the activities. In particular; the delay of the recruitment of the CCP&CB service provider could negatively impact other related studies. However; the nature of activities, the required conflicting profiles of consultants / service providers leaves little flexibility with regard to how the packaging could be made. This risk will be mitigated through ensuring that a strong team will be in place in the SCU, including a full time project coordinator. Finally, close follow up by the field offices of the AfDB and the World Bank in Lilongwe especially during the crucial start-up period would ensure timely implementation and recruitment of the consultants.

4.4.2 The Mobilization of the Private Sector to fund the Capital Expenditures is crucial for the success of the project. To mitigate the risk of inadequate involvement of the Private Sector, the Transaction Advisor will propose a balanced risk allocation scheme, organize

outreach events in the region to gauge interest in a PPP, and together with the Consultant in charge of the Feasibility Study, assist MoWDI in negotiating Illovo's participation.

4.4.3 The validity of a number of explicit and implicit assumptions linking the lower to the higher objectives of the studies will determine the level of attainment of its overall objective. At the output level, a lack of interest or poor cooperation by the beneficiary communities is a major risk. The issue of security of land tenure could contribute to negative attitudes towards both the studies and, ultimately, the project. These risks will be mitigated by: (a) a participatory planning process that will be facilitated by a contracted service provider, who will also provide training and capacity building for the communities and their traditional leadership to empower them to participate effectively; (b) by participatory preparation of a Resettlement Action Plan, which the local authorities and GoM would be expected to endorse and uphold and (c) by a series of stakeholder workshops that will be held at each of the key decision points.

4.4.4 Bearing in mind the history of the project and whatever the result of the studies, there would be a risk that funding for the project would be inadequate or delayed – meaning that the studies will have failed to achieve their objectives. This risk will be mitigated through a donor conference to be organized to share a synthesis the various reports on completion of the various studies. In addition the SCU will engage with donors early in the project preparation stage to ensure their views are taken into account in the infrastructure design.

v. CONCLUSIONS AND RECOMMENDATIONS

5.1 The proposed SVIP Phase I would directly benefit nearly 90 000 people in the Shire Valley and many more indirectly beyond the project area. It would therefore make a major contribution to GoM's poverty reduction and growth objectives. It would also be in line with the Bank's *Long Term Strategy*, which focuses on Green and Inclusive Growth, its Country Strategy Paper 2013-2017 which has as its two pillars "improving infrastructure" and "accelerating Private Sector development" as well as with the first pillar of the AWF 2012-2016 Strategic Plan (project preparation).

5.2 However, although the recently completed prefeasibility study indicated that the prospects for the viability and sustainability of the project were good it also found that there were still a number of issues that needed to be addressed in a credible update of the previous studies and project design. The proposed studies are intended to address these issues, attract interest in providing the necessary funding and permit the project to proceed to appraisal and implementation.

5.3 On the basis of this appraisal of the funding request, in terms of its relevance, effectiveness and sustainability, as well as the Recipient's implementation capacity, a Grant of €1.793,000 is hereby recommended to finance the technical feasibility study. Others studies are funded by the World Bank.

5.4 The appointment of a Project Coordinator acceptable to the Bank will be a condition precedent to the first disbursement.

Annex 1: Location Map and Tentative Schematic of the Project

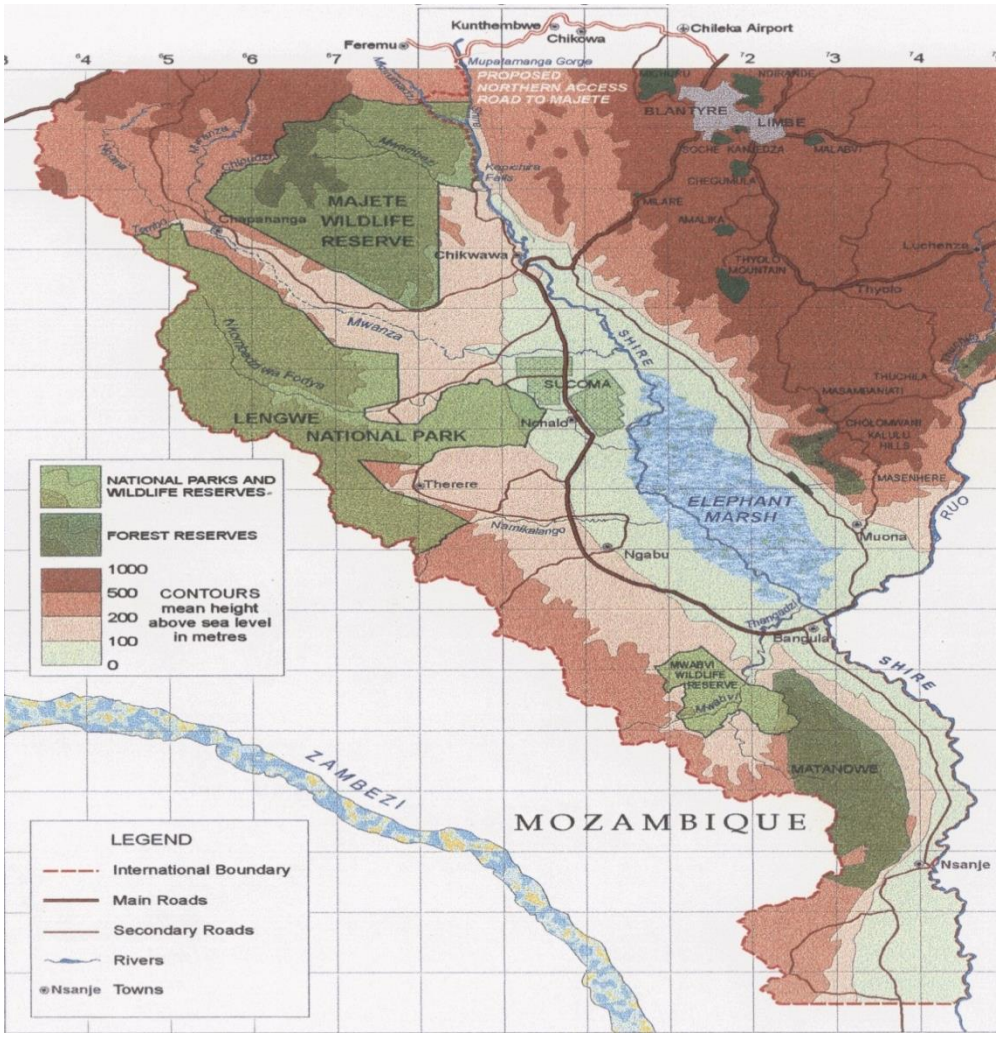


Figure 1. Project Location

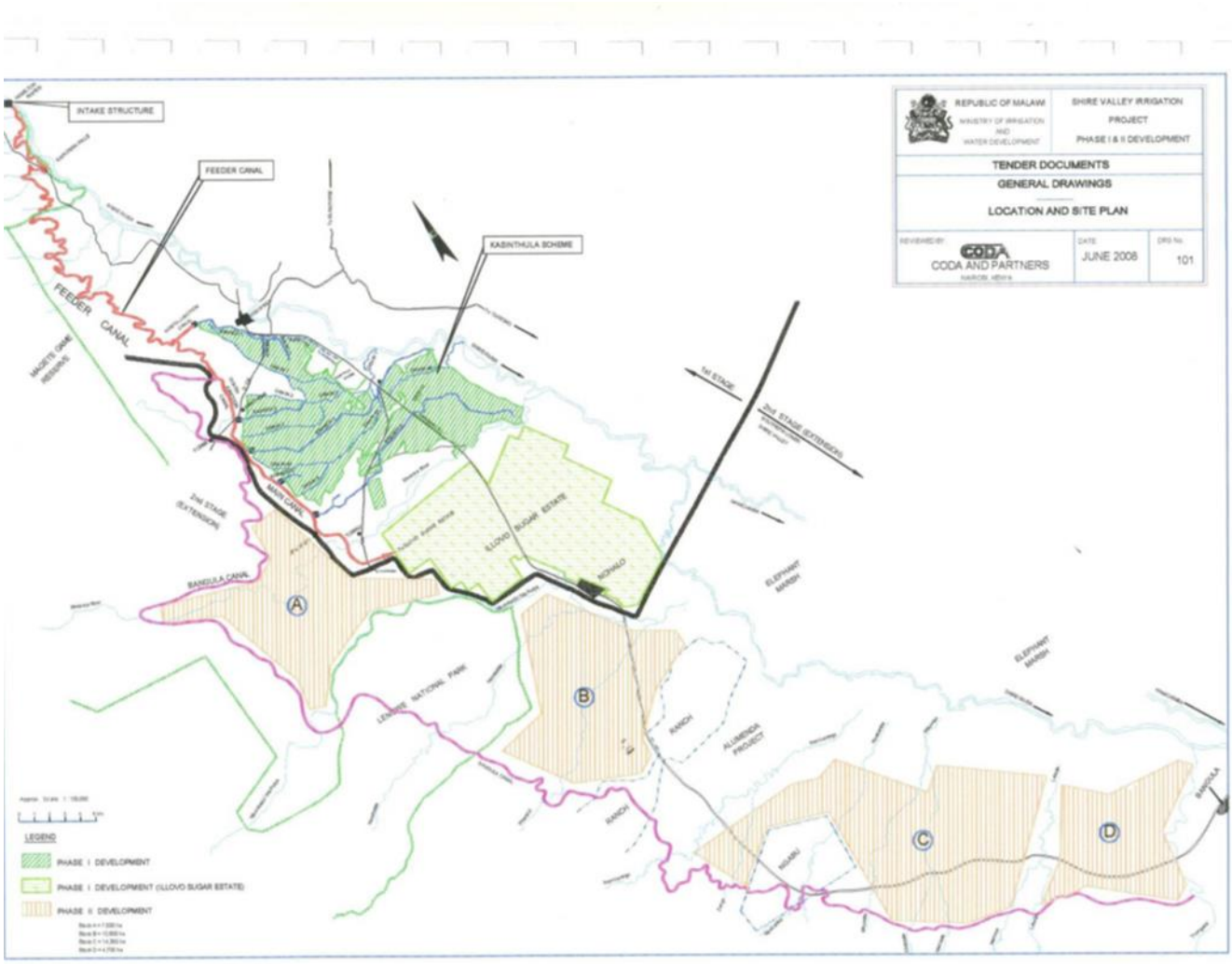
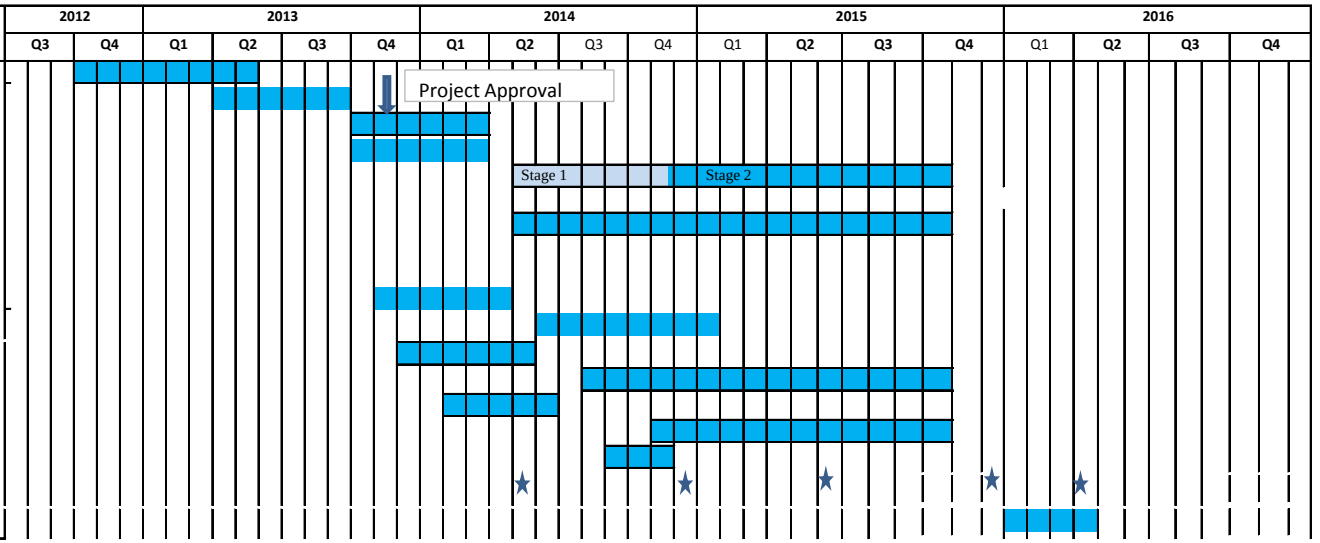


Figure 2. System Layout.

