

**INTEGRATED SAFEGUARDS DATA SHEET
CONCEPT STAGE**

Report No.:

Date ISDS Prepared/Updated: 05/14/07

I. BASIC INFORMATION

A. Basic Project Data

Country: Kenya	Project ID: P106636	
	Additional Project ID (if any):	
Project Name: Sondu Miriu Hydro Power Project		
Task Team Leader: Karan Capoor		
Estimated Appraisal Date: 06/15/2007	Estimated Board Date: 06/29/2007	
Managing Unit: AFTEG	Lending Instrument: Emission Reduction Purchase Agreement	
Sector: Energy		
Theme:		
IBRD Amount (US\$m.):		
IDA Amount (US\$m.):		
GEF Amount (US\$m.):		
PCF Amount (US\$m.):		
Other financing amounts by source:		
Environmental Category: B		
Simplified Processing	Simple <input type="checkbox"/>	Repeater <input type="checkbox"/>
Is this a transferred project	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

B. Project Objectives [from section 2 of PCN]:

Power demand in Kenya has risen considerably owing to the country's improved economic growth in the last two years. The recorded peak demand has reached almost 920MW leaving the reserve margin between supply and demand at barely 100MW. This margin is far below the recommended 15% to allow for any plant outage which is required during maintenance.

Further, with the ongoing power system reinforcement and the accelerated customer creation strategy by Kenya Power and Lighting Company Ltd. (KPLC), demand is projected to rise at an average of 150MW per year. With this rising demand, the reserve margin will continue to drop significantly with the consequence of power rationing during peak hours.

Sondu Miriu Hydro Power Project has been developed by KenGen (Kenya Electricity Generating Company Ltd.) the major supplier of electricity in Kenya, contributing about 85% of all power consumed in the country. The objective is to utilize water from Sondu Miriu River to generate electricity, thus generating more renewable energy for sale to KPLC on the basis of a power purchase agreement (PPA).

In addition to meeting demand for power, the project contributes to the sustainable development of Kenya by:

- a) Assisting KenGen to use thermal plants only for stand-by power generation, thereby displacing expensive heavy fuel, diesel, coal and gas-fired generation, thus reducing local and CO₂ emissions to the atmosphere by generating energy without GHG emissions¹ and without the sulfur dioxide and particulate matter that is emitted by fossil fuel plants.
- b) Employing local labor in construction and plant management.
- c) Contributing to Kenya's fiscal revenues through the payment of taxes², and reducing the need for the use of valuable foreign currency to import fossil fuels.
- d) Increasing the number of clean energy projects in the country.

C. Project Description [from section 3 of PCN]:

The Sondu Miriu Power Project is in Nyanza Province about 60 km south of Kisumu. It is based on a run-of-river diversion from the weir structure on the Sondu Miriu River above the Nyakach Escarpment. The weir structure is about 70 meters across and 18 meters high. The power plant will have two generating units with a capacity of 60MW and an estimated annual generation of 330 GWh. It will supply electricity to the national grid, with an expected start date of November 2007.

The water from the intake weir will be conveyed via a 6.2 km underground tunnel before dropping to the power station via a 1.2 km penstock. The tail water will pass through an open channel for a distance of about 5 km to the proposed 20 MW Sang'oro power plant before discharging back to the Sondu Miriu River.

