PROJECT IDEA NOTE (PIN)

Description of size and quality expected of a PIN

Basically a PIN will consist of approximately 5-10 pages providing indicative information on:

- **A.** Project participants
- **B.** Project description, type, size, location and schedule
- **C.** Avoided / reduced GHG emissions
- **D.** Financial aspects
- **E.** Expected environmental and socio-economic benefits
- **F.** Risks
- *G.* Other relevant information

Name of the Project	Mpanda Mini-hydro Power Project

A. Project Participants

Project developer (proponent)	
A.1 Name of the project developer	The Tanzania Specialist Organization on Natural Resources and Biodiversity Conservation (TASONABI)
A.2 Organizational category	Non-Government Organization (NGO)
A.3 Other function(s) of the project developer in the project	Facilitation of building and operation of the Mini-hydro Power Plant
A.4 Summary of the relevant experience of the project developer	TASONABI has been at the forefront of most of the natural resources conservation and renewable energy projects in Tanzania. It has over 10 years of experience in advocacy, and in the past 6 years it has built the capacity and expertise in the areas of CDM. It has also built a collaborative base with national and international institutions in the aspects of CDM and climate change in general. Also, the organization has some experience in designing and installing Micro-hydro projects in several places in Tanzania.
A.5 Address	P. O. Box 40192, Dar es Salaam, Tanzania
A.6 Contact person	Mr. Bariki K. Kaale
A.7 Telephone / fax	Tel: +255 754 286273/Fax:+255 22 2667569
A.8 E-mail and web address, if any	bkkaale@yahoo.com
Project sponsors	
(List and provide the following information for all project sponsors)	
A.9 Name of the project sponsor	To be identified
A.10 Organizational category	
A.11 Address (include web address, if any)	
A.12 Main activities	*Not more than 5 lines*
A.13 Summary of the financials	*Summarize the financials (total assets, revenues, profit, etc.) in less than 5 lines.*

B. Project Description, Type, Size, Location and Schedule

Technical Summary of the Project	
B.1 **Project objective**	The objective of the project is to install a Micro-hydro Power Plant that will provide access to renewable energy through mini-grid to several households in Mpanda District in Rukwa region Tanzania. This will reduce dependence on imported diesel used in running generators and eventually reduce emissions of greenhouse gases (GHG).

B.2 **Project description and proposed activities**

Mpanda Mini-hydro power project will be a small scale, low head hydroelectric run-of-river scheme power plant with total installed capacity of 5MW, consisting of 2×2500kW turbines & generators. The project is to be installed on Luegele River in Mpanda District, Rukwa region, Tanzania. According to the preliminary feasibility study, the project will generate approximately 15,000MWh of electricity annually after the installation of all turbines and generators. That means the net annual electricity to be supplied through mini-grid can reach a maximum of 15,000MWh.

The Project activity will achieve credits by avoiding emissions of GHG from the electricity generated from fossil fuel based sources. The total emission reductions credits throughout the crediting period are estimated

to be 111,650tCO_2 – equivalent or 11,165tCO_2 – equivalent annually.

The project will have huge sustainable development impact to the community in Mpanda District such as:

- The project would mitigate the global warming trend by indirectly reducing the GHG emissions from the diesel generators in Mpanda,
- Mpanda District faces the problem of electricity shortage. The project can release the conflict situation of electricity demand and supply, and improve the living standard of the local people,
- Mpanda District is one of the poor districts in Tanzania. The project will improve the infrastructure conditions, provide short-term job opportunities to the local people and thus relieve the poverty of the region and make contribution to the sustainable development of local communities.

Technology to be employed in this project is not common in Tanzania as there are very few Micro-hydro power plants in the country. Project developer will make use of the experience drawn from another micro-hydro plant installed at Kinko village in Lushoto district. Lessons learnt from Kinko project will help TASONABI to design and make the proposed project successful and sustainable.

B.3 **Technology to be employed (including a technical description of the project)**

The proposed Micro-hydro plant is a small scale, low head hydroelectric run-of-river scheme without any water storage. The main buildings will be consisting of a Frontal pressure pool, Penstock, Powerhouse, and Step-up substation, among other things. There will be two water turbines & generators to be installed in the powerhouse, the capacity of each is 2.5MW, and the total installed capacity is 5.0MW. The annual operation hour is expected to be about 3000 hours, and thus the annual power generation will be 15,000 MWh.