Annex 2: Implementation Schedule

ID	Activities for Phase I Preparation
1	Carry out additional study on water available at Kapichira
2	Carrying out aerial photography through the on-going Water Development Program
3	Procure Communications, Community Participation & Capacity Building Provider
4	Procure feasibility study consultant
5	Prepare & approve communications strategy/gender strategy/facilitate participatory planning process
6	Carry out technical feasibility study (incl procurement of high res imagery, aerial photography & mapping, soil surveys, socio-economic surveys, preliminary designs, cost estimates, financial & economic analysis)
2	Procure hydraulic model
7	carry out hydraulic model tests for proposed Kapichira intake
9	Procure Interim Transaction Adviser for PPP feasibility study
10	Carry out PPP feasibility study
11	Procure ESIA consultant
12	Carry out ESIA & prepare PMP, EMP & RAP
13	Appoint Dam Safety Panel
13	Steering committees
13	Donors conference and project closure



Annex 3: Cost Estimate (amounts in Euro)

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
CORE ACTIVITIES															
Component no. 1: Preparatory Studies															
Communication, Community Participation and Capacity Building															
Remuneration															
Social Scientist/Team Leader	m/m	21		21	19 000	399 000		**399 000**				399 000		399 000	
Communications Specialist	m/m	7		7	13 000	91 000		**91 000**				91 000		91 000	
Gender Specialist	m/m		3	3	10 000		30 000	**30 000**					30 000	30 000	
Agribusiness/contract farming specialist	m/m	4		4	13 000	52 000		**52 000**				52 000		52 000	
Irrigation specialist	m/m	2		2	13 000	26 000		**26 000**				26 000		26 000	
District Facilitators	m/m		42	42	2 500		105 000	**105 000**					105 000	105 000	
Rural Sociologist	m/m	4		4	13 000	52 000		**52 000**				52 000		52 000	
Cadastral Surveyor	m/m	6		6	13 000	78 000		**78 000**				78 000		78 000	
Training Specialist	m/m	4		4	13 000	52 000		**52 000**				52 000		52 000	
Trainers	m/m		42	42	1 200		50 400	**50 400**					50 400	50 400	
Enumerators	m/m		42	42	450		18 900	**18 900**					18 900	18 900	
Secertariat / Adminstrative	m/m		21	21	1 000		21 000	**21 000**					21 000	21 000	
Drivers	m/m		84	84	175		14 700	**14 700**					14 700	14 700	
Sub-total Remuneration						**750 000**	**240 000**	**990 000**	**0**	**0**		**750 000**	**240 000**	**990 000**	**0**
Other Expenses															
Allowance (per-diem, accommodation)	m/m		45	45	2 000		90 000	**90 000**					90 000	90 000	
International Air Travel	No.		15	15	1 200		18 000	**18 000**					18 000	18 000	
Training Courses	No		12	12	2 500		30 000	**30 000**					30 000	30 000	
Workshops	No		3	3	1 100		3 300	**3 300**					3 300	3 300	
Meetings	No		20	20	400		8 000	**8 000**					8 000	8 000	
Twin-cab pick ups	vehicle		3	3	21 500		64 500	**64 500**					64 500	64 500	
Motor cycles	vehicle		6	6	3 200		19 200	**19 200**					19 200	19 200	
Minibus	vehicle		1	1	27 500		27 500	**27 500**					27 500	27 500	
Computer & peripherals	set		3	3	6 000		18 000	**18 000**					18 000	18 000	
Photocopier	machine		1	1	7 500		7 500	**7 500**					7 500	7 500	

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
Office furniture	set		5	5	2 500		12 500	**12 500**					12 500	12 500	
Publicity/training equipment	set		2	2	2 500		5 000	**5 000**					5 000	5 000	
Office consumables	office-months		18	18	700		12 600	**12 600**					12 600	12 600	
Vehicle operating cost - T/C pick-up	v-month		54	54	375		20 250	**20 250**					20 250	20 250	
Ditto motor cycle	v-month		108	108	50		5 400	**5 400**					5 400	5 400	
Ditto bus	v-month		18	18	450		8 100	**8 100**					8 100	8 100	
Communications, Documentation	l/s		1	1	2 500		2 500	**2 500**					2 500	2 500	
Less Residual Value of Vehicles	l/s		1	1	-44 480		-44 480	**-44 480**					-44 480	-44 480	
Rouded							2 130	**2 130**					2 130	2 130	
Sub-total Reimbursable Expenses						**0**	**310 000**	**310 000**	**0**	**0**	**0**	**0**	**310 000**	**310 000**	**0**
TOTAL COOMUNICATION, COOMUNITY PARTICIPATION, AND CAPACITY BUILDING						**750 000**	**550 000**	**1 300 000**	**0**	**0**	**0**	**750 000**	**550 000**	**1 300 000**	**0**
Hydraulic Modeling of Intake Site	l/s	1		1	200 000	200 000		**200 000**				200 000		200 000	
TOTAL HYDRAULIC MODELLING OF INTAKE SITE						**200 000**	**0**	**200 000**	**0**	**0**	**0**	**200 000**	**0**	**200 000**	**0**
Technical Feasibility Study															
Remuneration															
Irrigation Engineer/Team Leader	m/m	16		16	21 000	336 000	0	**336 000**	336 000		336 000				
Irrigation Design Engineer	m/m	12		12	13 000	156 000	0	**156 000**	156000		156 000				
Climate Change Specialist/hydrologist	m/m	3		3	13 000	39 000	0	**39 000**	39000		39 000				
Civil Engineer	m/m	3		3	13 000	39 000	0	**39 000**	39000		39 000				
Geotechnical Engineer	m/m	2		2	13 000	26 000	0	**26 000**	26000		26 000				
Water Supply & Sanitation Engineer	m/m	2		2	13 000	26 000	0	**26 000**	26000		26 000				
Irrigation Agronomist	m/m	3		3	13 000	39 000	0	**39 000**	39000		39 000				
Agricultural Economist	m/m	3		3	19 000	57 000	0	**57 000**	57000		57 000				
Socio-economist	m/m	3		3	13 000	39 000	0	**39 000**	39000		39 000				
WUA/Irrigation Institutions Specialist	m/m	3		3	21 000	63 000	0	**63 000**	63000		63 000				
Soil Scientist	m/m	2	3	5	13 000	26 000	39 000	**65 000**	26000	39 000	65 000				
Enironmentalist	m/m	3	0	3	13 000	39 000	0	**39 000**	39000	0	39 000				
Topo surveyor	m/m	0		0	10 000	0	0	**0**	0		0				

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
GIS and Remote sensing Specialist	m/m	10		10	13 000	130 000	0	**130 000**	130000		130 000				
Enumerators	m/m		50	50	450		22 500	**22 500**	0	22 500	22 500				
Secertariat / Adminstrative	m/m		16	16	1 000		16 000	**16 000**	0	16 000	16 000				
Drivers	m/m		90	90	175		15 750	**15 750**	0	15 750	15 750				
Sub-total Remuneration						**1015000**	**93250**	**1 108 250**	**1 015 000**	**93 250**	**1 108 250**	**0**	**0**	**0**	**0**
Other Expenses															
Allowance (per-diem, accommodation)	m/m		90	90	2 000		180 000	**180 000**		180 000	180 000				
International Air Travel	No.		22	22	1 200		26 400	**26 400**		26 400	26 400				
Soil lab analysis	l/s		1	1	40 000		40 000	**40 000**		40 000	40 000				
Geotechnical investigations	l/s		1	1	120 000		120 000	**120 000**		120 000	120 000				
Topographical surveys	l/s		1	1	40 000		40 000	**40 000**		40 000	40 000				
Workshops	No.		3	3	1 100		3 300	**3 300**		3 300	3 300				
Meetings	No.		20	20	400		8 000	**8 000**		8 000	8 000				
Twin-cab pick ups	vehicle		3	3	21 500		64 500	**64 500**		64 500	64 500				
Computer & peripherals	set		3	3	1 000		3 000	**3 000**		3 000	3 000				
GIS System (incl Plan Printer)	set		1	1	4 500		4 500	**4 500**		4 500	4 500				
Photocopier	machine		1	1	7 500		7 500	**7 500**		7 500	7 500				
Office furniture	set		6	6	2 500		15 000	**15 000**		15 000	15 000				
Office consumables	office-months		18	18	700		12 600	**12 600**		12600	12600				
Vehicle operating cost - T/C pick-up	v-month		54	54	375		20250	**20 250**		**20 250**	20 250				
Communication and documentation	l/s		1	1	2 500		2 500	**2 500**		2500	2 500				
Less Residual Value of Vehicles	l/s		1	1	-25 800		-25 800	-25 800		-25 800	-25 800				
Sub-total Reimbursable Expenses						**0**	**521 750**	**521 750**	**0**	**521750**	**521 750**	**0**	**0**	**0**	**0**
TOTAL TECHNICAL FEASIBILITY STUDY						**1 015 000**	**615 000**	**1 630 000**	**1 015 000**	**615 000**	**1 630 000**	**0**	**0**		**0**

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
Environmental and Social Impact Assessment															
Remuneration															
Team Leader	m/m	10		10	19 000	190 000		**190 000**				190 000		190 000	
Lead Ecologist	m/m	8		8	19 000	152 000		**152 000**				152 000		152 000	
Resettlement Specialist	m/m	5		5	19 000	95 000		**95 000**				95 000		95 000	
Rural sociologist	m/m	6		6	13 000	78 000		**78 000**				78 000		78 000	
Aquatic Ecologist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Terrestrial Ecologist	m/m	2		2	13 000	26 000		**26 000**				26 000		26 000	
Hydrologist	m/m	2		2	13 000	26 000		**26 000**				26 000		26 000	
Environmental Health Specialist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Cultural Heritage Specialist	m/m	1		1	13 000	13 000		**13 000**				13 000		13 000	
Soils Specialist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Drainage & Flood Control Specialist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Integrated Pest Management Specialist	m/m	3		3	13 000	39 000		**39 000**				39 000		39 000	
Secertariat / Adminstrative	m/m		10	10	1 000	0	10 000	**10 000**					10 000	10 000	
Drivers	m/m		30	30	175	0	5 250	**5 250**					5 250	5 250	
Sub-total Remuneration						**697 000**	**15 250**	**712 250**	**0**	**0**	**0**	**697 000**	**15 250**	**712 250**	**0**
Other Expenses															
Allowance (per-diem, accommodation)	m/m		30	30	2 000		60 000	**60 000**					60 000	60 000	
International Air Travel	No.		15	15	1 200		18 000	**18 000**					18 000	18 000	
Workshops	No		3	3	1 100		3 300	**3 300**					3 300	3 300	
Meetings	No		20	20	400		8 000	**8 000**					8 000	8 000	
Twin-cab pick ups	vehicle		3	3	21 500		64 500	**64 500**					64 500	64 500	
Computer & peripherals	set		3	3	6 000		18 000	**18 000**					18 000	18 000	
Office furniture	set		5	5	2 500		12 500	**12 500**					12 500	12 500	
Office consumables	office-months		8	8	700		5 600	**5 600**					5 600	5 600	
Vehicle operating cost - T/C pick-up	v-month		24	24	375		9 000	**9 000**					9 000	9 000	
Communication and documentation	l/s		1	1	2 500		2 500	**2 500**					2 500	2 500	
Less Residual Value of Vehicles	l/s		1	1	-32 250		-32 250	**-32 250**					-32 250	-32 250	
Rounded							600	**600**					600	600	
Sub-total Reimbursable Expenses						**0**	**169 750**	**169 750**	**0**	**0**	**0**	**0**	**169 750**	**169 750**	**0**
TOTAL ENVIRONMENTAL AND SOCIAL IMPACT ASESSMENT						**697 000**	**185 000**	**882 000**	**0**	**0**	**0**	**697 000**	**185 000**	**882 000**	**0**

