PROPOSAL
COMMUNITY MANAGED MICRO HYDRO POWER PLANT
WOLOFEO COMMUNITY, MAUMERE, FLORES, INDONESIA

A. Information of Applicant:

1) Name of Applicant: Lena house Flores
2) Contact person: Stanislaus Didakus Y.M.
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   Wodong – Maumere – Flores, NTT, Indonesia
   Mobile phone: 081339407733
   email: didakus2003@yahoo.com, Ddidakus@gmail.com
4) Local and international partners of Lena house: Caritas Maumere (CKM).

B. Project Information

1) Title of the project: Community Managed Micro Hydro Power Plant
2) Summary of the project:
   Community managed micro hydro power plant is aimed to create a better life for poor people in the rural area named Wolofeo through developing a sustainable energy especially electricity supply. The project will be implemented in six months since the signing of agreement which is planned from December 2011 to May 2012. There is 39 families with 144 people will involve actively in doing this project. Besides as implementer, those people are also beneficiaries. In addition to that, other four public buildings (school, church, orphanage and nursing home) within this community will also use the output of this project. In the near
future there are also 22 families which are potential beneficiaries because they have the same resources. The amount of money requested for funding this project is: IDR 61,645,500 or Euro 5224.

C. Project Background

Wolofeo parish is one difficult area in term of access and infrastructure among the 35 parishes in Maumere diocese. It is located on the mountainous rural area around 57 km from Maumere to the north western part. Communication network is very bad to connect this place with other place in the diocese mainly caused by bad road access and no telephone signal.

The difficult condition might be worse because of no electricity from government electric company. Office, church, school and health service centre don’t have enough power to support their daily work with using electric instrument. They rely on fuel generator which couldn’t support whole day usage. It is rather similar with other common people. Some ‘rich’ people may have small generator used for their own families, but poor people use small lamp using kerosene fuel in their simple houses. At night most people could not do anything, even school children who also could not learn something for their class for the next day.

Although the place is bad with access and electricity, this area is rich with water. One big river flows down along some villages which are located on its riverside. Based on its water volume, those villages may produce electric power from this river. The opportunity was caught by one village in the riverside of Wolofeo parish, named Wolofeo village. For two years, they have developed by trial and error their own micro hydro electric plant with 5 KVA to support their village in lighting, led lamp charging, hand phone charging and even two houses among that twenty seven household have used the power for television. It is a small dot light in the darkness.

Although Wolofeo has been starting to use this hydro power plant for two years, the limited resource of community made it not good enough for supplying the power for all 36 families which consists of 144 people. Besides, in rainy season the
electricity also often black out because the damage of its intake and canal. There are two main reason causes this situation. Firstly, its infrastructure (intake, pipe line and turbine) was not well designed and built. Secondly, the community has no bigger AC dynamo than the 5 kW dynamo they are using currently. They need to enhance the capacity of AC dynamo as the water volume can still support to run up to 20 kW Dynamo. Another problem, no MCB (Mini Circuit Breaker) on every house also makes the power stability is very low.

**D. Project description**

1) **Beneficiaries**:
   
   Wolofeo community will be the main beneficiaries for this project. There are 39 families consists of 144 people who live as farmers in the area of turbine house. And four public facilities (church, health village center, orphanage, school building) which need cheaper and durable energy. There are still 22 families more in next village, Watuteke, which might be potential beneficiaries to get the extension electric power wire.

2) **Overall objectives**:
   
   “The creation of a better life of poor people through developing sustainable energy on micro hydro power plant.”

3) **Project purpose**:
   
   “Every house and public facilities in Wolofeo community has enough power for electricity to be used for lightening, comfort, and any potential livelihood by 2014”

4) **Services to be delivered by the project**

   1. The creation of an effective and durable water canal for keeping a fluent flow and head of water from intake to the pipeline.
   2. The creation of a safe house to keep all the needed electric equipment may run well and durable.
   3. There is a new 20 kW dynamo to fulfill the power needed by 36 families in Wolofeo village
4. There is 36 MCB to manage the usage of electric power of each household to keep the stability and control of produced power.