D. Project location and salient physical characteristics relevant to the safeguard analysis (if known):

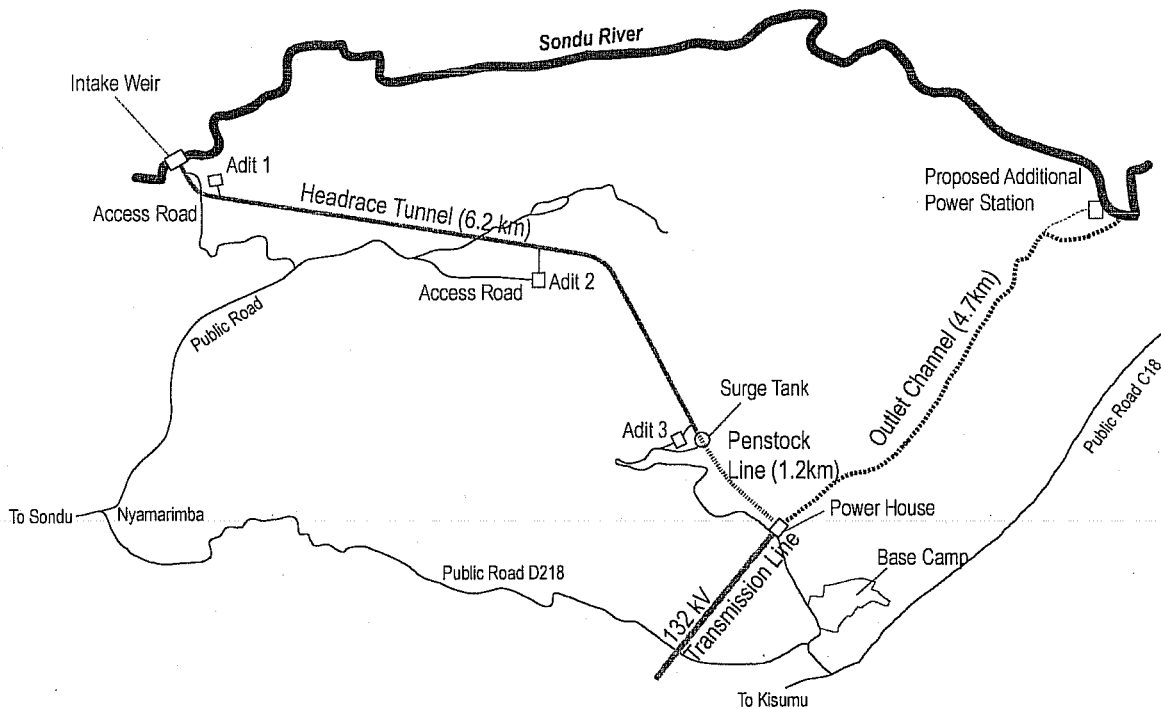
Sondu Miriu Power Project is based on a run-of-river diversion from the weir structure on the Sondu Miriu River above the Nyakach Escarpment (see figure below). The weir structure is about 70 metres across and 18 metres high. The weir structure includes sand flushing facility and the intake will be protected by trashracks. The intake structure leads into a headrace tunnel

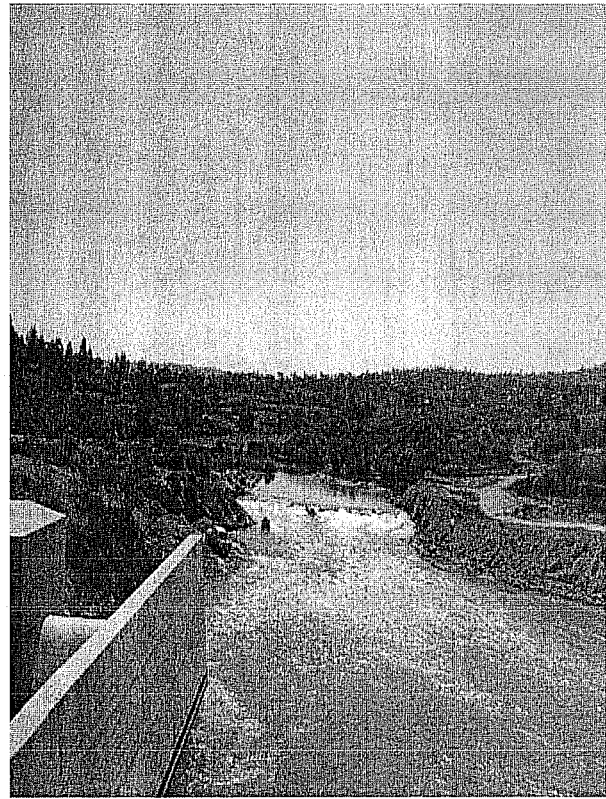
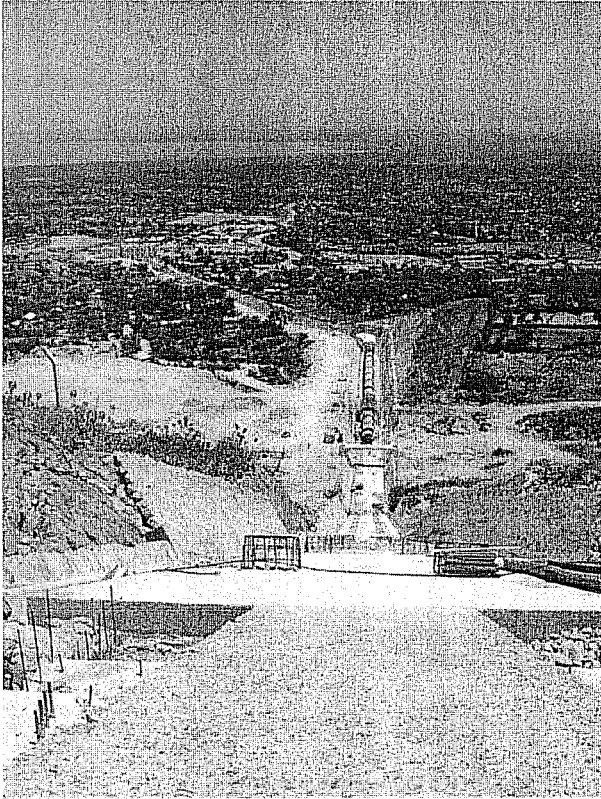
¹ The project's technology is considered load base in the IMNG, thus the project has priority in dispatch and so dispatches all the energy that it produces.

