

**PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE**

Report No.: AB5365

Project Name	Malawi: Shire River Basin Management Project
Region	AFRICA
Sector	Forestry (30%); General agriculture, fishing and forestry sector (30%); General water, sanitation and flood protection sector (20%); Public administration - Water, sanitation and flood protection (20%)
Project ID	P117617
Borrower(s)	GOVERNMENT OF MALAWI
	Government of Malawi Malawi
Implementing Agency	
	Ministry of Natural Resources, Energy and Environment Malawi
	Ministry of Agriculture and Food Security Malawi
	Ministry of Irrigation and Water Resources Malawi
	Ministry of Transport and Public Works Malawi
	Department of Disaster Management Affairs Malawi
Environment Category	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
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1. Key development issues and rationale for Bank involvement

Country Context

Malawi is one of the world's poorest countries. Malawi is ranked 164 out of 177 countries on the United Nations Human Development Index for 2007/08 with an estimated GNP per capita of US\$160. Approximately 65 percent of the population lives below the national poverty line. Malawi is a landlocked country with a land area of 118,484 square kilometers and a population of 13.1 million that is expected to grow to 20 million by 2025. It is one of Southern Africa's most densely populated countries. The

environment and natural resources base play an important role in social and economic development at both the household and national level. Approximately 80 percent of Malawians depend on renewable natural resources for their subsistence and household income, and the foundation of the national economy is primarily rain-fed agriculture.

Malawi has recently registered high economic growth rates, following a history of volatile and low growth. GDP growth between 2006 and 2008 was high, averaging 8%. Growth for 2009 is projected at 8%. This performance is anchored by strong growth in agriculture (particularly smallholder agriculture), construction, finance, insurance and information and telecommunications. Improved macroeconomic management, good weather and a supportive donor environment have helped stimulate economic growth. Inflation has remained in the single-digits since 2007, averaging 9% in 2008. In May 2009, the Democratic Progressive Party was re-elected for a second five-year term, largely on account of the improved macroeconomic performance, a successful agricultural input subsidy program and promises for further economic development. However, prior to 2007, macroeconomic management was weak. Together with the country's dependence on rain-fed agriculture, and highly concentrated exports, growth had generally been low and volatile. Between 1999 and 2004, average growth per annum was only 2%. Despite recent progress, Malawi still faces significant challenges that may hamper sustained growth and development, including constraints in the agriculture and energy sectors and the adverse economic, social and environmental impacts of floods and droughts.

Agriculture is the single most important sector of the economy accounting for over 80% of total export earnings (tobacco, tea and sugar alone), between 35 - 40% of GDP and over 80% of the workforce. However, agriculture is highly susceptible to drought, climate variability, and land degradation (experienced as soil erosion, soil fertility loss, and deforestation). The sector is characterized by over dependence on rain-fed farming, low level of irrigation development, soil nutrient mining, and low uptake of improved farm inputs.

Current installed hydropower capacity is 285 MW. However, less than 260 MW is reliably available at peak times owing to several environmental factors. Currently, only four percent of the population has access to electricity. Thirty percent of urban households and 0.5 percent of rural households have access to electricity. Ninety-eight percent of current generation is from run-of-river plants on the Shire River¹. The planned expansion of domestic generation capacity would further increase Malawi's dependence on the Shire River for electricity generation. However, available power generation capacity has been well below installed capacity and unable to meet peak demand owing to frequent equipment breakdown and environmental factors such as sedimentation and increasing aquatic weed growth². Aquatic weeds harmful to power generation plants have increased significantly in the last 50 years.

Droughts and floods have had a devastating effect on crop and livestock production. Between 1967 and 2003 the country experienced six major droughts that had a cumulative impact on 21 million people³. The impacts of drought are felt mainly by smallholder farmers who are least equipped to deal with such events. For example, crop failure in the 2001/2002 growing season due to drought was estimated at \$150 to \$180 million. Floods are also common in Malawi. Eighteen floods occurred

¹ "Run-of-river" means that there is little or no capacity to store and control the flow of water upstream of the power generation stations, so the amount of electricity that can be produced is dependent on the daily flow of the Shire River. Heavy siltation has reduced the already small capacity of the reservoirs intended for daily storage.