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
Public Prvate Partenership Feasibility Study															
Remuneration															
Team Leader/PPP Specialist	m/m	3		3	27 500	82 500		**82 500**				82 500		82 500	
Public Institutions Specialist	m/m	1.5		1.5	27 500	41 250		**41 250**				41 250		41 250	
Financial Analyst	m/m	5		5	27 500	137 500		**137 500**				137 500		137 500	
Irrigation Engineer	m/m	3		3	13 000	39 000		**39 000**				39 000		39 000	
Agricultural Economist	m/m	3		3	13 000	39 000		**39 000**				39 000		39 000	
Contracts/Legal Specialist	m/m	1		1	13 000	13 000		**13 000**				13 000		13 000	
Smallholder Agribusiness/Contract Farming Specialist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Farmer Organization/Water Institutions Specialist	m/m	2		2	21 000	42 000		**42 000**				42 000		42 000	
Rural Sociologist	m/m	1.5		1.5	13 000	19 500		**19 500**				19 500		19 500	
Secertariat / Adminstrative	m/m		7	7	1 000		7 000	**7 000**					7 000	7 000	
Drivers	m/m		18	18	175		3 150	**3 150**					3 150	3 150	
Sub-total Remuneration						**433 250**	**10 150**	**443 400**	**0**	**0**	**0**	**433 250**	**10 150**	**443 400**	**0**
Other Expenses															
Allowance (per-diem, accommodation)	m/m		15	15	2 000		30 000	**30 000**					30 000	30 000	
International Air Travel	No.		8	8	1 200		9 600	**9 600**					9 600	9 600	
Outreach Workshops	No		3	3	4 250		12 750	**12 750**					12 750	12 750	
Meetings	No		20	20	1 250		25 000	**25 000**					25 000	25 000	
Twin-cab pick ups	vehicle		3	3	21 500		64 500	**64 500**					64 500	64 500	
Office furniture	set		5	5	2 500		12 500	**12 500**					12 500	12 500	
Office consumables	office-months		7	7	700		4 900	**4 900**					4 900	4 900	
Vehicle operating cost - T/C pick-up	v-month		24	24	375		9 000	**9 000**					9 000	9 000	
Communication and documentation	l/s		1	1	1 500		1 500	**1 500**					1 500	1 500	
Less Residual Value of Vehicles	l/s		1	1	-45 150		-45 150	**-45 150**					-45 150	-45 150	
Sub-total Reimbursable Expenses						**0**	**124 600**	**124 600**	**0**	**0**	**0**	**0**	**124 600**	**124 600**	**0**
TOTAL PUBLIC PRIVATE PARTENERSHIP FEASIBILITY STUDY						**433 250**	**134 750**	**568 000**	**0**	**0**	**0**	**433 250**	**134 750**	**568 000**	**0**

Description	Unit	Quantity Foreign	Quantity Local	Quantity Total	Unit Cost	Total Foreign Cost	Total Local Cost	Total	Foreign Costs AWF	Local Costs AWF	Total Costs AWF	Foreigh Costs IDA Projects	Local Costs IDA Projects	Total Costs IDA Projects	GoM
Dam Safety Panel															
Remuneration															
Dams Engineer	m/m	0.3		**0.3**	21 000	6 300		**6 300**				6 300		6 300	
Hydrologist	m/m	0.3		**0.3**	21 000	6 300		**6 300**				6 300		6 300	
River Morphologist	m/m	0.3		**0.3**	21 000	6 300		**6 300**				6 300		6 300	
Geotechnical Engineer	m/m	0.3		**0.3**	21 000	6 300		**6 300**				6 300		6 300	
Rounded						-200		**-200**				-200		-200	
Sub-total Remuneration						**25 000**	**0**	**25 000**	**0**	**0**	**0**	**25 000**	**0**	**25 000**	**0**
TOTAL DAM SAFETY PANEL						**25 000**	**0**	**25 000**	**0**	**0**	**0**	**25 000**	**0**	**25 000**	**0**
TOTAL COMPONENT 1						**3 120 250**	**1484750**	**4 605 000**	**1 015 000**	**615 000**	**1 630 000**	**2 105 250**	**869 750**	**2 975 000**	**0**
Component no. 2: Project Coordination															
Project coordinator	m/m		24		3 000		72 000	**72 000**					72 000	72 000	
stakeholder workshops	No		5	5	7 000		35 000	**35 000**					35 000	35 000	
Donors' Conference	No		1	1	5 500		5 500	**5 500**					5 500	5 500	
4 WD twin cab	Vehicle		1	1	27 500		27 500	**27 500**							27 500
Vehicle operating costs (per vehicle month)	v-months		48	48	375		18 000	**18 000**							18 000
Computer and prephireals	set		2	2	6 000		12 000	**12 000**					12 000	12 000	
photocopier	set		1	1	7 500		7 500	**7 500**					7 500	7 500	
Office furniture	Sum		1	1	2 300		2 300	**2 300**							2 300
Office consumables	office-months		24	24	700		16800	**16 800**							16 800
Office Running Cost	months		24	24	100		2400	**2 400**							2 400
Preparation of reports	l/s		1	1	3 500		3 500	**3 500**					3 500	3 500	
TOTAL PROJECT COORDINATIN						**0**	**202 500**	**202 500**	**0**	**0**	**0**	**0**	**135 500**	**135 500**	**67 000**
TOTAL BASE COST CORE ACTIVITIES						**3 120 250**	**1 687 250**	**4 807 500**	**1 015 000**	**615 000**	**1 630 000**	**2 105 250**	**1 005 250**	**3 110 500**	**67 000**
CONTINGENCY around 10%						**312 025**	**168 725**	480 750	101 500	61 500	163 000	210 525	100 525	311 050	6 700
GRAND TOTAL CORE ACTIVITIES						**3 432 275**	**1 855 975**	**5 288 250**	**1 116 500**	**676 500**	**1 793 000**	**2 315 775**	**1 105 775**	**3 421 550**	**73 700**
Percent of Grand Total						**64.904%**	**35.096%**		21.113%	12.793%		43.791%	20.910%		1.394%
CONTRIBUTIONS						**5 288 250**			1 793 000			3 421 550			73 700
Percent Contribution								**100.000%**			33.905%			64.701%	1.394%

Annex 5: draft terms of reference for the feasibility study

DRAFT

MINISTRY OF WATER DEVELOPMENT AND IRRIGATION

SHIRE VALLEY IRRIGATION PROJECT (SVIP)

TECHNICAL FEASIBILITY STUDY

TERMS OF REFERENCE

Department of Irrigation,
P.O. Box 30797,
Lilongwe 3.
Tel: +265 1 752 122
Fax: +265 1 751 459

November, 2013

Contents

1. Introduction

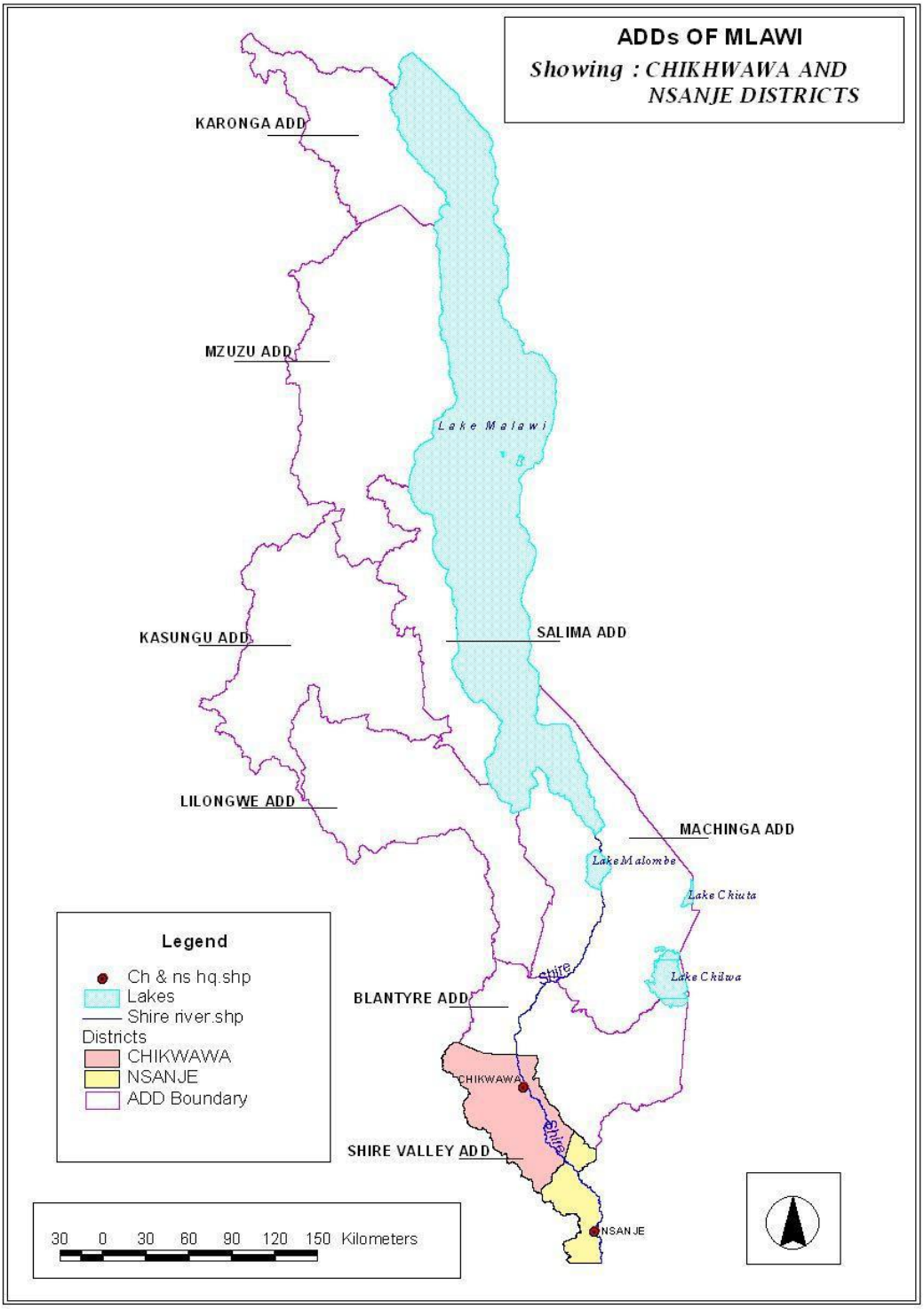
Malawi's economy remains agro-based. Agriculture accounts for more than 80 percent of export earnings, contributes 38 percent of gross domestic product (GDP), and provides a livelihood for 85 percent of the population. However, the country has depended on rain-fed agriculture to achieve food security, increased income and ensure sustainable socio-economic growth and development. Smallholder farmers contribute about three-quarters of agricultural production with cropping systems dominated by a low-value, maize-based rain-fed cropping system. Over-dependence on rain-fed agriculture has led to low agricultural production and productivity due to weather shocks and natural disasters.

Given the heavy dependence on agriculture for the economy and food production, and in view of the need to shift away from uncertainties related to rain-fed agriculture, Government of Malawi (GoM) continues to embark on small, medium and large scale irrigation development, in line with the Government's overall development agenda as stipulated in the Malawi Growth and Development Strategy (MGDS). To this end, the GoM intends to develop irrigated agriculture in the Lower Shire Valley (on the west (right) bank of the Shire River) within the administrative districts of Chikhwawa and Nsanje. The GoM has requested financial assistance from the World Bank (WB) and the African Water Facility / African Development Bank (AWF/AfDB) for the preparation of Shire Valley Irrigation Project (SVIP). Accordingly, the World Bank and African Development Bank are supporting the Government with the preparation of comprehensive studies required to appraise the technical feasibility, economic viability, environmental sustainability of the Shire Valley Irrigation Development Project (SVIP).

2. Background

The location map of the proposed SVIP is shown in Map 1. Since the 1940s, the GoM has been interested in the implementation of SVIP to develop irrigation in the Lower Shire Valley. Since then, the proposed project has been the subject of a large number of surveys and studies but so far these studies have not resulted in the preparation of a detailed project proposals and design acceptable for funding by donor agencies. A complete list of the studies conducted to date is provided in Annex 1 to this TOR. On request, these studies will be made available for desk reference to any consulting firm interested in submitting a proposal for a detailed feasibility study in response to the specific Request of Proposal (RFP) at the Department of Irrigation (DoI), Lilongwe.

Map 1: Project location



The latest in the series was an ADB-funded study by CODA and Partners in 2008 that was intended to synthesize the outputs from the previous studies and formulate a 42,000 ha irrigation project. Following this study and in November 2009, the GoM sought assistance from the AfDB and the World Bank for the preparation of a fresh detailed project proposal for SVIP to be submitted to prospective donors for consideration for investment funding. In response, the AfDB provided Grant funding support from its African Water Facility (AWF) to the GoM to examine and update the existing studies towards the formulation of a detailed project for the SVIP. It undertook an Appraisal Mission in July 2010 to examine gaps in the information and knowledge and determine focus areas for updating the previous studies. This was followed by a joint WB/AfDB identification mission in January 2011. During the identification mission in January 2011, both the AfDB and the WB reviewed the latest feasibility report and proposals of CODA (see Annex 1) and concluded with the GoM that additional work would still be required to formulate a "bankable" project. The gaps identified by the joint mission included: (i) confirmation of water availability at Shire river taking into consideration of the irrigation water requirements of the SVIP and future plans for hydropower development downstream of the intake for the SVIP; (ii) the optimum site for the intake structure; (iii) management of the bulk water and infield irrigation infrastructure; (iv) the choice of irrigated crops and marketing; (iv) land consolidation and land allocation policies to smallholders; (iv) operation and maintenance (O&M), cost recovery and sustainability; and (v) role of private sector and possible public-private-partnerships (PPP) for financing different aspects of the project for construction as well as post-project O&M.