Plant installation will involve the construction of high concrete and masonry walls diagonal to the river flow to guide the water to the canal intake. The natural force of water first conducts water to the fore bay and then to the inclined Penstock adjacent to it. The water from Penstock hits the water turbine at the power house floor through a hydraulic head. In the process the mechanical energy will be generated and converted into electricity using the generators. The generated electricity will be supplied through mini-grid to the households in Mpanda District using low voltage transmission lines.

The nearest group of houses is located at about 2km from the proposed powerhouse location. To provide access of electricity to the other parts of the District, about 6 km transmission line has to be built. The cross section area of the wires will vary according to the load, but most likely 320 mm^2 wires will be used for most of the distance. 316mm^2 and 325mm^2 may also be used. The power will be distributed to the different houses in the villages through user connection interface from the transmission line. It is expected that at least 600 houses and several energy enterprises will be connected to the local grid. The duration of the Power Purchase Agreement (PPA) with TANESCO is expected to be between 15 to 20 years.

Type of Project	
B.3 Greenhouse gases targeted	Carbon Dioxide (CO_2)
Type of activities	Renewable energy project
Field of activities	
a. Energy supply	Renewable energy supply
b. Energy demand	N/A
c. Transport	N/A
d. Industrial processes	N/A
e. waste management	N/A
Location of the Project	
B.4 Governorate	United Republic of Tanzania
B.5 City	Rukwa
B.6 Brief description of the location of	The project is located on Luegele River in Mpanda District,

the plant	Rukwa region, Tanzania. Mpanda District is located along an altitude of 1064 meters above sea level, latitude 4° 40' 0S and longitude 31° 37' 0E.
Expected schedule	
B.7 Earliest project start date	2010
B.8 Estimate of time required before becoming operational after approval of the PIN	Time required for financial commitments: 3 months Time required for legal matters: 3 months Time required for negotiations: 3 months Time required for construction: 6 months
B.9 Expected first year of CER delivery	2011
B.10 Project lifetime	20 years
B.11 Current status or phase of the project	Detailed feasibility study is ongoing
B.12 Current status of the acceptance of the Host Country	The final PIN will be submitted to DNA of Tanzania for obtaining Letter of No Objection.
B.13 **The position of the Host Country with regard to the Kyoto Protocol**	Tanzania has signed and ratified the Kyoto Protocol
Project Size	
B.14 **Is the project a small-scale project?**	Yes

C. Avoided/ Reduced GHG Emissions

C.1 **Selected Crediting Period**	
10-year non-renewable crediting period	
C.2 **Estimated Avoidance/Reduction of emissions in accordance with the Kyoto Protocol**	
▫ Carbon Dioxide(CO_2)	11,165 tCO_2 - equivalent per year 111,650 tCO_2 - equivalent for 10 years
▫ Methane (CH_4)	N/A
▫ Nitrous Oxide (N_2O)	N/A
▫ Hydrofluorocarbons (HFCs)	N/A
▫ Perfluorocarbons (PFCs)	N/A
▫ Sulphur Hexafluoride SF_6	N/A
Reference Scenario or Baseline	

C.3 **Baseline Methodology to be used**

The proposed project will use the baseline methodology, AMS 1.A **"***Renewable energy projects (Electricity generation by the user)"*. This category comprises renewable energy generation units that supply individual households or users or groups of households or users with electricity. The applicability is limited to households and users that do not have a grid connection except when a group of households or users are supplied with electricity through an isolated mini-grid where the capacity of the generating units shall not exceed 15MW. These units include technologies such as solar power, hydropower, wind power, and other technologies that produce electricity all of which is used on-site by the user, such as solar home systems, and wind battery chargers. The renewable generating units may be new or replace existing fossil fuel fired generation. The capacity of these renewable energy generators shall not exceed 15MW.

C.4 **What modifications the project would induce?**

The project will generate power from a renewable resource, which does not emit GHGs to the atmosphere, thus helps in tackling the problem of global warming.