5. There is 300 meter electric wire to optimize the power fluency from turbine house to the village.

5) Project activities:
1. Renovate 200 meters water canal and 2 x 2 intake
2. Renovate turbine house
3. Supplying a new 20 kW dynamo
4. Supplying 36 mini circuit breaker (MCB)
5. Supplying of three rolls of good quality electric wire
6. Building and installing all wire net and MCB from turbine house to the village and public building.

E. External factors
1) Assumptions:
- There is cooperation between Wolofeo community, and qualified technician in building all parts of micro hydro electric plant.
- There is support financially from donor institution.

2) Possible negative side effects:
Without any good explanations about the usage of electricity, un-experienced poor people may get electric shock in their daily life. This area also faces strong wind almost every year so a weak and bad wire net may cause problem for people in the village.

F. Implementation
1) Technician is leading the work
The project will involve knowledge and skill of good and experienced technician. It is lucky that this community has their own technician, a man who is very experienced in design and building such project. Although he comes from this village but now he is working in one place in Sulawesi to implement
such project as the way he earns money for his family. When material and men power are ready the community member will invite him to work on this project. This is based on agreement with him after he finished current hydro power plant some times ago. He would lead all the work on this project, and get money for his job half in the beginning and half at the end of the project.

Large group of community member will help and support to build canal, turbine house and intake. There are three people who are skilled in concrete building and the other will prepare the mixture of cement, stones, wood and zinc. Those community members will also help an electric technician to build a good wire net of electricity and post as necessary from the turbine house to the village. They will work on installation of MCB and wire in every house to be ready for used.

2) Project organisation and implementation procedures:
Didakus and community leader will coordinate, monitoring, controlling and report all aspect of this project. In community level, there is one team who takes responsibility for running this project and keeps doing maintenance of the power plant. This team has been working for last two years and has adequate experience and skill to manage this hydro machine. They are led by

- Agustinus Da (team leader),
- Fransiskus Laba, (vice team leader)
- Yakobus Keta (finance)

and one team of maintenance:
Dion, Ambrosius and Fransiskus.

This team will also make agreement and contract with those technician mentioned above. And they will coordinate all process, material supplies, consumption, schedule of working, etc, under the assistance of Didakus.
All process of project implementation will be documented well to be a learning subject for other village if they want to replicate the project.

3) **Timetable:** March 2013 - December 2013

<table>
<thead>
<tr>
<th>NO</th>
<th>ACTIVITIES</th>
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<tr>
<td></td>
<td></td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>1</td>
<td>Preparing material, group division, technician, etc</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Renovate 200 meters water canal</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Renovate turbine house</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Installation of 20 kW dynamo</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Installation of electric component and MCB in 36 houses and 4 public building</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Build the network</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Monitoring</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Evaluation and Reporting</td>
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</tr>
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</table>

4) **Budget:**

<table>
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<tr>
<th>NO</th>
<th>ACTIVITIES</th>
<th>UNIT</th>
<th>UNIT PRICE</th>
<th>FREQ</th>
<th>TOTAL</th>
<th>EURO</th>
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<tbody>
<tr>
<td>1</td>
<td>Renovate 200 meters water canal</td>
<td>Cement (sack of 50 kg)</td>
<td>Sack</td>
<td>68.000</td>
<td>190</td>
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<td>Sands</td>
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<td>Renovate turbine house</td>
<td>Cement (sack of 50 kg)</td>
<td>sack</td>
<td>68.000</td>
<td>130</td>
<td>8,840.000</td>
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<tr>
<td></td>
<td>Sands</td>
<td>Sands</td>
<td>truck</td>
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<tr>
<td></td>
<td>Steel</td>
<td>Steel</td>
<td>bar</td>
<td>65.000</td>
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<td>650.000</td>
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<td>Buying 40 mini circuit breaker (MCB)</td>
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<td>145.000</td>
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<td>5,800.000</td>
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<td>4</td>
<td>Ten rolls of electric wire</td>
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<td>6</td>
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<td></td>
<td>installation</td>
<td>truck</td>
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<td>3.200.000</td>
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<tr>
<td>7</td>
<td>Transportation for material from town to the village</td>
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<td>Transportation, reporting and documentation by Didakus</td>
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<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>61.645.500</strong></td>
<td><strong>5224</strong></td>
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</tbody>
</table>