As a follow up to the above recommendations of the identification mission, the AWF conducted a preparation/appraisal mission in March 2012 and produced a detailed appraisal report. In the meantime, the GoM commissioned three further studies to assess, (a) the options for a Public-Private Partnership (PPP) for the project and (b) the availability of water resources at Shire River for the SVIP considering future plans for hydropower development, both with WB funding support; and (c) a pre-feasibility study with AWF funding assistance. The pre-feasibility report has found that phased development of 42,500 ha of lands under irrigated agriculture is feasible subject to other conditions required to ensure its economic viability and sustainability. The water availability study[1] concludes that " the implementation of the SVIP is found to be feasible seen from a water availability point of view". Similarly, the PPP study proposes viable options for private sector participation in different aspects of the project. These reports and their recommendations have been endorsed and accepted by the GoM and are available with the DoI for reference.

As per the pre-feasibility report, the development objective of the proposed SVIP would be "to sustainably enhance incomes and hence food security of about 100,000 households in Chikwawa and Nsanje Districts through increased agricultural productivity and

[1] Study on water availability for irrigation and hydropower production on Shire River at Kapichira Falls ; Norplan ; April 2013

profitability by establishing market-linked smallholder farming ventures and professionally operated irrigation services in 42,500 ha of lands".

As per the pre-feasibility report, it is proposed to develop approximately 42, 500 ha for irrigation in two phases (Phase I and Phase II), based on abstracting irrigation water from the River and conveying it by gravity to the irrigable area mainly through open canals. The intake would be located at right bank upstream of the pondage reservoir for Kapichira Hydroelectric Power Station (and therefore lower in elevation) from the originally proposed site at Hamilton's Rapids by past studies. The proposed project area and layout are shown in Map 2. The two phases proposed by the pre-feasibility study are as follows:

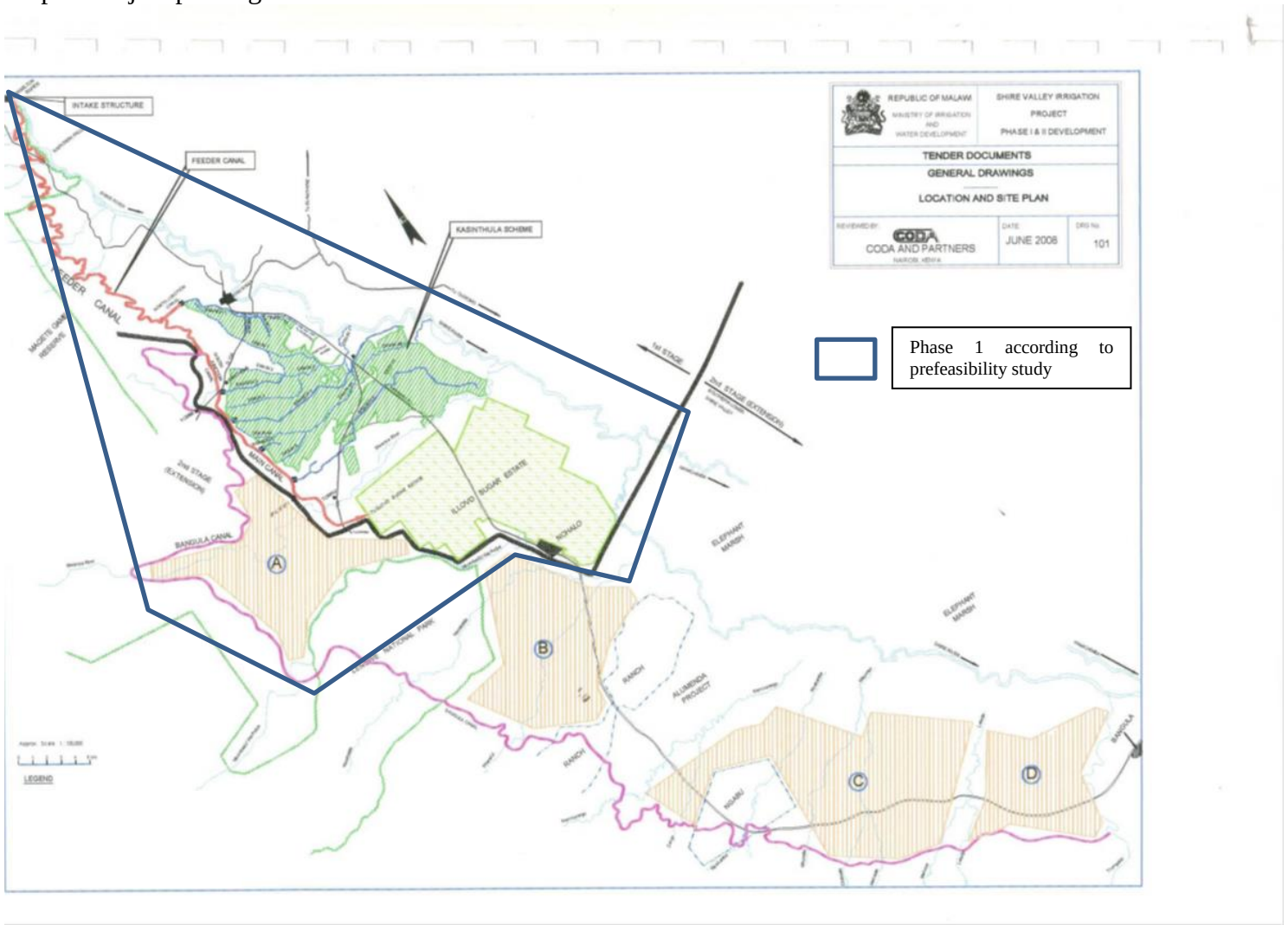
Phase I of the project would extend to 21, 015 ha, of which some 11,705 ha have already been developed for sugar cane by Illovo and 755 ha have been developed by out-growers. As shown in Table 1 below, Phase I (21,015 ha) would include (a) the existing Illovo Estate at Nchalo, (b) the existing cane outgrower scheme at Kasinthula, (c) new land in the vicinity of Kasinthula that would be commanded from the proposed Main Canal and (d) new land in the Mthumba Valley and between the Mwanza River and Lengwe National Park that would be commanded by the first 45 km of the proposed 130 km long Bangula Canal (see Map 2).

Table 1: Details of proposed area to be developed under SVIP

Location	Canal	Net Irrigable Area (ha)
Existing Illovo Nchalo Estate	Main canal	10,950
Existing Kasinthula Cane Growers	Main canal	755
Subtotal existing/already developed		11,705
New irrigable land in vicinity of Kasinthula	Main canal	5,515
New land in the Mthumba Valley	Bangula canal	935
New land between Mwanza River and Lengwe Game Reserve	Bangula canal	2,860
Subtotal newly proposed		9,310
Total (Phase 1)		21,015

At present, the existing 11,705 ha of Phase I is supplied with irrigation water by pumping directly from the Shire River. It is proposed to convert these existing areas to a gravity water supply under the proposed SVIP, thus saving significant pumping costs. The remaining 9,310 ha would have to be developed for either surface or sprinkler or centre pivot irrigation for smallholders. After the proposed development, of the 21 015 ha of Phase I, 10 950 ha (or 52 percent) would be taken up by existing irrigable land in Illovo Nchalo Estate, and the remaining 10,065 ha (9,310 +755 ha) approximately is expected to be operated and managed by smallholders or their organizations.

Map 2: Project phasing



Phase II (21,485 ha, which is 42,500 – 21,015 = 21,485 ha) would be commanded by the Bangula Canal. Of this area, approximately 2, 855 ha have already been developed by Illovo private company for irrigated sugar cane and the existing pumped water supply would be converted to a gravity supply. The remaining 18, 630 ha would be allocated to smallholders or their organizations.

It is now proposed to locate the intake for SVIP in the right bank of the head-pond for Kapichira Hydropower Station. However, the headpond also acts as a sedimentation basin for the power station, the morphology of which is highly sensitive to the incoming flow, the pond geometry and the flushing regime that has been established over the years. The construction of an intake in the right bank of the headpond would almost certainly modify the morphology and, if not carefully sited, possibly impact on the efficiency with which sediments are flushed from the pond.

However, the pre-feasibility study has recommended that further studies are necessary in order to produce a comprehensive set of information required by the GoM as well as potential donor partners to produce a bankable project:

- A technical feasibility study as well as a mapping based on aerial photography
- A hydraulic model study at the headpond of Kapichira dam to locate the optimum site for the intake in terms of (a) avoiding negative impact on sediment flushing operations at the power station and (b) minimizing the intake of sediment into the proposed feeder canal system of SVIP. ,
- An independent Environmental and Social Impact Assessment (ESIA) leading to the preparation of an Environmental and Social Management Plan (ESMP), including a Pest Management Plan (PMP), and Resettlement Action Plan (RAP) to World Bank and African Development Bank standards for Phase I,
- Preparation and implementation of a Communications, Community Participation and Agricultural Development strategy for the project by a consultant which will be called as Communications, Community Participation and Agricultural Development (CCP & AD) service provider;
- Preparation of a gender strategy to be undertaken by the same CCP&AD service provider;
- Establishment of a Dam Safety Panel (DSP) consisting of a panel of international experts to review safety of Kapichira power dam and Kamuzu barrage to undertake dam safety reviews and make recommendations to ensure safety of these two structures in compliance with the World Bank and African Development Bank operational policy on dam safety.

The results and recommendations of the hydraulic model study and initial recommendations of the DSP are expected to be available to the Detailed Feasibility Study consultant on time. Additionally, during the implementation of this Study, it is expected that all the other studies would be carried out simultaneously so that complementary and supplementary assistance from other consultants as well as data and information from the other studies are expected to be available to Detailed Feasibility Study consultant on time. Ensuring the coordination and sharing data and information

among the different consultants will be the responsibility of the DoI. Appropriate project coordination and supervision arrangements will be established (see section 6).

3. Objective of the assignment

The objective of this assignment is to undertake a detailed feasibility study carrying forward the pre-feasibility study already completed covering the following activities:

- Assist the government in selecting the best technical and institutional options before developing the full feasibility (water allocation optimization, inclusion or not of Illovo Estate, with-without lining, etc.; stage 1);
- Based on the selected options, prepare the preliminary design and assess the technical and economic feasibility of the project (stage 2), taking into consideration its phasing;

The selected Consultant is required to undertake these activities building on the outputs and filling in gaps of the previous studies, and taking into consideration the work and recommendations of the recent studies (Annex 1). It should be noted that while the feasibility study should focus on Phase I of the project, it would be necessary to cover the Phase II area in sufficient detail to confirm that a second phase would be (a) technically feasible and (b) economically viable – because whether or not this phase will eventually proceed, will affect the design capacity of the intake and Feeder Canal.

