

# Project Proposal

Bilgaon Micro Hydro Power Project  
Narmada Valley

**Prepared by People's School of Energy,  
Kannur, Kerala.**

**For**

People's Committee, Bilgaon  
&  
Bombay Sarvodaya Friendship Center

## PREFACE

The concept of Sustainable Development relies heavily on judicious use of natural resources. This in other words means maintaining the fragile balance between the resource use and exploitation. But to strike the balance is rather a difficult task, threshold into consideration, for excessive demands are made on limited resources. The causes and effects of environmental problem arising from an imbalanced approach and inappropriate technology such as large macro hydro project, are complex, interlocked and unmeasured. The impacts - frequently synergistic in nature - could sometimes be irreversible. However, the only solution to these problems is to minimise the impacts : smaller the project, lesser the impact. This is where Micro Hydel Projects play an important role. They rarely cause any environmental damage.

Although development of a Micro Hydro Project in Bilgaon was inspired by the Narmada movement, the benefits of such a venture goes a long way not only in liberating the people of Bilgaon area from 'darkness', but also in minimising the negative impact upon the local environment. The development of a technologically, economically and financially viable Micro Hydro System in Bilgaon - was made possible by adapting Micro Hydro Technology from other Asian countries (such as Nepal), which was improvised by People School of Energy to suit the local conditions.

## Project Overview

Name of the project : Bilgaon microhydro power project  
Name of the stream : Udai river

## Location

Water intake : Above Bardhariya water fall in Satpura Ranges  
Village : Bilgaon  
Tahsil : Dhadgaon  
State : Maharashtra

## Watershed particulars

Beneficiaries : At least 191 unelectrified adivasi households in Bilgaon plus one residential school holding 300 Students and can be extended to Maal village with 160 households.

### Technical features

#### Civil

Gross head : 8 m  
Design flow : 390 lps  
Electrical power output : 15 kW  
Type of system : Run-off the river  
Diversion system : Concrete channel  
Length = 66 m bed width = 1 m  
Height = 0.65m bed slop = 1 in 714

Forebay : concrete tank holding 20,000 litres

Penstock : material -  
Diameter - thickness - } Suitable measures  
Length = } to be worked out

Power house : surface, 6m x 5m x 3m.

Turbine : 19 kW mechanical output crossflow Turbine

#### Electrical

Generator : 19 kVA, 3 phase, 50 Hz, synchronous Generator.  
Control panel : distribution busbar, switch gears, meters & indicators.  
Safety measurements : three phase electronic load governor, over voltage & short circuit protection system.

Distribution network : through local grids using weather proof cables and locally available wooden poles.

Cost of installation : Rs 5,25,000

Cost of installation /kW : 35,000

Unit energy cost :

Cost of distribution : Rs 2,00,000

Total project cost : Rs 7,25,000  
 Additional likely cost for  
 Extending the benefits to village Maal: 2,00,000

## Site Survey

The availability of head, identification of suitable locations for water intake, forebay tank and power house and measurement of flow in the stream were carried out in the site survey in September 2000, an anticipation of flow was also made in consultation with local people and assessed the flow in the stream by area - velocity method.

Power	15 kW	10 kW	5 kW
Flow requirement	390 lps	254 lps	130 lps

### Stream flow particulars & power generation profile

Months	Anticipated Minimum flow	Remarks	Water availability for Power generation	Possible generation in a day
January	NM			
February	NM			
March to June	NM			
July to October	*600 lps	Ample water available		15 kW
November	NM			
December	NM			

- Flow measured in 5<sup>th</sup> September - 745 lps
- NM - Not measured

### Demand Assessment

The electricity demand of the area was assessed by conducting a meeting in the village itself. A simultaneous maximum demand of 12 kW is anticipated. Considering the future demands, maximum power generations fixed to be 15 kW.

### Execution of the project

The execution of the project should be through the direct responsibilities of the beneficiaries.

### Operation and Maintenance

The O&M is the responsibility of the beneficiaries.

## Benefits of Bilgaon 15 kW Micro Hydel Project

### 1. Lighting

It can provide electric light to 161 houses in Bilgaon and 151 houses in Maal village. The school and other public utilities in the village can also be provided with electricity.

### 2. Drinking Water

Fetching drinking water from the rivers is a laborious job of the village women. The project can provide drinking water to the hamlets in the vicinity of the project site. This will relieve the work load of the village women a lot.

### 3. Grinding Unit

Much physical labour of the women is being put into use to grind the foodgrains by traditional methods. The diesel units are only accessible to the wealth due to exorbitant rates. So one or two community controlled grinding units can be started in the village which will in turn reduce the work load of the women-fold in addition to financial benefits.

### 4. Irrigation

Irrigation can be made to atleast 20 hectares of land on the vicinity of the project site. The people of other places can also use electric pumps to irrigate their lands in a restricted manner to ensure that adverse effects will not be created to the ecology and sociology of the society.

### 5. Oil Extracting Unit

One or two oil extracting units can be started with the electricity generated from the project. Oil extraction is a very difficult task in the village now.

### 6. Community Recreation Centres

One or two community recreation centres having facilities like radio, TV, etc. can be started with the electricity.

### 7. Employment Opportunities

Direct employment opportunities as detailed below will be generated by the project.

- |  |         |
|--|---------|
| a. Operators to operate the systems                  | - 2 nos |
| b. Maintaining staff to maintain the lines and wires | - 2 nos |
| c. Office staff to collect charges and keep accounts | - 2 nos |
| d. Grinding Units                                    | - 2 nos |
| e. Oil extraction units                              | - 2 nos |

Total	- 10 nos
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SIMILAR BENEFITS CAN ALSO BE EXTENDED TO MAAL VILLAGE, 2 ½ KMS FROM BILGAON, DETAILS OF WHICH CAN BE WORKED OUT.