² Although the sponsor is a public entity, it pays income taxes.

approximately 6 km long and down a penstock to the main power station, with two generating units producing around 60 MW, with an estimated annual generation of 330 GWh.

The Sondu/Miriu Project does not have a major dam and associated reservoir but relies on the flow of the river with only a small storage capacity at the Intake. Some water will be diverted to the power station via the intake tunnel while the rest will be left to flow downstream into the original course. There is a tunnel 6.2 km long and 4.2 m in diameter. This will take the water to the top of the Nyakach Escarpment. A steel pipeline (penstock) will connect into the tunnel at the top of the Nyakach Escarpment and take the water down the escarpment, a fall of approximately 200m to the Power Station. The water will then be taken back to the original river, approximately 13 km downstream of the Intake, by a 4.7 km long and 2.6 m bottom wide outlet channel. The electricity will be distributed via a new transmission line to the Kisumu Substation. A 49km transmission line of 135 kV is also being constructed under the project.





The penstock descending to power station

Storage capacity at intake

E. Borrower's Institutional Capacity for Safeguard Policies:

An Environmental Impact Assessment for the project was initially carried out in 1991 by Nippon Koei Company Ltd ("Detailed Design and Preparation of Tender Documents for Sondu Miriu Hydropower project: Environmental Impact Assessment, Data Book (5), July 1991). Focusing mainly on hydrological issues, health issues, and land use. The Kenya Power Company (KPC, now known as KenGen) decided that supplemental socioeconomic studies were required to complete the Environmental Assessment. These studies, which included a baseline survey of the affected community; field studies of households affected by the creation of the reservoir, access road, and discharge channel; an estimation of land values, and the results of stakeholder meetings, were completed in August 1993. These were summarized in an EIA summary completed in September 1993.

The first funds for construction and engineering services were transferred in 1997, and construction work began in March 1999. The first phase was expected to be complete by 2004. Due to institutional and governance concerns raised by the financiers, the Japan Bank for International Cooperation (JBIC), and concerns raised by Africa Water Network and Climate Network Africa (related to habitat loss due to the construction of the tunnel, effects on health of residents, and possible health effects resulting from dust and water pollution during construction) JBIC withdrew funding of the project in 2001. However, social and environmental concerns have been mitigated by thorough resettlement plans, hydrological surveys, and habitat evaluations conducted over the last five years. The Environmental Impact Assessment report was

approved by the National Environment Management Authority (NEMA) in September 2004. As a result, JBIC resumed financing in the 4th quarter of 2004, and the Project construction is ongoing. Construction is planned to be completed by November 2007.

This project was categorized as a B by JBIC in 2006 because it does not correspond to a large-scale hydropower plant, is not expected to have a significant negative environmental impact, does not have characteristics that are likely to exert impact, and is not located in a region susceptible to impact, based on the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002).