4. Scope of services

It is imperative that the feasibility study must be carried out in close cooperation with the other studies mentioned above. Consultation with beneficiary communities and stakeholders will be critical to successfully complete this assignment. Throughout its work, the Consultant for this assignment will be guided by the analysis on socio-economic profile, land tenure, gender, livelihood strategies as analysed and developed by the CCP&AD service provider and will have to work closely with the CCP&AD service provider on community consultation. In addition, the Consultant is expected to share the information generated by this study with the other consulting firms whom will be selected and deployed by the Government to undertake all the concurrent studies mentioned above, in particular with the firm in charge of the ESIA. Other linkages are illustrated in the table below:

Other SVIP related consultancy	**Issues of linkage**
Communications, Community Participation	• Close linkage and frequent information sharing • Community Planning on preliminary designs and

and Agricultural Development	impacts • Land use/tenure surveys • Communication Strategy inputs • Grievance Redress on technical issues – two way communication • Agricultural services and agribusiness venture proposals – link to economic/financial/ technical parameters • GIS data management
Feasibility study on Public Private Partnership for irrigation services	• Provide technical/financial boundary conditions for PPP financial model and structure • Structure detailed design/minimum requirements for detailed design if developed for concessionaire
Hydraulic Model study	• Location specifications • Intake design implications • Canal routing options based on intake location
Independent Environmental and Social Impact Assessment	• Screening of social and environmental impacts of design options • Incorporation of recommendations in design and tenders
Dam Safety Review Panel	• Technical parameters/dependence on critical water infrastructure (Kapichira, Kamuzu)
Project Coordination Unit	• Reporting • Information sharing • Information management • Liaison with wider GoM

This specific feasibility study must be carried out covering relevant engineering, agronomic, agricultural, sociological, institutional, environmental, economic and financial aspects. Following initial work planning and scheduling, the study will be carried out in two stages: (i) propose and assess based on a multi-criteria analysis various technical options in order to assist the Government in better defining the scope of the project, (ii) preparation of full feasibility study reports to recognized international standards and "bankable" level to be submitted to the donors for appraisal and follow on decisions for investment funding support;

Further elaboration of the scope is as follows:

4.1 Stage 1: assessment of options, negotiation with Illovo Estate, and water allocation optimization

4.1.1 Objectives

Previous studies raised number of issues or options that require an arbitrage from the DoI before developing the full feasibility study. Informed decision making needs to be enlightened by sound analysis. The objectives of this first stage are as follows:

(i) Undertake additional surveys and develop a Geographical Information System (GIS) that will inform the assessment of options as well as the development of the feasibility study;
(ii) review and assess all technical options related to location of irrigated areas, phasing, irrigation layout and plot irrigation techniques, farming systems to be promoted, water allocation, etc. in order to assist the DoI in better defining the scope of the project by selecting the best combination of options.
(ii) In close collaboration with the PPP Advisor, conduct a financial assessment aimed at assisting the DoI in negotiating Illovo Estate's participation in the project funding;
(iii) Based on the options selected and the participation (or non-participation) of Illovo Estate in the project, refine the water requirements for the scheme, and optimize the water allocation for the various uses.

4.1.2 Preliminary investigations and development of a Geographical Information System

4.1.2.1 Preliminary investigations

Previous studies include number of investigations. The consultant shall in addition carry out the following surveys in order to assess technical options (stage 1) and during stage 2 develop the feasibility study and preliminary designs[2]. The geographical scope of these investigations should cover an area allowing to delimit the gross irrigable area taking into account all the constraints developed in the ToR: topography, soils, environmental and urban reserves, etc. The consultant shall specify in its proposal the geographical scope of each survey. As a first approach, it should cover the area as defined to the West and South by the canal originating at Kapichira (according to Coda Design), to the North and East by the Shire River (see map 2).

Topography:

- The following items will be provided to the consultant :
    - ii) High resolution digital terrain model;

[2] Stage 2 investigations mainly encompasses geotechnical surveys and field topographical surveys

- iii) Accurate orthophoto maps in digital formats including original source data used to produce base and orthophoto maps;
- iv) An orthophoto map of scale of 1:10,000 for the project area

- The detailed topographical surveys required to develop the preliminary design will be carried out during stage 2, once the main technical options are selected. However the Consultant shall provide during stage 1 the required topography and bathymetry to prepare the preliminary design of the flood control infrastructure.

Soil surveys:

- Carry out high intensity (semi-detailed) soil surveys for the above mentioned area to fill any gaps from existing soil surveys from previous work. These detailed soil surveys, including sampling, observations and final soil survey maps, should be in conformity with FAO/UNESCO guidelines for feasibility-level soil surveys.;
- Setup a suitable standard land classification system for assessment of irrigability and drainability within the proposed irrigation development areas, and use topographic and soil survey results and other relevant information to delineate and evaluate land units in terms of suitability for irrigated agriculture development;
- Collect and analyse soil samples required for the determination of standard physical and chemical properties of the soils required for evaluation of soil suitability for the proposed crops. The Consultant should take appropriate measures to verify and ensure quality and reliability of laboratory testing and results.
- Critically evaluate and analyse findings of the soil surveys and land characteristics of the proposed project area and identify and delineate major land systems and categories;
- prepare soils and land suitability maps for the various cropping options studied;

Geotechnical investigations:

- carry out geotechnical investigations along the feeder canal in order to quantify the seepage (stage 1) and provide the required information for the preliminary design (stage 2);

Hydrogeology:

- collect all available and relevant hydrogeological data of the proposed development areas required for evaluation of: (a) present and historical ground water table levels and fluctuations/behaviour; (b) ground water potential in the area in terms of groundwater availability, safe yield and groundwater quality; and (c) future ground water regime and behaviour after the development of irrigation in the project area; (d) impacts of seepage and percolation and drainage from the irrigation canals; and (e) identification of drainage control and ground water table control, ground water quality control measures that need to be incorporated into the detailed design and O&M of the proposed scheme.

Floods:

- collect available data on flooding in the project area supplemented with information collected from local people on history of occurrence, intensity and damage caused by

floods in the project area; Prepare broad mapping of the flood plain extension. Assess the frequency of occurrence of the mapped floods.

Socio-economics:

- Develop a socio-economic survey in Phase I and II areas and use the findings to establish the "without project situation" (in particular crop budgets). The survey should include, but not be limited to, collection and critical review and analysis of all available data and information relating to the existing cropping patterns, farming systems, land tenure and holdings, prices, costs and returns in the proposed irrigation development areas; Given that the CCP&AD service provider will also carry out a socio-economic survey, both Consultant shall closely liaise in order to avoid duplication and share data and results.
- carry out an analysis of existing and potential value chains for smallholder farmers/smallholder organizations and prepare detailed cropping patterns, crop budgets and farm models for the most promising options, with a clear exposition of the origin and validity of prices used – and feed this information in a participatory verification exercise and value chain development support facilitated by the CCP & CB provider;

4.1.2.2 Development of a Geographic Information System (GIS) for the project

The Consultant shall establish a geographical information system (GIS) that will be used all along the study and maintained beyond through the detailed design and implementation stages, residing in the end with the proposed Irrigation District as a kind of elaborate 'project life file'. The GIS shall be built upon the new aerial photography and digitized mapping that shall be prepared as a part of the feasibility study;

The GIS shall basically include all relevant data collected and results gained through the consultancy, in particular: land use without and with the project, soil classes, main ecosystems of interest, human settlements, boundaries of traditional authorities (if this is not too sensitive), groundwaters, surface waters, rural and asphalted roads, water supply and sanitation facilities, etc… and the designed irrigation network, as well as the two hundred or so existing irrigation schemes. Data from the CCP&AD service provider shall also be included in the GIS: arable land holdings, land tenure, communal grazing land, private lands cadastral survey, resettlement details, and so on. The GIS shall also be enriched with layers provided by the Consultant in charge of the EIA. The Feasibility Study Consultant will be in charge of defining the specifications of the layers and data formats for the other Consultants, and integrating their data in the GIS.

It shall be use all along the feasibility stage, in order to inform the decision making as well as the consultation process. The Consultant shall detail in its technical proposal the contain of the GIS.

The development and establishment of the GIS should be carried out together with the counterpart staff nominated by the MoAFS and MoWDI as a means of training and internal capacity building.

4.1.3 Assessment of technical options

The consultant shall critically review previous studies, undertake field visits, and interview main stakeholders in order to list the options that require a decision making before preparing the feasibility study. In particular, the Consultant shall study and comprehend recommendations and related assumptions of the Water Availability Study completed recently.

The Consultant shall submit to the DoI a note justifying the list of options to be assessed before engaging in their analysis. The following options shall be part of this list:

- **With / Without Illovo Estate**: including or not Illovo Estate in the scheme has major implications on the design, cost, profitability and institutional arrangements of the project. As Illovo Estate's position toward the project is not yet established, the Consultant shall assess both options and analyse to which extent a modification of the project scope may allow to preserve the economic profitability of the investment in the "without Illovo" option.
- **Irrigable areas to be developed:** a broad analysis, based on available data, shall allow delimiting areas to be developed, based on soils aptitude, topography, existing farming systems, grazing areas, ecosystems to be protected, etc. The consultant shall use thematic mapping to demonstrate its conclusions.
- **With/ without lining the feeder canal**: Sogreah 1992's design concluded the feeder canal should be lined. The Consultant shall review this conclusion based on recent evolutions of the project scope, of lining techniques, partial lining options, and of the cost of works in similar conditions.
- **Main Canal optimisation:** the possibility of commanding the entire area proposed for Phase I development (21,015 ha) from the Main Canal (e.g. by locating additional irrigable land in the Kasinthula area) shall be assessed, to avoid the need to construct part of the Bangula Canal in Phase I; The Consultant shall also analyse the interest of a pressurized bulk conveyance to parts of the scheme for improved efficiency and enabling overhead irrigation without additional pumping cost;
- **Phasing of the project**: the project phasing should maximize profitability, inclusivity, and be favourable to a PPP implementation. The consultant will compare various phasing options.
- **Type of cropping patterns**: the type of cropping pattern and farming systems to be promoted is obviously a major element that will affect profitability, financial sustainability, inclusivity as well as the environmental impacts of the project. The Consultant will determine (a) potential crops, cropping patterns and crop rotations; (b) corresponding appropriate field-level irrigation technologies; (c) optimum crop-specific husbandry and management practices including agrochemical and other input quantity; and (d) corresponding yield, cost of production and financial return expectations (crop

budgets); all on the basis of agro-climatic conditions, soil and land suitability evaluations, agricultural statistics and research findings, farmer preferences and capabilities, and market and other considerations. The Consultant shall carefully study corresponding options for smallholders, outgrowers, and Illovo Estate.

- **Type of field level irrigation systems**: irrigation systems should be adapted to the farming systems as well as to the financial capacity of the farmers. Options should allow differentiating the recommended irrigation systems for Illovo Estates, outgrowers, and small holders.
- **Options to mitigate environmental impact:**, especially on designing alternatives for crossings through protected areas, and to identify preliminary biodiversity reserves/hotspots within the gross irrigation area, to be weighed in the overall concept design later.
- **Use of other water resources**: the consultant shall investigate and recommend feasibility and options for augmenting the SVIP surface water supply with ground water and conjunctive use of surface and ground water in the command areatoto reduce risk of irrigation water scarcity during dryspells; also investigate options for within system storage and beneficial use of rivers other than the Shire passing through the command area for nested/conjunctive systems within SVIP;
- **With/ without maintaining current pumping system**: The Consultant shall carry out technical, financial and economic assessment of options for maintaining current pump based systems for use in times of peak demand/water scarcity, and their impacts on scheme design, construction and operations cost, as well as on other uses (mainly hydropower).

The above listed options shall be compared through a multi-criteria approach, and based on the results of the above mentioned additional investigations. The multi-criteria approach should at least combine:

- A broad life cost estimate;
- An economic assessment (in economic prices);
- when relevant, a financial assessment of the interest of the option for the concerned stakeholders: Private Party, Water Users Organizations, Illovo estate, farmers;
- Environmental and Sociological impacts;

Depending of the option, the Consultant shall also propose and assess any other relevant criteria: inclusivity, gender, greenhouse gas emission reduction, etc.

The Consultant will also draw lessons from a rapid technical and economic diagnostic of existing schemes (mainly Illovo and Kasinthula) to enlighten the options assessment.

4.1.4 Financial assessment of Illovo Estate participation in the project funding

Illovo Estate participation in the project funding is a major element impacting the design and profitability of the project. The Consultant shall estimate, based on previous studies, the part of the project cost that is linked to Illovo estate water supply, and based on the expected savings and other advantages that Illovo would benefit from the scheme, estimate, in close collaboration with the PPP advisor, the level of financial participation that should be acceptable by the company. The Consultant shall assist the DoI during negotiations with Illovo, in particular by refining its financial assessment based on information given by Illovo Estate during negotiations.

4.1.5 Water requirements and optimisation of the water allocation between uses

Optimisation of the water allocation between uses
The Consultant shall:

- Collect all existing available agro-meteorological data (temperature, evapotranspiration, rainfall, etc.) required for estimation of crop water requirements and irrigation water requirements of the scheme, verify the reliability and accuracy of data, and make corrections as necessary before use. In that context, quality analysis of collected data and filling in of all missing data using appropriate standard approaches and techniques is necessary.
- Based on the options selected, estimate of farm and project level irrigation requirements for the different viable crops, cropping patterns and crop rotations and irrigation technologies to be adopted, taking account of the levels of efficiency that are likely to be achieved by commercial estates and smallholders, for both Phase I and Phase II, using FAO CROPWAT (or similar package); Differences with previous studies results shall be justified.
- Based on a probabilistic approach of the water resource availability, optimise the balance between water uses at the river basin level, including environmental flows, and propose water allocation rules. The optimisation shall be based on a multi-criteria analysis, including an economic assessment (in economic prices), and shall consider future water uses development in the Lake catchment, that could reduce water availability in the Shire River. For this analysis, the consultant shall liaise with consultancies on Shire Basin Planning and hydromet that are ongoing within the multi-sector Shire River Basin Management Program.
- Quantify the impact of climate change on the irrigation water requirements as well as on the water balance of the river basin.
- Depending on the result of the above analysis, adjust the area irrigable and/or adapt the proposed cropping patterns.