² For example, the Tedzani I & II plants were taken out of service in 2001 due to damage resulting from flooding of the river, and are yet to be restored.

³ Emergency Disasters Database, www.em-dat.net.

between 1967 and 2003 affecting 1.8 million people. Floods have resulted in loss of life, severe crop loss, infrastructure destruction (including roads, rail and homes), food insecurity, and health impacts (diarrhea, cholera and malaria). Droughts, floods and rainfall variability trigger risk-averse behavior by farmers leading to low productivity and by investors in agriculture, industries and services slowing diversification of economic activities.

The adverse economic, social and environmental impacts of these challenges are particularly acute in the Shire River Basin. Given the economic and social importance of the Basin for national growth and development, it is critical to address the root causes of the deteriorating environment and natural resources base in the basin to ensure sustainable growth and poverty reduction.

The Shire River Basin

The Lake Malawi-Shire River hydrological system represents Malawi's single most important natural resource system that supports significant economic and social activities. The Shire provides water for a number of productive purposes, including: more than 95% of Malawi's hydroelectric power generation, agriculture (e.g., small and large scale irrigation schemes in the Lower Shire such as Malawi's largest agricultural company, Illovo Sugar), fisheries (particularly in the Lower Shire where fisheries are an important source of protein and supplemental rural income), transport, tourism, urban water supply (90% of the water supplied to Blantyre and district capitals originates from the Shire) and rural water users along the length of the river, in addition to various environmental functions.

The Shire River originates at Lake Malawi, flowing south and south-east to the confluence with the Zambezi River. Downstream of Lake Malawi, for the first 80 km, the river flows down across a flat landscape which runs north-south in a 15-35 km wide trough. From there it flows south-east to the confluence with the Zambezi River. Large expanses of cultivated land characterize the catchment. The Middle Shire drops over 370 m. This section contains a series of falls⁴. The Lower Shire widens into the flat alluvial plain and hosts large areas of commercial agriculture (sugar), while the lower areas are dominated by the seasonally flooded Elephant Marsh with its small scale agriculture, artisanal fisheries, and important flood attenuation characteristics.

Over the last twenty years the Shire River Basin has experienced some of the worst droughts (1991/92, 2004, 2005) and floods (2000/01). During the last two decades, the Basin has experienced significant changes in weather patterns, ranging from severe drought conditions in 1991/92 to extreme flooding events with flash floods in 2000/01. These events caused significant damage to crop and livestock production, the environment and rural communities. The main impacts of flooding are loss of life, damage to property and transport infrastructure, impeding drainage of agricultural lands, crop damage, and disruption of other important socio-economic and industrial activities. More than half a million people living in the Lower Shire Valley⁵ are vulnerable to climatic extremes such as droughts and floods.

Deforestation, soil erosion and sedimentation continue to be the most serious threats to the environment and natural resource base in the Shire River Basin. Malawi has a high diversity of soils and land forms. Important habitats include mopane woodlands, riparian thicket, grasslands and marsh. The

⁴ Kholombidzo, Nkula, Tedzani, Hamilton and Kapichira.

⁵ Flooding problems in the Lower Shire River and the Ruo River, specifically, are caused by high intense rainfall in the Mulanje and Thyolo areas coupled with the steep gradient slopes of the Mulanje massif and Thyolo Escarpment. Flash floods occur in all tributaries in increasing frequency due to loss of land cover, raising of river beds and loss of natural wetlands. Some backwater from flooding in the Zambezi also compounds the problem.

Upper, Middle and Lower Shire are important areas for crop production and conservation of forests and wildlife. The Upper and Middle Shire catchments are an important source of forest products for rural communities. The flood plains, wetlands and forests of the Lower Shire Valley are important habitats for wildlife and crop production (rice, cotton, beans, sorghum, millets and sugar cane). There are also several regionally important wetlands and marshes in the Shire Basin. However, unequal land distribution (more than 40% of smallholder farmers cultivate on less than 0.5 hectares) coupled with increasing population pressure have led to overexploitation of the limited natural resource base and severe deforestation of upper catchments and riverbanks, which together with the limited adoption of land and water conservation techniques have increased the incidence of erosion, run-off and flash floods across the Basin; carrying high loads of sediment that are raising river beds, deposited in reservoirs and flood plains affecting irrigation canals, fisheries and hydro power generation; exacerbating problems on site and downstream.