Environmental Monitoring Quality Reports have been produced on a quarterly basis, prepared by Nippon Koei Co Ltd. In addition, there is a Technical Committee (first convened in 2000 in response to stakeholder concerns) to address environmental, land compensation and resettlement, employment and economic opportunities, and health, safety and security issues. The committee’s most recent meeting (before the Specialist’s March 2007 visit) was on 26th January 2007. The Technical Committee is comprised of 31 members with voting rights including the affected community members, elected leaders, professionals of relevant disciplines, representatives of locally based Civil Society organizations, Governmental institutions responsible for development coordination in the region, and KenGen. In addition there are representatives from Project contractors and JBIC who attend meetings but do not vote.

F. Environmental and Social Safeguards Specialists on the Team:

Noreen Beg

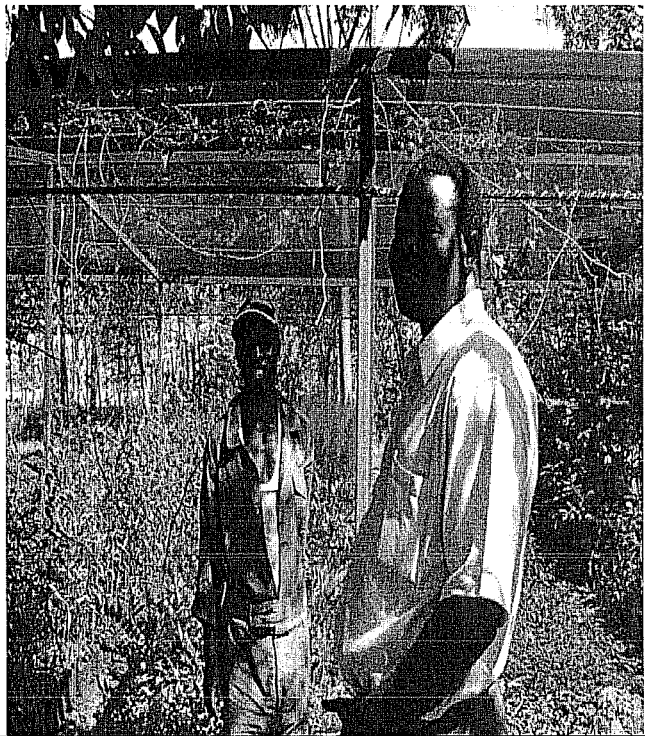
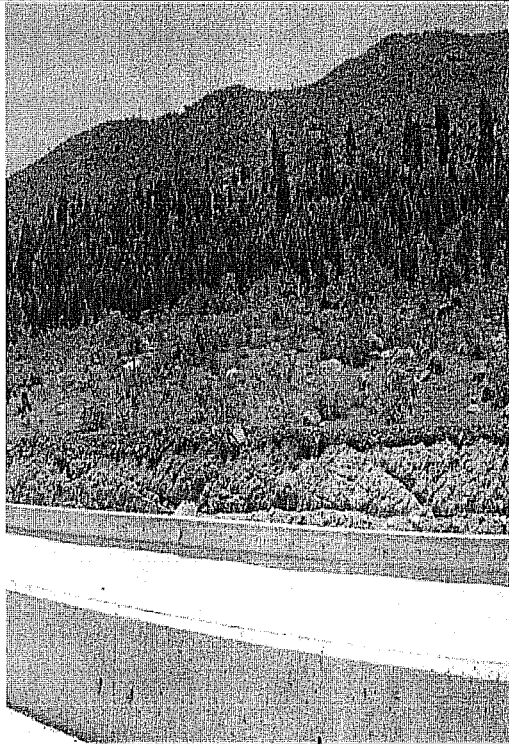
II. SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies Triggered (please explain why)	Yes	No	TBD
Environmental Assessment (OP/BP 4.01)	X		
<p>An EIA was initially performed for this project in 1993. The first Annual Review of Environmental and Social Impacts was undertaken in April 2001 following an integrated monitoring system put in place in September 2000. The First Review drew on baseline data from the pre-project period and data collected since the project became operational in March 1999. Biodiversity studies, environmental flow assessments, stakeholder minutes, social assessments, have also been prepared. Since then quarterly Environmental Monitoring Reports have been prepared. Moreover, the Technical Committee that made a major contribution to the progress of the Sondu-Miriu Hydropower Project will continue to play a leading role, and lead an exchange of opinions and adjustments among stakeholders.</p> <p>All documents discussed in this ISDS were reviewed at a two day site visit, and copies can be made available upon request, with through scanned or hard copies held by the World Bank, or through a request to KenGen. Several interviews were also conducted at the project site.</p> <p>For detailed assessments of specific safeguards issues, please refer to following sections.</p> <p>The project has resulted in a number of positive social benefits, including an estimated 400 new unskilled jobs made available to residents of the project area; and improvement to the road</p>			