Occurrence of a long series of dry years and mitigation measures

The "study on water availability for irrigation and hydropower production on Shire River" (Norplan, 2013) concludes that "the implementation of SVIP is found feasible seen from a water availability point of view, and the preparation for the implementation of the project should continue". However this study also mentions that from 1908 to 1935 there was no outflow from the lake and assesses the exceedance probability of a similar event about 90%. This means that, for a given 20 year period, the probability that the average free water is lower than the value for this period (-27 m3/s) is approximately 10%.

The occurrence of such a hydrologic scenario is obviously a threat to the development of irrigation on the river basin. However the causes of these two decades without flow are not analysed in the report. Other papers[3] consider that the cause of this is the damming effect of sedimentation (sand bar) at the outlet of the Lake. In addition, during the whole period without outflow from the lake, the recorded lake levels are always higher than the natural weir immediately downstream to the outlet (269 a.s.l). This fact seems to show there is a possibility of limiting the occurrence of a no outflow event by better managing the Lake outlet.

The Consultant shall:

- Analyse the causes of this series of "no outflow" years using existing studies and archival materials, or any other means, and better quantify the risk of occurrence of such a scenario;
- Assess and compare possible mitigation measures: management of the sedimentation at the lake outlet, mobilisation of the tranche of water until the natural weir level, mobilisation of additional water resources (tributaries downstream to the lake outlet bring in average 60 m3/s to Kapichira; groundwater), improvement of the dam management rules, reduction of the irrigable area, etc. This measures will be compared in terms of broad cost estimate, efficiency, and environmental impact.
- Determine the occurrence probability of such an event, and revise the optimum irrigable area taking into account the mitigation measures listed above.

4.1.6 Consultation and decision making process

The decision making process will be informed by the results of the consultation process organized by the CCP & AD team. The consultant will participate in the consultation meetings, in order to present the results of stage 1, answer to the stakeholders' questions, and understand their main concerns related to the project.

A steering committee, based on results of this consultation process and on stage 1 report, shall select the options. Negotiations will be held with Illovo by DoI to obtain an official

[3] Among which: N.Shela, Naturalisation of Lake Malawi levels and Shire River flows ; 2000 ; Water Net Symposium, Maputo

decision from the company regarding their inclusion (or not) in the scheme. The consultant will assist the DoI during negotiations.

At the end of the process, DoI will specify to the Consultant the decisions made regarding the scope of the project, and its phasing.

The consultant shall consequently map the gross irrigable area and main infrastructures and delimit phase 1 and phase 2.

4.2 Stage 2: feasibility study

4.2.1 Objectives

The objective of stage 2 is to develop the preliminary design and to assess the technical, social, environmental, institutional and economic feasibility of the project. This requires additional investigations as well as the development of a GIS that will support an informed decision making.

The feasibility will also encompass a Water Supply and Sanitation development plan, in line with the recommendations of the pre-feasibility study.

4.2.2 Additional investigations

The Consultant shall complete the investigations campaigns carried out during stage 1, in order to get the required level of information to properly develop the preliminary designs. The following investigations will in particular be carried out/

Topography:

- Provide 1:200 to 1:500 maps for the design of the main structures as well as any ground survey needed for the preliminary design.

Geotechnical investigations:

- carry out the geotechnical investigations required to undertake the preliminary design, in particular (i) at the proposed site for the major irrigation intake sluice/structure from Shire river upstream of Kapichira power plant, adequate to understand foundation conditions and for detailed engineering designs of the intake sluice and silt control and ejection structures, (ii) at the site of the main structures of the scheme, and (iii) along the dikes and secondary canals;
- Identify, investigate and record the construction material types in quantities, and quality, as well as their proximity to project area availability.

In addition the GIS will be used to develop the preliminary design and enriched all along stage 2.

4.2.3 Adaptation of the scheme to environmental and socio-economic constraints

Before developing the preliminary design, the Consultant shall propose and study detailed adaptations of the scheme (layout, alignment, profile, etc.) to specific challenges linked to environmental and sociologic issues. This approach shall be conducted in close collaboration with the Consultants in charge of the ESIA and of the CCP&AD services. These adaptations will in particular encompass mitigation measures linked to the following issues:

- **Majete Wildlife Reserve, Lengwe National Park**: in order to mitigate the impact of the feeder canal on these natural areas, the Consultant shall consider the extent to which (i) existing wildlife movements cross the proposed canal route; (ii) the canal design could feasibly be modified (through fencing, gently sloping sides, wildlife crossing structures, wildlife climb-out areas, and perhaps a clay rather than paved surface) so as to avoid becoming a high mortality area for various wildlife species; (iii) the canal could enhance wildlife habitats by bringing water into currently dry sections of the Park, based on a (to be determined) Park water right; (iv) the canal's visual impacts could be acceptable from a tourism standpoint; and (v) construction-related impacts (noise, influx of workers, increased poaching risks) could be adequately mitigated.
- **Elephant Marsh**: the abstraction of roughly 30-50 m3/sec of water by the Scheme would reduce the water supply to this wetland, with some potential shrinkage in its area. The Consultant shall propose measures to mitigate the impacts of the projects on the Elephant Marsh ecosystem.
- **Identification of environmental, grazing and urbanisation reserves:** liaising with the ESIA and CCP&AD consulting teams, the consultant shall identify and map land reserves linked to future urbanization needs, major grazing areas and ecosystems, biological corridors, grazing corridors, as well as projected infrastructures. This reserves will not be included in the net irrigable area.
- **Invasive fish species:** if the natural barriers to the migration of invasive fish species towards the Malawi Lake are bypassed by the scheme (assessment under the responsibility of the ESIA Consultant), the Consultant shall propose multiple robust physical barriers to upstream fish movements.
- Health: irrigation schemes may induce the development of water related diseases. The Consultant shall propose adaptation of the scheme to mitigate this impact.
- Groundwater: The Consultant shall propose adaptation of the project to manage ground water table against possible adverse effects of seepage and percolation from the irrigated command areas.

In addition, closely liaising with the CCP&AD team the Consultant will adapt the layout and the irrigation blocks to socio-economic considerations such as social cohesion for Water User Associations.

4.2.4 Carbon finance potential

The Consultant will assess he project potential in terms of Carbone Finance, and propose adaptation of the project technologies or lay out aimed at mobilizing Carbone Finance.

4.2.5 Preliminary design

Based on stage 1 conclusions as well as on the selected adaptations of the scheme mentioned above, the Consultant will develop the preliminary design of phase 1 (i.e. feasibility level). In particular, the consultant will:

- Assess the options for location, design and water management options of the proposed intake at Kapichira Falls based on the results of physical modelling and geotechnical investigations, for two scenarios: i.e. (a) to serve Phase I only and (b) to serve Phase I and, eventually Phase II;
- Prepare preliminary design for intake structure and other associated structures such as desilting basin; Works linked to the Kapichira dam safety, if any, shall be included in the scope of the preliminary design.
- Prepare preliminary design for the whole scheme: bulk irrigation water supply system (conveyance and distribution canals), major and secondary drainage canals, and on-farm works for Phase I only considering two scenarios: i.e. (a) with the Feeder Canal sized to serve Phase I only and (b) with it sized to eventually serve both phases;
- Estimate nature, locations and approximate number, type and relative sizes of major hydraulic structures as well as other complementary structures such as bridges and culverts in the bulk irrigation water supply system, drainage canal system and on-farm systems to be able to estimate the approximate cost of these structures in the economic and financial analysis; Provide a preliminary design template for each type of structure;
- Assess the options for financing, designing and implementing on-farm irrigation systems;
- Identify, recommend and carry out preliminary designs of measures and works required for minimizing adverse impacts of drainage or canal seepages on the ground water table;
- Identify, recommend and carry out preliminary designs for measures and works required for minimizing risks of floods and storm water drainage to the irrigation system;
- As an integral part of the technical design of the system, recommend water allocation, scheduling and distribution mechanisms within the system, and operating rules for the intake and the Kapichira HEP. These operating rules should be based on principles of technical requirements and efficiency, equity, the proposed governance and management structure, fee structure, and distribution system/structures should be designed in line with the proposed design option;

- Work closely and cooperate with the consultants appointed to carry out the environmental and social impact assessment (ESIA) and ensure that the feasibility level project designs comply in every respect with their recommendations;

4.2.6 Water supply and sanitation

Following the recommendation of the pre-feasibility study, the Consultant shall develop a Water Supply and Sanitation (WSS) master plan for the communities of the project area. This plan shall be based on a survey establishing the baseline and mapping existing facilities, and shall locate and cost the required investments to match with the governmental standards in terms of WSS. A specific approach to foster sanitation will be proposed.

4.2.7 Land tenure, Land consolidation

The Consultant will work in close collaboration with the CCP&AD team which will be in charge of the land allocation, consolidation and resettlement framework, in order to provide to this Consultant all necessary inputs to (i) propose a land consolidation framework, and (ii) map actual land acquisition, allocation and consolidation and household resettlement needs in the project area.

4.2.8 Project costing and economic and financial assessment

The Consultant will cost the project and assess its economic and financial profitability. Economic prices of the project inputs and outputs shall be determined to perform the economic assessment according to the standards. The financial analysis shall be undertaken for each of the main project stakeholders: farmers, organisations managing the scheme (such as outgrowers organisations, WUAs, Apex organisation, see below). The financial model related to the Private Party in charge of O&M of the intake and feeder canal will be developed by the Transaction Advisor. In particular, the Consultant shall:

- Derive realistic construction rates for the various items of work based on rates for similar work elsewhere in the region, with a full exposition of their origin(s); This rates shall be approved by the Client before development of the full cost estimate.
- Prepare detailed bills of quantities and a cost estimate showing cost breakdown for all major works, goods and services required for the construction and implementation supervision of the proposed SVIP, including the necessary dam safety assurance works; The cost breakdown shall individualize the cost per structure and irrigation blocks.
- Make estimates of the operation and maintenance cost of the scheme for different PPP options recommended by the Transaction Advisor; these estimates will be used by the Transaction Advisor as inputs for its financial modelling.

- Compile and tabulate detailed financial cost estimates of the scheme, covering all incremental investments (capital, implementation support and replacement) and recurrent (operation and maintenance) costs, prepared using constant prices, with physical and price contingency allowances included. The cost estimates should be disaggregated into foreign and local currency components, with tax and subsidy components separately identified, and when combined they should be expressed in equivalent US dollars and be presented on an annual cash flow basis over the assumed life of the development.
- Provide to the Transaction Advisor any data related to the cost of investment and Operation and Maintenance requested for the financial model of the PPP.
- Compile and tabulate the corresponding estimated incremental direct agro-economic financial benefit streams, prepared using constant prices (or suitably applied price projections if warranted) and appropriate assumptions as to (i) likely build-up of agricultural production volumes over the years following the initial investments, and (ii) likely future agricultural production trends in a without-project situation.
- prepare detailed cost and benefit streams in financial and economic terms and carry out a financial and economic analysis of Phase I of the project using standard approaches;
- Execute financial and economic feasibility analyses in accordance with the agreed approach and methodologies, and involving iterative interactions with agricultural and engineering development plans, designs, and cost and benefit estimates, as needed or as determined by the stakeholder consultation and consensus-building process.

4.2.9 Institutional framework and price setting

Closely liaising with the Transaction Advisor and the CCP&AD team, the Consultant shall propose a comprehensive institutional set-up for the project, addressing water management in link with agricultural development and detailing for each organisation: (i) responsibilities, (ii) governance principles, (iii) financial resources and flows, (iv) modalities of representation in "upstream" organisation. This framework shall be consistent with the PPP option recommended by the Transaction Advisor.

Based on this institutional framework, the Consultant shall undertake a detailed price setting analysis for each organizational level (WUA, apex organisation), taking into account operation and maintenance costs, financial flows between levels as well as farmers' ability to pay.