Water resources in the Shire River Basin are becoming increasingly degraded through sedimentation, eutrophication, biological contamination and effluents. Silt loads in surface water runoff leads to significant problems in water quality, including turbidity and water flow problems, and increases water treatment costs. Some tributaries of the Shire pass through heavily cultivated areas, townships and cities, resulting in water pollution from human and industrial waste, contributing to increased concentrations of nitrogen, phosphorus and heavy metals in water resources that generate adverse impacts on human health and accelerate growth of aquatic weeds. The problem of siltation and aquatic weeds on the Shire are a direct result of watershed degradation, unsustainable land use and management practices and increased use of chemical fertilizers without complementary soil conservation measures.

To address these challenges, the Government of Malawi has requested Bank assistance to prepare a comprehensive watershed management program for the Shire River Basin.

Rationale for Bank Involvement

The Malawi Growth and Development Strategy (MGDS, 2006 - 2011) emphasizes sustainable economic growth. Specifically, the MGDS emphasize six focus areas: agriculture and food security; irrigation and water development; infrastructure development; energy generation and supply; integrated rural development; and HIV and AIDS prevention and management. The proposed program is consistent with country priorities and builds on existing investments, policies and political commitments identified in the MGDS.

The MGDS outlines ambitious plans to stimulate economic growth and development including a series of large-scale infrastructure investments in the Shire River Basin (i.e., large scale smallholder commercial irrigation, upgrading of hydropower plants, restoration of transport links, flood mitigation works and mining). Such large scale investments may generate long-term and cumulative adverse environmental, social and economic impacts if the interlinked challenges of increasing population pressure on a degraded natural resources base, declining agricultural yields, rapid urbanization (driving demand for charcoal), unreformed land ownership and weak institutional capacity to promote sustainable land and water management are not addressed in an integrated, multi-sector fashion. The proposed Shire River Basin Management Program is designed to address these challenges in a comprehensive manner.

The Bank has a long history of engagement with the Government of Malawi supporting a number of investments in the Shire Basin in the agriculture, energy, environment, irrigation, transport and water sectors as well as important interventions on Disaster Risk Reduction. Building on these investments, the opportunity to support the Government of Malawi to adopt a comprehensive and integrated planning and development approach for the Shire River Basin will not only enhance the impact of these earlier investments but ensure the long-term sustainability of the Government of Malawi's ambitious investment plans in the Basin.

The proposed project is consistent with the World Bank's fourth Country Assistance Strategy for Malawi, 2007 – 2010. The project focuses on safeguarding and ameliorating the environment and natural resource base in the Shire River Basin to ensure improved and sustainable livelihoods, food security, water supply and electrical energy generation; essential elements to support sustainable economic growth and poverty alleviation efforts. Project investments are well aligned with the first two CAS pillars, namely: i) Improve smallholder agricultural productivity and integration into agro-processing; and, ii) Put in place a foundation for long-term economic growth through improved infrastructure and investment climate. The program is also fully aligned with the multi-sector approach currently under development for the fifth Country Assistance Strategy.

2. Proposed objective(s)

The overall program development objective is to make significant progress in achieving socially, environmentally and economically sustainable development in the Shire Basin. To achieve this objective, the APL will: (i) support establishment of a basin level planning, management and development system for the Shire River Basin; (ii) prepare and implement investments to accelerate sustainable growth in an integrated manner; (iii) support efforts to reduce erosion and sedimentation in priority catchments, together with enhanced agricultural productivity; and, (iv) improve water resources management and development in the basin.

The specific Project Development Objective (PDO) in support of the first phase of the program is to develop a strategic planning and development framework for the Shire River Basin and support targeted investments to improve land and water resources management in the basin.