Safeguard Policies Triggered (<i>please explain why</i>)	Yes	No	TBD
<p>network leading to 50-100% increase in productivity of plots in the reservoir area as a result of better access to markets. These benefits have had a significant direct impact on the local economy which has grown tremendously in the last five years. (However, some of these jobs will be lost when construction ends, though the increase in electricity connections in the area will provide an additional boost to the economy).</p>			
<p>To combat concerns of dust pollution during construction, water sprinkling on road surfaces and speed limits imposed on construction vehicles are being used as anti-dust measures for areas currently under construction. At the same time, as an anti-water pollution measure, a septic tank has been installed. KenGen will refill gullies to limit dust.</p>			
<p>Water analysis of samples taken from the Sondu Miriu river indicate that the water is of good chemical quality when compared to the WHO standards for potable, irrigation and waste water. Levels of fluorides and nitrates are within recommended levels. Although waters are turbid during the rainy season and contain high levels of iron and manganese, the water does not contain high levels of other chemical substances requiring special treatment. The concentration of oxygen is high. The pH of the Sondu-Miriu river is around 7.2 to 8.67. Water salinity is low, as is the sodium absorption ratio. However, bacteriological analysis indicates high levels of bacteria of faecal origin, from livestock and human waste. As such, the water is not safe for human consumption. (This condition was evident in the baseline study). KenGen has started an information campaign to advise people to boil and/or chemically treat water from the river before drinking it.</p>			
<p>It is unlikely that deoxygenation or eutrophication will occur in the reservoir to any great extent because the flow of water through the reservoir will be sufficient to ensure that such conditions will not develop.</p>			
<p>There is an ongoing study by Nippon Koei to determine the water flow left in the river course after diversion. The absolute minimum recommended river flow is deemed to be 0.5 m³/sec. There is a very detailed environmental flow assessment study undertaken for the project in 2003 by Nippon Koei consultants, in addition to an ongoing assessment of environmental flow conditions (which will, among other things, determine the best means to provide drinking water to communities along the river – piped water, boreholes, etc.) In the project area the river flows at an average of 41 m³/sec, though instantaneous rates can vary from 4 m³/sec during droughts to more than 250 m³/sec in floods. In other words, the flow has to date always been above minimum standards and is expected to remain so. Nevertheless, it is generally accepted that river flow will be reduced when the project starts operation, and that continual monitoring will be undertaken to ensure that any future reduction be compensated between the intake and the point of diversion, and at the point where the outlet joins the river. The study will determine if KenGen should provide piped water from the river at a convenient distance to households or dig boreholes if groundwater is available. Current opinion is that a program to construct 80 boreholes will be undertaken over the next three years.</p>			
<p>Sedimentation is not an issue in the project area.</p>			

Safeguard Policies Triggered (<i>please explain why</i>)	Yes	No	TBD
<p>The project is in an area with high HIV prevalence. In order to reduce HIV infection in the project area, KenGen is financing the Voluntary Counseling and Testing (VCT) center established in the area adjacent to the construction site of the Sondu-Miriu Hydropower Project.</p>			
Natural Habitats (OP/BP 4.04)	X		
<p>There are no wildlife migratory routes along the path of the transmission line.</p> <p>An Environmental Analysis of Ecological and Fisheries Issues prepared by Nippon Koei in February 2003 indicated that the power facility and its operating procedures will have no adverse effect on the majority of the animals and plants of the Sondu- Miriu basin, with the possible exception of hippos. It is believed that daily surges of water down the river bed during peak power production may affect the hippo population of the Lower Zone. It is thought that they would move to the lakeshore or other river deltas where they would be less disturbed. This is not expected to have a negative impact on their welfare, though this should be monitored once the project starts operation.</p> <p>The range of operating scenarios for water flow is not expected to have a significant impact on local community fisheries, or on the abundance and distribution or stock of different fish species. At the request of local communities, some fish transfers were undertaken to improve fish stocks above Odino falls.</p>			
Forests (OP/BP 4.36)	X		
<p>Since a portion of the construction area falls within the boundary of the Koguta Forest Reserve, KenGen obtained a construction permit from Kenya's Environment Bureau on February 8, 2006. The area, however, is characterized by shrubs and sparse woods and is not inhabited by rare species. Therefore, no particular negative impact on the natural environment is expected. Moreover, KenGen has committed to reforest surrounding areas in the Mau Forest, an activity that has already commenced and which was witnessed by the Specialist. In addition, KenGen has created a nursery – the largest in Nyanza province - that provides saplings and seedlings free upon request to the local communities.</p>			