4.2.10 Preparation of the Feasibility Report

The Consultant shall:

- Prepare a realistic schedule of the time required for detailed design, tender documentation, procurement and construction of Phase I, assuming that designs are prepared by consulting engineer and the works are carried out by a contractor;
- Prepare and submit a detailed report presenting the outcome of studies and major recommendations and conclusions using a template prepared by the Consultant and approved by the MoWDI;
- Submit a draft final report to the Client including the following for review and clearance which should cover main text and annexes complete with : (i) technical descriptions of all aspects of the recommended and finally agreed scheme developments; (ii) details of all data collected, surveys and investigation findings and results; (iii) details of all land and water resource, engineering, agricultural, social, environmental, and economic and financial studies, analyses, findings and results; (iv) details of stakeholder consultation, information dissemination and consensus-building activities and achievements; (v) preliminary design details and calculations; (vi) recommendations, conclusions and next steps; (vi) a time schedule for completion of detailed designs and analysis; and (vi) all maps, design calculations and other details as appropriate. Standard maps scales for general layout and drawings shall be submitted to the Client for approval before development.
- The report will clearly assess technical feasibility, economic and financial viability and environmental and social sustainability as well as O&M sustainability of the SVIP.

4.3 Stakeholder participation and information dissemination leading to consensus agreements

The study implementation shall rely on a sound and transparent participation process, based on the diffusion of pedagogic information as well as on a progressive approach: time is a major factor in successful participative design of projects.

The participation and consultation process will be implemented by the CCP&AD service provider, with the support of the Consultant through: (i) preparation of pedagogic tools (power points, maps on orthophotographs, simplified drawings, etc.), (ii) participation in the meetings, (iii) inclusion of the results of the consultation/participation process in the preliminary design.

The participation and consultation process will be organized in three major steps:
(i) Definition of the options to be assessed (stage 1 of the study), and presentation of the conclusions of the assessment;
(ii) Definition of the general layout plan of the scheme;

(iii) Presentation of the draft feasibility report

The Consultant will propose, in consultation with the CCP&AD service provider at the very beginning of stage 1, the structuration of the consultation meetings (number of meetings per consultation stages). Given the fact that there are seven traditional authorities in Chikwawa District and eight in Nsanje District, the standard set of meeting shall be at least about ten.

In parallel to these three major steps, the Consultant will also be involved in a continuous participation and consultation process for the development of the preliminary design, through frequent contacts with the stakeholders.

The consultation process related to the land resettlement and land acquisition data base will be implemented by the CCAP&AD service provider without a systematic attendance of the Consultant during meetings. However, the Consultant shall prepare specific media for this process showing on a relevant scale the project footprint on an orthophotograph, as well as easily understandable schematic cross sections and values of the structures and canals to ensure a good comprehension of the project by the stakeholders. The Consultant shall also brief and provide notes to the CCAP&AD provider in order to ensure a good understanding of the details and justifications of the project, and may participate to specific meetings with stakeholders when technical explanations are requested.

4.3.1 Definition of the options to be assessed and presentation of the conclusions of the assessment

In addition to bilateral contacts with the main stakeholders, the Consultant shall consult the farmers through an initial set of meetings organized all over the project area and aimed at introducing the participation/consultation process and listing the main options to be assessed during stage 1.

The results of the options assessment will be presented in another set of meeting at the end of stage 1.

4.3.2 Definition of the general layout plan of the scheme

The general layout out of the scheme shall be designed in a participatory way, through the organisation of several sets of meetings all around the scheme. The Consultant shall:

- study topographic maps, satellite imagery maps, other ground survey and cadastral maps to articulate and delineate preliminary proposals/scenarios for the irrigation system layout showing major canals, natural drainage ways, drainage canals and potential irrigation blocks to be used as the starting point for a participatory process for detailed irrigation system layout design. These scenarios should be based on a

phased approach and make informed recommendations on the possible phasing of the infrastructure interventions;

- with the participation of the various tiers of planning committees, facilitated by the CCP&AD Provider, carry out a step by step approach to develop the layout plan for the irrigation scheme which would eventually lead to the design of Phase I layout showing the identified irrigation blocks, irrigation conveyance and distribution systems, drainage canal system (both natural and to be constructed under the project), on-farm irrigation system, and bridges, for Phase I only;
- the methodology to discuss layout will include use of participatory methods, transect walks and use of physical models as appropriate.

4.3.3 Presentation of the draft feasibility report

The draft feasibility report will be presented to the stakeholders in a final set of meetings. The consultant shall prepare and specifically adapt communication tools for each of the areas were the meetings will be held.

The consultant shall prepare a report including the outcomes of all of the above scope of works highlighting any issues that would need to be resolved by the MoWDI/ MoAFS before proceeding with the detailed designs/documentation.

5. Steering of the study and implementation arrangements

5.1.1 Implementation arrangements and composition of review committee to monitor consultants work

The assignment shall be technically coordinated by the SVIP Task Force through the Project Coordinator (SVIP) in the Ministry of Water Development and Irrigation. The Client will be the Ministry of Water Development and Irrigation (MoWDI) represented by the Project Coordinator, SVIP, to whom the Consultant will report. The Project Coordinator will report to the Director of Irrigation Services, who in turn will report to the Secretary for Water Development and Irrigation who will chair the Project Steering Committee.

The studies will be executed within the existing institutional structures of the MoWDI which will also be responsible for the procurement of goods and consulting services.
A Study Coordination Unit (SCU) formed within the Department of Irrigation (DoI) of the MoWDI will be responsible for the day to day implementation and coordination of all the studies, including this study.

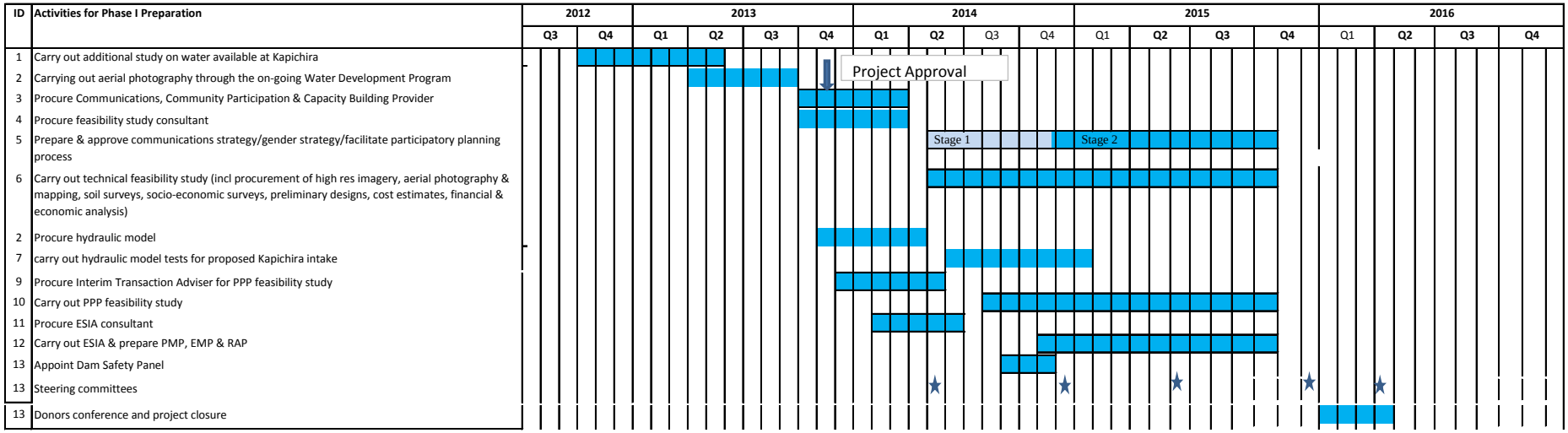
A Project Steering Committee will guide and supervise all the studies. It will be chaired by MoWDI and MoAFS with strong inclusion of the DoI of MoWDI. A technical

secretariat would serve the Steering Committee and the technical secretariat would be housed in the DoI. Its role, as the studies proceed will be to review their recommendations and to act as the decision-making body for any issues of policy that arise. A Consultative Committee will inform the Steering Committee's decisions. It shall include strong representation from the private sector, including agribusiness and the banking sector. The Consultant shall attend to the Steering Committee and Consultative Committee, at the request of the Client, and prepare dedicated presentations.

5.1.2 Interlinks with the others consultancies

The Consultant shall liaise closely with the teams in charge of the other studies, and will provide to them any data and draft output in the scope of this study that could be required to undertake their services. The proposed scheduling for all the studies to be carried is as presented in Table 1.

Table 1: Proposed scheduling of Studies



The Consultant shall liaise closely with the other study teams, and participate in coordination meetings organized by the Client.

5.1.3 Data, services, personnel and facilities to be provided by client

Documentation: the Client will provide the Consultant with relevant readily available reports and other documents related to the assignment as presented in Annex 1.

Services, Personnel and Facilities: other than providing the above-mentioned documentation, the Client will provide no services or facilities whatsoever and the Consultant will be expected to make its own arrangements for office space, equipment, telecommunications, vehicles and survey equipment. The Client will not provide any support staff or personnel other than possibly providing professional staff for on-the-job training as provided for these ToRs.

6. Study Team

The Consultant's team for the assignment is to be composed of both international/regional and local well qualified and experienced professionals. Nominated international staff should be able to provide leadership, oversight and coordination, to assure proper integration and quality of findings and results, to fill capacity gaps, and to bring advanced analytical skills and global experience to the consultancy assignment. Local staff should be able to ensure study relevance and effectiveness in the context of prevailing local conditions, and to ensure sensitivity to social and cultural aspects, as well as to assist with linguistic aspects. Their inclusion in the team would also contribute to important local capacity building and to containing study costs. Indicative key staff positions are as presented in the Table 2.

Table 2: Key staff positions

Key Position	Required Competencies
Team Leader / Water Resources /Irrigation and drainage Specialist	Postgraduate qualification in Water Resources/Irrigation and Drainage Engineering or related fields and at least 20 years of international experience in water resources development and management in which at least 10 years were related to irrigation development/management. The expert should also have prior experience as Team Leader for similar assignments in a developing country.
Irrigation and Drainage Engineer	Postgraduate qualifications in Irrigation and Drainage Engineering with at least 10 years of work experience as irrigation and drainage design engineer or bachelors degree in agricultural engineering/civil engineering with at least 15 years of solid work experience as an irrigation and drainage design engineer in large irrigation projects.
Agronomist	Postgraduate qualifications in Agronomy or Agriculture or related sciences with at least 10 years of work experience on

Key Position	Required Competencies
	irrigation development projects in developing countries
Soil Scientist	Postgraduate qualifications in Soil Science, Agronomy or Agriculture or related sciences with at least 10 years of work experience in soil investigations and analysis preferably related with irrigation development projects
Institutional development specialist	Postgraduate qualifications in sociology, legal or any relevant discipline with at least 15 years of work international experience in the Water Sector in developing countries.
Economist / Agro-economist	Postgraduate qualifications in Economics or agro-economics and at least 10 years of international experience on development projects, specifically in economic and financial analysis of water resources development (irrigation and drainage) projects.
Hydraulic Engineering Specialist	Postgraduate qualification in Hydraulic Engineering or related fields and at least 10 years relevant work experience in planning and design of hydraulic infrastructure and hydraulic modelling.
Hydrologist/ Hydro geologist	Postgraduate qualification in Water Resources Engineering /Hydrology and at least 10 years of international work experience in use of hydrological assessments and analyses.
Geographic Information System (GIS) Specialist	Postgraduate qualification in Engineering, Information Technology, Geography or related fields with at least 10 years of experience in the design and application of GIS and remote sensing techniques and proven experience in design and establishment of GIS system for development projects.
Geo-technical Specialist	Postgraduate qualifications in Civil/Geotechnical Engineering and at least 10 years of work experience on infrastructure projects, specifically for water resources infrastructure projects.
Civil Engineer	Postgraduate qualifications in Civil Engineering and at least 10 years of work experience on infrastructure projects, specifically for water resources infrastructure projects.
Social development specialist	Postgraduate qualifications in Sociology or related fields. 10 years of work experience 5 of which should be on irrigation development/management projects with experience on irrigation institutions/water user associations.
Environmental Management Specialist	Postgraduate qualification in Environmental Management or related fields and at least 10 years of international work experience in Environmental Assessments. Knowledge of Multilateral Development Banks Social and environmental safeguards is a must.

Only the competencies of the above key staff will be used in the evaluation of the proposals. However, in their proposals, consultants are free to optimize the skills in the team with justification in the proposals. The timing of the inputs for each professional member of staff shall be in line with the agreed program for service delivery. Consultants may also propose additional staff with sound reasoning and justifications,

and provided that such changes are commensurate with the required scope of services. Proposals should include an account of proposed staff assignments, their durations and schedules, and their levels of input by task. Consultants are also requested to comment in their proposals on the indicative key staff positions and inputs in relation to the overall requirements for the assignment as indicated in these ToR.