The proposed project results indicators are:

- Initial Shire River Basin management plan prepared and an institutional mechanism for Shire River Basin management agreed;
- Increased adoption of sustainable land and water management practices in select catchments;
- Kamuzu Barrage rehabilitated;
- Preparatory studies conducted for water and flood management related investments in the Shire River Basin.

3. Preliminary description

The Project will address the interlinked challenges of poverty and a deteriorating natural resource base in the Shire River Basin to halt the process of environmental degradation and improve the productive potential of natural resources. The Project will promote integrated climate resilient investment planning in the basin, including institutional capacity building to plan and monitor changes in land use patterns at a basin level. Project activities will support strategic planning of large-scale infrastructure investments and adoption of sustainable land, forest and water management practices to reduce land degradation in production landscapes and improve the productivity and incomes of smallholder farmers. Project investments will be designed to support the Government of Malawi's economic growth and development plans in the basin.

The Project is organized in three components: (i) Institutional Capacity Strengthening for Basin Planning, Management and Development; (ii) Livelihoods-Based Watershed Management; and, (iii) Infrastructure Development to Mitigate the Impacts of Floods and Droughts to Support Sustainable Economic Growth and Food Security.

Component A: Institutional Capacity Strengthening for Basin Planning, Management and Development (US\$15 million) The objective of this component is to support establishment of the Shire River Basin management institution to promote harmonized watershed development interventions and policies for the basin. The institution will coordinate public as well as private sector interests in its strategy formulation exercise.

Specifically, this component will invest in institutional capacity building for river basin and watershed management and support strategic planning and preparation of significant infrastructure investments within an integrated and sustainable basin development framework. Elements included under this component are:

- a. **Strengthen capacity for basin management.** This activity would help create the enabling environment for improved basin planning, development, and management. It will support building a sound knowledge base and analytical tools for basin planning and management; including enhanced forecasting and management of floods and droughts.

This work will be targeted at building basin planning and management capacity in the Shire River Basin management institution and include support for:

- Water and land monitoring, including: hydro-meteorological, land use, forest cover, sediment/watershed degradation, and water quality aspects, using both ground-based and satellite systems. This work will build on existing systems such as the web-based GIS watershed maps developed during project preparation.
- Development of suitable models (e.g. simulation, optimization, multi-criteria) for basin planning and operational management and examining scenarios of development and climate variability and change. These tools will be used to help examine water resources availability and sustainability of large-scale water

and land related infrastructure investments, improve flood and drought forecasting and management, and improve water infrastructure operations.

- Structured stakeholder involvement and outreach to improve use of monitored information and to better customize analytical frameworks and outputs.

This activity will provide financing for monitoring and communication systems, related IT and office equipment, data development, and related consultancies and training.

- Support strategic planning of large-scale infrastructure investments within an integrated basin approach** (e.g., Shire Valley Irrigation Project, multipurpose storage dams as identified and designed under the National Water Development Project II, NWDP, and major transport and energy investments) and prepare for these investments applying a coherent and sustainable basin development framework.
- Embed general project management functions with broader institutional capacity building efforts aimed at promoting harmonization of policies and strategies for basin planning, management and development in accordance with best practice.**

Component B: Livelihoods-Based Watershed Management (US\$25 million) The objective of this component is to build local capacity and pilot rehabilitation of degraded upper watersheds in select catchments through a participatory livelihoods-based approach to encourage rural communities to manage natural resources sustainably. Specific activities supported under this component would include:

- Pilot adoption of community-based sustainable land and water management practices in priority catchments to reduce land degradation and increase soil productivity and rural incomes based on a menu of options packaged as an integrated set of interventions for each targeted area**, including: i) reforestation to decrease soil erosion and sedimentation of rivers (e.g., Mwanza, Rivi Rivi, Ruo and Lisungwe) that deposit significant amounts of sediment in the Shire; ii) adoption of new agronomic practices, crop diversification into high-value crops and reduction of post-harvest losses; iii) rainwater harvesting and mini-scale irrigation; and, iv) improved land conservation techniques to reduce run off and improve water retention and soil fertility. Soil and water conservation interventions will be area specific (guided by spatial maps), need-based and identified for specific priority catchments where ownership and the potential for impact are deemed high.
- Specific catchments (e.g., Mwanza, Ruo) will include forest sector interventions (e.g., reforestation, fire management, pilot Carbon finance opportunities) and measures to reduce the gap between biomass production and consumption** (i.e., promoting establishment of community plantations in degraded areas on customary land; thereby helping communities gain access to sustainable timber, pulpwood, firewood, minor forest produce and cash).