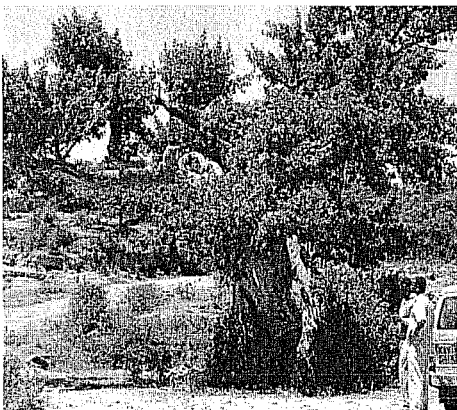
Safeguard Policies Triggered (<i>please explain why</i>)	Yes	No	TBD
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Pest Management (OP 4.09)		X	
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Physical Cultural Resources (OP/BP 4.11)	X		
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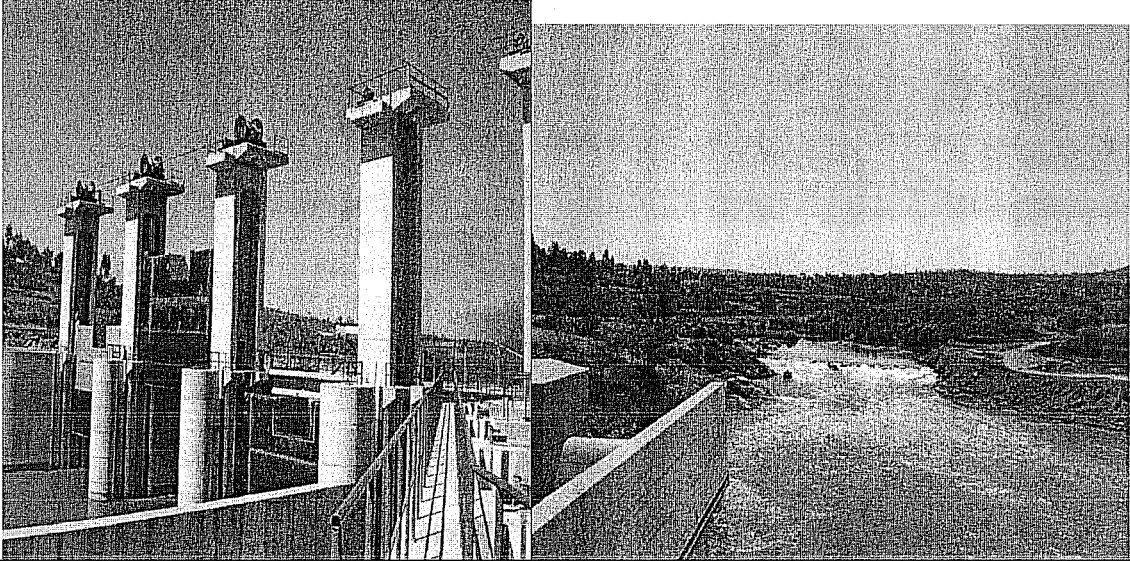
The road from the power plant to the penstock was rerouted at the initiative of KenGen to avoid a tree that is considered sacred by the local Luo community.