C.5 **What would be the situation in the absence of the project activity?**

In the absence of project activity, electricity in Mpanda District would continue to be generated from fossil fuel resources (diesel generators), which emit carbon dioxide to the atmosphere contributing to the problem of global warming. Also in the absence of project activity, population currently not accessing power in Mpanda District will be supplied with power to be generated from fossil fuel resources.

Expected Emission Reductions During the Crediting Period

C.6 **Total Certified Emission Reductions per year**: 11,165 tCO_2 - equivalent

C.7 **Total Certified Emission Reductions for the Crediting period**: 111,650 tCO_2 - equivalent

D. Financial Aspects

Total Estimated Costs(*)	
D.1 Development Costs	US$ 0.5 M
D.2 Installation Costs	US$ 0.8 M
D.3 Other Costs	US$ 0.2 M
D.4 Total Cost of Project	US$ 1.5 M
(*) Please add any additional relevant information in this table if needed.	
Sources of Identified Financing	
D.5 Cash	
D.6 Long Term Loan	
D.7 Short Term Loan	

Expected Revenues from CERs transfer	
D.8 Projected Price of the CERs	US$ 15/tCO_2 - equivalent
D.9 Estimated total CDM Revenues	US$ 0.17 M per year
D.10 Details of the expected Revenues during the accountability period	US $ 1.7 M for 10 years
D.11 Amount and Modalities for the transfer of the CDM Contribution Advanced allocation…… Yearly transfers……	 …….In $ US …….In $ US
Additional Financing	
D.12 Will the project receive co-financing under ODA (Overseas Development Aids) or from any other sources like GEF? Please mention the amount(s)	No

E. Expected Environmental and socio-economic Benefits

Specific global & local environmental benefits	*(In total about ¼ page)*
E.1 Which guidelines will be applied?	Tanzania environmental and social guidelines for sustainable development as identified in the CDM national investor's Guide of 2004
E.2 Local benefits	- Enhanced energy accessibility by communities living in Mpanda District through power produced from the renewable energy resource. - Reduced local air pollution from the diesel powered generators currently employed in Mpanda District.
E.3 Global benefits	Reduced emissions of GHG emission (CO_2) by replacing the diesel powered generators with Mini-hydro power plant.
Socio-economic aspects E.4 What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? Explain the relationship between the project and the benefiting community/ies.	- The project will allow the rural community to exploit its significant economic potential. To increasing liveliness to the community through improved commercial activities, health condition, and education, thus bringing about rural transformation and poverty alleviation - The project will improve the socio-economic conditions through creation of directly and indirectly employments. The community and TASONABI have agreed on components which will facilitate the consumption of supplied power for productive and social purposes. - Improving education services due to improved and longer illumination period, which will encourage reading habits of village students.
E.5 Which guidelines will be applied?	Tanzania environmental and social guidelines for sustainable development as identified in the CDM national investor's Guide of 2004
E.6 What are the possible direct effects (e.g.,	- Limited employment opportunity will be created during

employment creation, capital required, foreign exchange effects)?	the construction and maintenance of the plant - Income from the selling of carbon credit could increase the plant's revenue. - This project could be replicated in other areas potential for micro-hydro power production in the country.
E.7 What are the possible other effects? For example: - training/education associated with the introduction of new processes, technologies and products and/or - the effects of a project on other industries	The project will increase the market quality of local industries as well as the quality of local expertise in the construction and maintenance of hydropower equipments.
E.8 **Environmental strategy/ priorities of the Host Country**	Tanzanian prioritizes environmental protection and promotes renewable energy technologies for achievement of sustainable development.

F. Risks

Risks in the Project	**Please describe the factors that may cause delays in, or prevent implementation of the project**
Estimate the Degree of Risk	
F.1 Technical risk	Medium technical risk as the technology to be employed is already in use and local expertise is available.
F.2 Timing risk	High timing risk as legal and regulatory CDM processes are yet to be completed.
F.3 Budget risk	High budget risk as the project funding is not yet secured.

G. Other Relevant Information

Please mention any additional information or precisions to justify the project under CDM