The Shire River Basin stocktaking analysis and Strategic Environmental and Social Assessment (SESA) are among the tools that will be used to identify priority catchments for

component interventions. Lessons learned from the Irrigation, Rural Livelihoods and Agricultural Development Project (IRLAD) will assist in the identification of the most effective technologies already tested in the basin. And, in the Lower Shire, in particular, investments will complement early successes in community catchment conservation promoted by the IRLAD Project⁶.

Component C: Infrastructure Development to Mitigate the Impacts of Floods and Droughts to Support Sustainable Economic Growth and Food Security (US\$30 million) The objective of this component is to mitigate risks posed by droughts and floods and to reduce the uncertainty of access to water due to rainfall variability. This component builds on important advances made by the Second National Water Development Project (NWDP II) and Bank supported Disaster Risk Reduction work.

This component would support two lines of intervention, namely:

- a. **Upgrade Kamuzu Barrage at Liwonde.** Flow in the Shire River is largely determined by the water level in Lake Malawi⁷. The Kamuzu Barrage at Liwonde regulates the natural fluctuations of Lake Malawi within set boundaries, thereby regulating the flow of the Shire River so that generation of hydro-power downstream is not affected. Building on the detailed design work, Environmental Impact Assessment (EIA) and Social Assessment (SA) financed by the Second National Water Development Project, this component will finance rehabilitation of the Kamuzu Barrage, including a better operating system for managing lake flows based on real time meteorological and hydrological data. Rehabilitation of the Kamuzu Barrage will increase the capacity to regulate water flows from Lake Malawi into the Shire River. Regulating the flow of the river benefits the cities of Blantyre and Limbe (urban and industrial water supply), irrigation, fisheries and important ecosystems including protected areas in the Middle and Lower Shire. Studies have shown that better lake level control can eliminate the risk of the river going dry in all but the most severe drought sequences.
- b. **Identification of priority multi-purpose investments for initial preparation and financing of full feasibility studies, preliminary design, environmental impact assessments and safeguard plans for the selected works.** Floods in the Lower Shire have significant economic and social implications. Although moderate flooding that coincides with high seasonal rainfall can be important for maintaining riverine systems and highly productive fisheries, excessive flooding can be destructive to infrastructure and requires a range of interventions to mitigate the impacts of floods to improve rural livelihoods and sustain economic growth and diversification. The sediment and flooding challenges are interrelated and require a range of interventions including both physical and nonphysical measures such as flood protection works, an early warning system and a flood plain management plan. Selection of priority investments and associated flood management planning would be based on the recently completed Disaster Risk Reduction Situation Analysis, Economic Vulnerability and Disaster Risk Assessment study and Flood Risk Study for the Lower Shire. Such investments complement the emerging

⁶ Specifically, by focusing Component investments on the Thyolo escarpment to ensure sustainability of soil conservation measures adopted by IRLAD in the Chikwawa District.

⁷ During the mid-1990s, water levels were at their lowest in 60 years, resulting in low flow in the Shire and power shortages. Between 1915 and 1935, the Shire's flow ceased entirely due to low lake levels in the river. Cessation of flow in the Shire River today would result in significant social, environmental and economic impacts given Malawi's reliance on the Shire River.

work under the National Program to Manage Climate Change in Malawi as well as preparation of the Disaster Risk Management Plan for Malawi and the Integrated Disaster Management Plan for the Lower Shire. Actual investments would be financed under the second phase of the proposed APL.

Project Implementation and Coordination Arrangements

Given the complexity and multi-sector nature of the proposed operation, and subject to discussion with the Government of Malawi and Bank management, it is proposed that a multi-sector Project Management Unit (PMU) be housed in the Ministry of Natural Resources, Energy and Environment staffed with experts from the relevant line ministries and specialized departments (e.g., Department of Disaster Management Affairs, DoDMA) for coordination and implementation of specific project interventions.

