

# Case Study: Survey Optimization of Solar-Hydro Hybrid Energy Resources in Remote Villages of Korba-India using HOMER Pro

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**Abstract**— This paper presents the survey optimization of hybrid energy. The computations are completed by HOMER Pro. This paper proposes the area survey report and power crises report. The input solar radiation data is obtained from the (NASA) National aeronautics and space administration.

**Key words:** Solar, Hydro, Economical Analysis, HOMER Pro

The Number of Houses present	95
Average no. of members in Family	5
Total Population	475
Load present	5Kw

Table 2: Data of Pahand Gawn Village

## I. INTRODUCTION

Chhattisgarh is the middle heart of the India which belongs to one of the Asian countries. Chhattisgarh is the state of power but in some places of the Chhattisgarh, we are facing some troubles in the field of electricity such as in some mountain/hilly areas and some forest area or in some remote villages. We have presented here the survey report of one of the type of village area which is facing problem of power crisis. Senha and Pahand Gawn (in pali) are such type of two places which are located in korba district at Chhattisgarh in geographical map of the world between 22°,35' N latitude and 82°,75' E longitude. Demand of electricity is increasing day by day with the importance of living standard, development of industries, development of agriculture production as well as progress of country. Due to the failure in the generation of power capacity as per the demand. That is why, to reduce uprising demands other options are preferred.

### A. Survey

An effective survey should be planed carefully and maintain all the legal liability. As survey is come to find the crisis of power, present energy, life style and the sources available there etc. The survey report of all the data is collected from the village senha and pahand gawn where the people have very simple way of living. The houses present in these villages are 50 to 95. The report is briefly discussed according to the study.

### B. Overcome of Survey

#### 1) Profile location -1

Name	Senha(korba) Chhattisgarh, India
Latitude & Longitude	22°, 35' N , 82°, 75' E
The Number of Houses present	50
Average no. of members in Family	5
Total Population	250
Load present	0 Kw

Table 1: Data of Senha Village

#### 2) Profile location -2

Name	Pahand gawn (pali) Korba, Chhattisgarh, India
Latitude & Longitude	22°, 35'N , 82°, 75'E

## II. SOURCE OF ENERGY PRESENT IN THE TWO LOCATIONS

### A. Solar resources

The data of monthly solar radiation are present in the table shown below.

Month	Radiation Data
Jan	5.66
Feb	6.38
March	6.24
April	5.83
May	5.24
June	4.44
July	3.32
Aug	3.30
Sept	4.05
Oct	5.60
Nov	6.13
Dec	5.82

Table 3: Monthly Radiation Data

The graphical representation of available solar resources according to the survey data from the proposed zone is shown in figure 1.

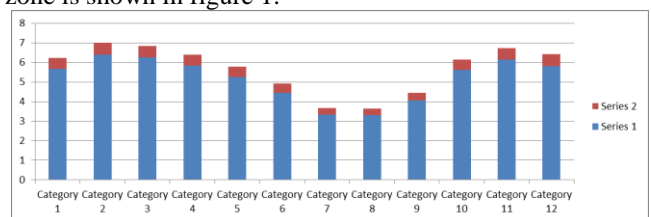


Fig. 1. Available Solar Resources of Proposed Zone

### B. Hydro Resources

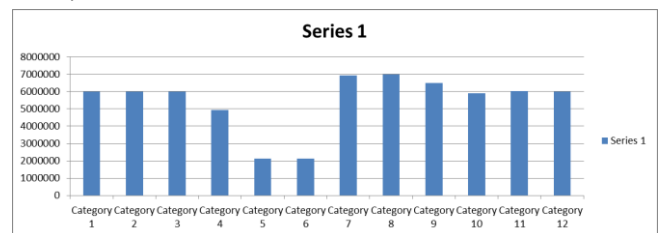


Fig. 2. Available Hydro Energy based on Flow Rate of Proposed Zone

The graphical representation of hydro energy are shown according to the flow rate of the data.

### C. Load Estimate

- As per senha: no load / 0 kW.
- Needed average load: 13.20 kW.
- As per pahandgawn: 5 kW
- Needed average load: 27.647 kW

### D. Source Selection

The sources are selected according to their potential of source report all the available source are Solar PV and Micro Hydro.

### E. Input Load

The graphical representation of input load data with the help of HOMER is shown below:

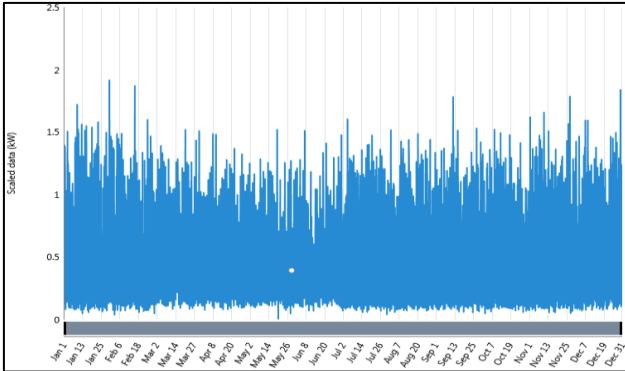


Fig. 3: Input Graphical Data of Pahand Gawn

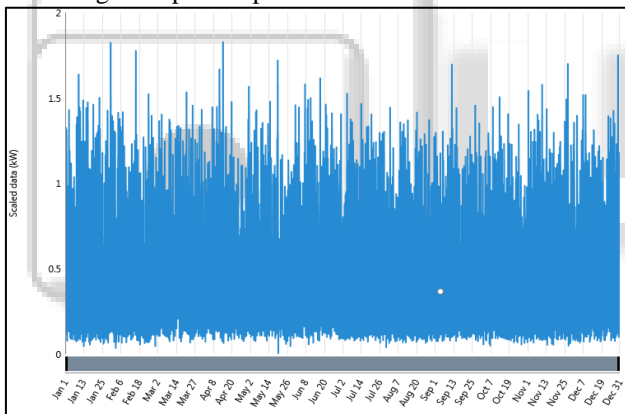


Fig. 4: Input Graphical Data of Senha

## III. SURVEY OPTIMIZATION REPORT/ CONCLUSION

The experimental data and research analysis gave as brief information about the solar energy and micro hydro energy distribution in korba district and it help to develop hybrid renewable energy system consisting of hydro and solar that is constantly replenished. Lots of village in India are undeveloped and they have not transportation, no sufficient communication, no reliable energy source therefore such type of hybrid system are useful for fulfilling their energy requirement.

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