## **Administrative Plan of the Project**

The decision making body of the project (General council) will include 161 households in Bilgaon or if Maal village too is included then all the 312 beneficiary families (161 in Bilgaon<sup>1</sup> and 151 in Maal) one representative of Ashramschoo in Bilgaon, and two or three representatives of the project implementation agency (PIA).

Three different committees to handle Technical, Financial and Administrative aspects of the project is needed. The formation and representation to these committees can be made as follows:

Total houses (312) in the two – Bilgaon and Maal – village can be divided into clusters of 10 houses each. One member from every cluster is selected to each of the committees making the total strength of each committee 11. In addition to the 31 elected members one member from PIA should be there in each committee making the strength 32.

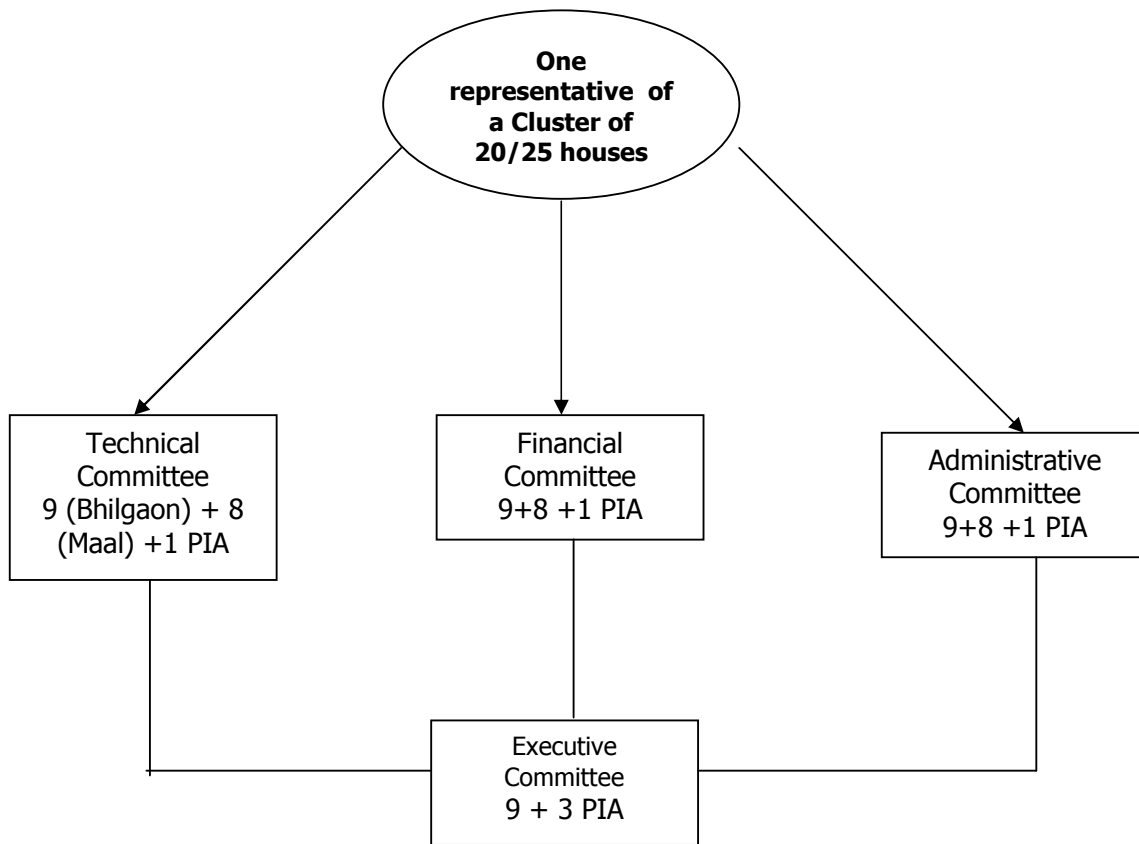
Nine elected members and the representative of the PIA from each committee will form the executive body of the project. The number of members will be so. From the executive body office bearers of the project can be selected, if needed.

To settle the issues which may cause a division in the society, an elders council can be formed. The elders council will comprise of village elders, members of the local bodies and the representative of the PIA, nominated for the purpose. The number of members in the elders council can be fixed as 15. The decision of the elders council will be final in all disputes.

A graphical representation of the administrative structure is as follows:

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<sup>1</sup> Ashram school is run by Adivasi Satpuda Shikshan Prasarak, Mandal, Dhadgaon. They have submitted and informed about our plan, and requested to participate and contribute both.



### Rough cost estimated

Weir & intake	- 75,000
Channel & forebay	- 35,000
Anchor blocks	- 10,000
Power house	- 15,000
Penstock	- 2,00,000
Turbine	- 55,000
Generator	- 50,000
Control	- 45,000
Design & supervision	- 15,000
Distribution (approx.)	- 2,00,000
Overheads	- 25,000
<b>Total</b>	<b>- 7,25,000</b>
Extension to Maal	- 2,00,000
<b>Grand Total</b>	<b>- 9,25,000</b>

Share by the beneficiaries:

- Labour – manual and skilled – total by the villagers and volunteers. (valued @ minim. Wage: Rs 60,000). Labour costs not therefore included in the proposal as its shramdaan.
- Part contribution to capital cost – by the Ashram school
- Periodic contribution for tear and wear, receiving cost per family – to be decided.
- Management of the project and regular maintenance – voluntary work by the people's committees.