To ensure broad government ownership and long-term leadership of the APL, and to support cross-sector coordination, the project would also establish a Project Steering Committee (PSC) chaired by the Principal Secretary of the Ministry of Development Planning and Cooperation. The PSC would have general oversight of the project. It would be comprised of representatives from the Ministry of Natural Resources, Energy and Environment, the Ministry of Agriculture and Food Security, the Ministry of Irrigation and Water Resources, and the Ministry of Transport and Public Works, among others, engaging the Departments of Energy, Environmental Affairs, Forestry, Irrigation, Land Resources and Conservation, Mines, Meteorology, Transport, Water Resources and Disaster Management Affairs⁸. The PSC would be responsible for general policy making, approval of annual work plans and budgets, review of quarterly and annual implementation progress reports, including audit reports, and inter-ministerial coordination.

A Technical Committee (TC) would be established and responsible for providing technical oversight of project implementation as well as reviewing and recommending project work plans and budgets to the PSC. The TC would also advise on the quality of implementation reports and policy documents, guidelines and M&E reports. This committee would be comprised of senior technical staff of the principle line ministries involved in project implementation as well as other units (e.g., DoDMA) and external experts.

At the local level, the District Assemblies, in close cooperation with communities, would hold primary responsibility for implementing the pilot sustainable land and water management activities proposed under Component B. The PMU would facilitate development of catchment plans in collaboration with the District Assemblies (DA) and communities. The specific activities derived from the catchment plans would then be implemented by the DA and involve key departments from relevant line ministries in identification, planning and implementation. All activities would be community-based.

Formal partnership arrangements will be established during project preparation with the Millennium Challenge Corporation/Account (MCC/MCA), UK Department for International Development (DFID), Norway and the United Nations Development Program (UNDP), among others, who are actively investing in watershed management activities in the Shire River Basin. The vast majority of

⁸ Coordinates disaster related activities in the country headed by the Commissioner for Disaster Preparedness, Relief & Rehabilitation and through the National Disaster Preparedness and Response Committee (NDPRC) reports to the President through the Chief Secretary who chairs the Cabinet Committee. Line Ministries, NGO, International Agencies and Specialist Committees such as MVAC sit on the NDPRC.

development partners welcome the proposed approach for basin level planning, management and development through a basin management institution.

4. Safeguard policies that might apply

[Guideline: Refer to section 5 of the PCN. Which safeguard policies might apply to the project and in what ways? What actions might be needed during project preparation to assess safeguard issues and prepare to mitigate them?]

The proposed operation would be classified as a Category A project given the nature of some of the proposed investments (e.g., Kamuzu Barrage) and scope of the overall program with respect to developing future large-scale infrastructure investments and influencing land use planning in the Basin. Specific World Bank safeguard policies applicable to the APL would be:

Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)	x	
Natural Habitats (OP/BP 4.04)	x	
Forests (OP/BP 4.36)	x	
Pest Management (OP 4.09)	x	
Physical Cultural Resources (OP/BP 4.11)	x	
Indigenous Peoples (OP/BP 4.10)		x
Involuntary Resettlement (OP/BP 4.12)	x	
Safety of Dams (OP/BP 4.37)	x	
Projects on International Waterways (OP/BP 7.50)	x	
Projects in Disputed Areas (OP/BP 7.60)		x

The Ministry of Natural Resources, Energy and Environment, through its Environmental Affairs Department, is responsible for management of environmental considerations, including environmental assessment work. However, Malawi is considered to have weak institutional capacity for safeguard policy implementation and monitoring, particularly at the local level. As such, the Borrower will prepare the requisite safeguard policy tools, as per Bank policy, to minimize and mitigate all potentially adverse environmental and social impacts generated by the specific investments financed by the APL. In addition, the institutional capacity to apply the project's safeguard policies and tools will be enhanced through targeted training for central, regional and local level stakeholders tasked with application and monitoring of the project's safeguard policies and tools throughout project implementation.

5. Tentative financing

Source:	(\$m.)
BORROWER/RECIPIENT	0
International Development Association (IDA)	70
Total	70

6. Contact point

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