5. Method of financial support is transferring by pay pal, or bank account after a contact with Didakus.

G. Long term viability and future

1. After project implementation, the community will manage the micro hydro electric plant rely on their own resources. It is expected that community member may give larger contribution around Rp.15.000 to Rp.20.000 per month for the maintenance after the improving of power source. It will be in balance with the satisfaction of everybody that gets enough power for their needs in the family. Small amount of that money also gives to the maintenance personnel for controlling and monitoring the turbine working.

2. Social viability:
   
   The project will give community a very good impact on social and economic life. The solidarity and coherence of community group member will be increased while and after the project. Besides, there will be empowerment for their organization to manage the operation of that power plant. In the other hand, they will also get the transfer of knowledge of such simple technology and prepare an opportunity to develop a more complicated technology. Socially, this community will be more open also if the project works, other people from different community will come and learn from them about the project. Economically, this power supply can be used for carpentry, making pot clay (need training) and also some electric tools in the church, school, orphanage and nursing home.
3) Beneficiaries participated in the project design.

The project was started by community members themselves and operated by them since 2009 although it is still in a very simple technology. The community has tried to arrange canal, intake, turbine house and also wire net although it is still in minimum standard and even using natural canal. This project will just improve all the components to create more efficient system of micro hydro power plant in order to produce enough power for every household and public building; and even for carpentry or clay pot. In all process and stages, community members already involved fully and actively and will still take responsibility for maintaining the system.

4) Environment:

Micro hydro electric plant is one example of the developing of green energy to fulfilling the needs of community. It would bring closer the relationship between human being and the nature. Men should be realized that without preserving the water resource, this efficient technology will not last long. That is why they should keep planting and planting many trees along the river, water spring and in the forest.

It is planned that every three months the community will have voluntary work related to reservation and reforestation. They will manage to supply seed of much kind of trees and plant them in many places around headwaters area. Besides, they will also restrict deforestation and open new field by slash and burn farming system.

H. Monitoring and evaluation

Monitoring will be done by Didakus under consultation of those technicians. Organizing team will manage submitting real achievement of every stage and what is the result of their work. Those donors who visit Flores and Lena house are welcomed to visit the location. We are opened to get suggestion and critics from any expertise visitors for improving the project.
Evaluation will be done with the community members informally at the end of every stage of work to get some feedback and improve the work system. More formal evaluation which involves more people such as local government, priest, community, etc will be done at the end of project. It will become a moment of exit of Didakus’ role from the community and give full responsibility to community member.

L. Closing

At the end of this proposal, Lena house and Wolofeo community appreciate and express lots of thanks to all of you which pay a lot of attention before and after the project to build sustainable and efficient energy for poor people in our community by supporting our effort to create a better life in the difficult area. May God bless you and your work.

Maumere, February 15, 2013
Sincerely yours,

[Signature]

Stanislaus Didakus Y.M.
Lena house management
Some photos of current power plant with self support from community:

Picture 01: Maintenance team members are repairing the canal after a flood on the river every rainy season
Picture 02: Water flows through the natural canal

Picture 03: Water flows into the intake tub before flowing into the pipeline

Picture 04: Pipeline connecting the intake tub to turbine house (propeller is inside)
Picture 05: Turbine house made from bamboo and second hand zinc

Picture 06: AC Dynamo with 5 kW electric power
Picture 07: Dynamo and propeller below it

Picture 08: Turbine house from backward