Graves at the site of the power plant had to be removed, and were re-located of necessity in a mass grave as many were of quite old provenance and there were no tombstones. Local community members received compensation where they could show evidence of gravesites. The operation was carried out at nightfall in the presence of the community specialist and local

Safeguard Policies Triggered (please explain why)	Yes	No	TBD
religious leaders on-site, to ensure that as much respect possible was shown. No other cultural resources were affected. ³			
Indigenous Peoples (OP/BP 4.10)		X	
Involuntary Resettlement (OP/BP 4.12)	X		
<p>The project team has reviewed resettlement and is satisfied that OP4.12 standards are being met. Sources consulted include stakeholder meeting minutes, numerous files of correspondence, a meeting with the onsite Community Liaison Officer, and interviews with local residents. The stakeholders were given a choice between one-time cash compensation, or other means of compensation (substitute lands, etc). They ultimately elected to obtain cash compensation. There is an ongoing process to ascertain effects of this policy, and a quarterly environmental and social assessment report of extraordinary detail (carried out by Nippon Koei consulting and reviewed by the team) follows up on resettlement, community, and environmental issues, as well as labour concerns.</p> <p>A total of 191 plots (estimated 1,700 people) were directly affected by the regulation pond inundation and discharge channel areas – of which 48 lost more than 50% of their arable area and 36 of the plots were bisected by the discharge channel. In addition, some 62 temporary and 52 permanent houses were affected at the site of the base camp and the contractor's offices. Compensation was provided on a cash basis (at the choice of the community). While there have been complaints that the cash was not well utilized in some cases, after perusing the minutes of the stakeholder meetings, it does not seem that the initial compensation was deemed unfair in the majority of the cases, and there is a Community Liaison Officer permanently on-site to address any new or ongoing claims.</p> <p>Ferry operators at the weir site who lost their livelihood because of the construction of a bridge over the river were given KSh 1,000,000 in compensation, equivalent to as much as ten years earning. Most of them have established small businesses with the income. (Meanwhile the bridge has increased income for local residents as they do not have to pay the ferry operators)</p> <p>The project required land acquisition of an estimated 0.3ha for building tower foundation and 15ha (50 – 55 km to Kisumu substation)for the construction of transmission lines. Compensation has been provided in accordance with the laws of Kenya. A 15 meter wayleave was created on either side of the transmission line, and landowners were compensated for sisal and papyrus crops). A total of 225 households have been relocated to date. Compensation for all relocations is now complete, though some of the compensation for crop loss is still ongoing. Household incomes have shown an upward trend due to wayleave compensation.</p>			
Safety of Dams (OP/BP 4.37)		X	
<p>The height of the weir structure is 18m, but the actual gates are less than half that height. There is no reservoir, though there is a 1 million cubic meter water pond behind the intake for</p>			

³ Africa River Network claims that the construction of the tunnel resulted in the drying up of small local streams sacred to the Luo. The specialist did not find a reference to this in any of the over 200 documents including numerous stakeholder meeting minutes, prepared by an independent consultant. No mention was made of this in discussions with the local community, though the specialist did not ask a specific question related to this.

Safeguard Policies Triggered (<i>please explain why</i>)	Yes	No	TBD
regulation (not storage) purposes. See photos below. There is an Operations and maintenance Plan in place and safety risks are being adequately managed, both by KenGen and the onsite Nippon Koei Consultants.			
			
Projects on International Waterways (OP/BP 7.50)		X	
Projects in Disputed Areas (OP/BP 7.60)		X	

III. SAFEGUARD PREPARATION PLAN

A. Target date for the Quality Enhancement Review (QER), at which time the PAD-stage ISDS would be prepared:

Not Applicable

B. For simple projects that will not require a QER, the target date for preparing the PAD-stage ISDS:

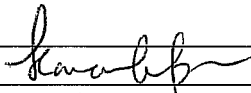
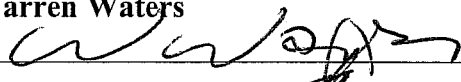
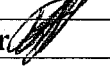
June 15th 2007

C. Time frame for launching and completing the safeguard-related studies that may be needed. The specific studies and their timing⁴ should be specified in the PAD-stage ISDS:

The EIA was disclosed in the country in September 2004 and will be disclosed to the InfoShop on May 30 2007. The SMU has agreed to accept transfer of the safeguard responsibilities.

⁴ Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in-country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.

IV. APPROVALS

Signed and submitted by:		
Task Team Leader:	Karan Capoor	05/25/07
Approved by:		
Regional Safeguards Coordinator:	Warren Waters 	05/29/07
Comments:		
Sector Manager:	Subramaniam V. Iyer 	05/ /07
Comments:		

Philippe Benoit ~~acting~~ for S.V. Iyer