7. Tentative schedule of completion of tasks and reports

7.1.1 Tentative schedule of completion of tasks

The detailed feasibility consultant will carry out the assignment over a 18 month period from the date of the award of the contract. The Consultants shall submit a detailed plan to complete the scope of this study as a part of its proposal. The Consultant's work plan should indicate the time plan and milestones for completing major tasks described in the scope of services above and time plans for submission of progress reports, inception report, interim reports, draft final report and final report.

7.1.2 Reports

GoM will give utmost importance on timely elaboration and submission of pertinent reports during the course of the work. **All reports shall be written in English.** The draft form of all the reports shall be submitted to GoM, World Bank and AfDB for review and comments. After incorporating any requested modifications, the edited technical reports shall be simultaneously submitted in final form to GoM, World Bank and AfDB within one month after the date of reception of the comments by the Consultant.

The Consulting firm shall present the following deliverables during the contract period at the intervals stated and present the same at a public consultation and modify in the light of feedback received. The reports shall be submitted in hard copies according to the schedule and numbers as presented in Table 3.

Table 3: Schedule and number of copies of reports

Report and due date	Description	No of Copies
Inception report (Month 1 after the contract award)	The Inception Report shall be submitted **within one month after commencement of work.** It will outline the Consultant's work-plan and methodology for the study, define the study schedule by task, specify submission dates for each of the required reports in draft form, and assign the personnel by name and date period for each task. The proposed project schedule shall be	6

	broken down by task and presented in chart form in accordance with program evaluation and review technique (PERT) or any acceptable form. A meeting will be held within 1 month after receiving the report to discuss it.	
Draft options assessment report (Month 7)	Contains the outputs of stage 1, including the consultation phase.	6
Interim report (Month 14)	Contain preliminary designs and costing for development works and programs as well annexes for each of the additional investigations. A meeting will be held within 1 month after receiving the report to discuss it.	6
Draft final feasibility report (Month 16),	One report containing the feasibility and preliminary design, incorporating comments made by the Client and during the consultation phase.	6
Final Feasibility report (Month 18),	The report shall detail and discuss the study activities undertaken, output of the study, effectiveness of the study and follow up activities. The report will also contain an Executive Summary.	6
Monthly reports on Consultant's own contract 1st week of every month	1-2 pg maximum comprising a narrative and bar charts or other graphic presentation, showing details of the Consultant's progress, changes in the assignment schedule, impediments and proposed remedies will be submitted on a monthly basis.	6

Other Deliverables	Description	
	Topographic Maps for the project area	
	Aerial Photography and Mapping	
	Geotechnical investigation report	
	GIS for the project Establishment with metadata base	
	Soils and Land Use Report	
	Socio-economic report	

The Consultant shall also be required to submit the reports in acceptable electronic format.

ANNEX 1: LIST OF REPORTS

(i) Hunting Technical Services Ltd (1980) *National and Shire Irrigation Study*. Final Report
(ii) SOGREAH-BCEOM (1992). Shire Valley Irrigation Project Detailed Design Report (incomplete copy).
(iii) CODA (2005-2008). *Various feasibility and design reports* (incomplete copies).
(iv) Coyne et Bellier (2010). Shire Valley Irrigation Project: High level Canal Project Review Report.
(v) BRL Ingénierie (2011). Public Private Partnership Options Study and Awareness Raising for Irrigation Investment in Malawi. Final Report.
(vi) Atkins (2011). Water Availability on the Shire River at Kapichira Dam for the Proposed Shire Valley Irrigation Project.
(vii) African Water Facility (2012). Malawi: Prefesaibility Report on the Shire Valley Irrigation Project.
(viii) Norplan (April, 2013) Study on Water Availability for Irrigation and Hydropower Production on Shire River at Kapichira Falls. Final Report

In addition, the following reports could also be made available:

(a) Irrigation and Health Planning Study, Irrigation Department, 2001.

(b) Irrigation and Environmental Planning Study, Irrigation Department, 2001

(c) Socio-Economic Aspects of Irrigation Technologies, Irrigation Department, 2001

(d) Malawi Irrigation Schemes Viability Study–Smallholder Flood Plain Development Project (SFPDP), Omega K. Consulting, 2004,

(e) Water Resources Assessment Study – SFPDP, 2002

(f) Water User Association Training Modules - IRLADP

(g) Study on Capacity Building for Smallholder Irrigation Development – JICA, 2005.

(h) Environmental Impact Assessment Guidelines for Irrigation and Drainage Projects in Malawi; By GOM, 2002

(i) Informal Irrigation in Lake Chirwa Basin: Stream Banks and Wetland Gardens, Pauline E. Peters, BASIS-Harvard Study, November 2004.

(j) Final Research Report: Irrigation Reform on Malawi's Domasi and Likangala Smallholder Irrigation Schemes - Exploring Land – Water Intersections. A.E. Ferguson, Michigan State University, W.O. Mulwafu, Chancellor College UNIMA, Oct 2004.

(k) Preliminary design report of Diamphwe Dam (Sogreah, 2012).

(l) Environmental Screening Forms

Annex 6- Communication and AWF visibility guidelines

To AWF, brand visibility and communication greatly matter. Both visibility as well as steady and clear communication help build brand recognition, reputation and credibility through improved understanding of the AWF's mission and accomplishments. For a Special Fund entirely financed by donor contributions, image is key for keeping donors' trust and for attracting new ones. AWF donors and stakeholders expect contributions to be used to catalyze the development of the water sector in Africa through strategic projects expected to prepare investment projects, enable water governance and promote water knowledge, and they want evidence of it.

While AWF engages in reporting activities aimed at communicating its progress in all three areas, it is also important to broaden efforts to show its presence and contribution to the water sector in Africa by being more clearly associated with the projects it supports. The collaboration of AWF Grant Recipients (referred to as Recipient below) is instrumental in achieving this objective.

To that effect, the AWF has established visibility guidelines to help Recipients properly acknowledge AWF's contribution.

NOTE: *These guidelines are subject to negotiation between AWF and the Recipient to adapt to the reality of the Recipient and possible constraints that could prevent the Recipient from complying.*

GENERAL REQUIREMENTS

• At an early stage in the preparation process for communication activities, contact the Communication Officer at AWF Secretariat, copying the AWF Project Manager.

• At a minimum, and wherever possible, the AWF logo should be applied to all outreach materials. The proper use of the logo should be discussed with the AWF Communication Officer.

• The AWF should be verbally mentioned as donor of the project it is funding at public speaking events where the project is discussed, and also be mentioned as donor in any Power Point presentations relevant to the project funded by the AWF, using the name and the logo of the AWF appropriately.

• The logo is to be obtained upon request from the AWF Communication Officer.

• Documents and publications should contain the AWF logo, as well as this phrase on the cover page: "This project/program/study is funded by the African Water Facility".

• Implementing and executing agencies should always have a link to the AWF website on the page of their website relevant to an AWF-funded project/activity. The website is: www.africanwaterfacility.org

VEHICLES, SUPPLIES AND EQUIPMENT

•AWF generally requests that vehicles, supplies and equipment funded by AWF be clearly identified, and visibly carry the AWF logo and the phrase "Provided with the support of the African Water Facility" in English, French or Portuguese, as relevant.

•This requirement is subject to negotiation between AWF and the Recipient as some supplies and equipment may be exempt.

•The Recipient must provide evidence of compliance with this rule (digital photos sent by email are recommended.)

PRESS RELEASES & MEDIA ADVISORIES

• The AWF encourages and appreciates initiatives to issue joint press releases with its partners. A standard joint press release should be issued at least i) at the launch of the project at a time agreed by the AWF and the Recipient, and if possible ii) at project completion.

• When the Recipient wishes to produce a press release, liaising with the AWF Communication Officer is required, as well as receiving a quote from the AWF Coordinator, as appropriate, and getting approval and clearance.
• The AWF should be included in the title and/or first paragraph of the press release, as appropriate.
• The press release should incorporate the AWF logo, mention that funding was provided by the AWF, and mention the amount of AWF funding.
• If a press conference is planned, the press release should include the name of an AWF senior representative who will be present at the press conference, when relevant.
• All press releases must bear the name and contact information of the AWF Communication Officer along with the communication/media representative from the Recipient.
• The AWF boilerplate text ("About the AWF") must be added to the text, including the AWF web site address.
Boiler plate as at August 2012*:

About the African Water Facility (AWF)

The AWF is an initiative of the African Ministers' Council on Water (AMCOW) hosted by the African Development Bank (AfDB), established in 2004 as a Special Water Fund to help African countries achieve the objectives of the Africa Water Vision 2025. The AWF offers grants from €50,000 to €5 million to support projects aligned with its mission and strategy to a wide range of institutions and organizations operating in Africa. Its three strategic priority activities are (1) **preparing investment projects** to mobilise investment funds for projects supported by AWF; (2) **enhancing water governance** to create an environment conducive for effective and sustainable investments; (3) **promoting water knowledge** for the preparation of viable projects and informed governance leading to effective and sustainable investments. Since 2006, AWF has funded 73 national and regional projects in 50 countries, including in Africa's most vulnerable states. It has mobilized more than € 420 million as a result of its project preparation activities, which constitute 70 percent of its portfolio. On average, **each €1 contributed by the AWF has attracted € 20** in additional follow-up investment. The AWF is entirely funded by Algeria, Australia, Austria, the Bill and Melinda Gates Foundation, Burkina Faso, Canada, Denmark, the European Commission, France, Norway, Senegal, Spain, Sweden, the United Kingdom, and the African Development Bank. For more information, visit www.africanwaterfacility.org

*This text is updated once or twice a year.

• The rules above also apply to media advisories.

PRESS CONFERENCES

• Press conferences to launch projects funded by the AWF should be organized in cooperation with the AWF, as much as possible.
• The invitations should bear an AWF logo.
• The AWF logo of a visible size should appear on any banner or poster to be displayed at the site of the conference.
• Press kits need to include a press release with the AWF logo.
• Whenever possible an AWF banner should be on hand and set up to serve as a backdrop for TV and photo purposes.

PRESS VISITS

• When appropriate, journalists should be invited to visit the project funded by AWF, accompanied by representatives of the AWF or the AWF Focal Point in the respective authority / government of the Recipient.

VISITS BY GOVERNMENT OFFICIALS, AWF DONORS

• Visits to projects by government officials and AWF donors are encouraged. Those should be prepared in coordination with the AWF and the AWF Focal Points of the host government. This can include meetings with local beneficiaries.
• These visits may also include government officials and AWF donors' participation to round tables and other events, as relevant.

LEAFLETS, BROCHURES AND NEWSLETTERS

• All leaflets and brochures relevant to the project/program financed by AWF should incorporate the basic elements of the AWF visual identity, i.e. the AWF logo -with or without tagline.
• Leaflets and brochures produced by a Recipient must also incorporate a definition of the AWF (boilerplate text).
• The cover page of all documents pertaining to the project financed by the AWF must clearly identify the activity as being part of an AWF-funded activity.
• Copies, including electronic copies of the publications, should be made available to the AWF.

ELECTRONIC COMMUNICATION

•Electronic communication disseminating information on AWF-funded projects including websites, newsletter, and social media, should link to the AWF website.

SIGNAGE

• The Recipient should produce display panels, posters or banners to promote their AWF-funded or AWF-related activities at exhibitions and other events, placed in strategic locations for all to see.

PHOTOGRAPHS AND AUDIOVISUAL PRODUCTIONS

• Professional high resolutions (300 Dpi) digital photographs of the project funded by AWF should be supplied to the AWF throughout the different phases of the project, to document the progress of actions and events related to these, and to be used in print and online publications.
• All photos should be submitted with full caption and credit information.
• The AWF will be entitled to use or reproduce photos submitted to it without payment of royalties.
• Whenever relevant, audiovisual materials should acknowledge AWF support, by featuring the AWF logo at the beginning and/or end of the movie/documentary.
• Copies of the movie(s) / documentary (ies) should be supplied to the AWF.

COMMEMORATIVE PLAQUES OR SIGNAGE

•Whenever relevant, the Recipient should place a permanent plaque, or some other type of large, commemorative signage in the most visible part of the building, infrastructure or nearby the project site, which received funding by AWF, beside the name of the implementing agency and/or name of the project, for visitors to see.
•When appropriate, the plaque or signage could contain the following sentence: “This [name of the infrastructure] was funded by the African Water Facility” alongside the AWF logo.

PROMOTIONAL ITEMS

• Before taking any decision on the production of such items, the Communication Officer at the AWF should be consulted.
• Promotional items bearing the AWF logo can be distributed to support communications activities related to the project funded by AWF. This may include T-shirts, caps, pens, notebooks, USB keys etc.