SMALL HYDRO POWER FOR RURAL ELECTRIFICATION IN ASSAM

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INTRODUCTION

Rural electrification is the key for accelerating rural development as electricity is essential to cater to requirements of home lighting, agriculture, rural industries, khadi and village industries, healthcare, education, information technology etc.

Assam has about 87% of the State's population living in rural areas. Out of a total number of more than 26000 villages in the State 70% have been electrified. However, with electrification of only 16.54% of the households of electrified villages, Assam is only next to Bihar (5.13%) and Jharkhand (9.99%) and considerably below the national average figure of 43.5%.

So, a large number of households in the State do not have electricity and use kerosene for lighting. Even for those areas, which are electrified, there is a tremendous shortage of power supply. Thus it is not uncommon for these areas to have 10 – 15 hours of blackouts and brownouts every day.

As per 2001 census 87.09% of the total population of Assam live in 26,247 villages. As on March 31, 2006, 21,586 villages have been electrified through conventional grid by Assam State Electricity Board (ASEB). Thus the percentage of total villages electrified so far is about 82%. However, only 16.54% of the total households in these electrified villages have electricity connection. Thus while 83.46% of households in the already electrified 21,586 villages is still deprived of electricity, 4661 villages are still to see the light of electricity. Again, a total number of 2145 un-electrified villages have been identified as remote where supply of electricity through conventional grid is either not possible or not feasible. So, the State has great task ahead as Govt. of Assam is committed to provide electricity to 100% households in 100% villages by year 2012 by ensuring accessibility and availability of electricity to the households through technologically & institutionally arranged (a) schemes integrated to allow for grid extension for adjacent settlements, and (b) stand alone distributed generation systems, local distribution systems or decentralized generation.

The Assam State Electricity Board has identified 2145 un-electrified villages, which have been identified as remote where supply of electricity through conventional grid is either not possible or not feasible. Since these villages are non-feasible for grid power supply, for electrification of these villages, non-conventional and renewable energy is the appropriate solution.

There is immense potential for development in non-conventional and renewable energy sector in Assam specifically in respect of electrification of remote un-electrified villages by decentralized solar photovoltaic systems, small and microhydel projects, biomass gasification, water heating through solar thermal, etc. The Assam Energy Development Agency (AEDA),

the State Nodal Agency of the Ministry of Non-conventional Energy Sources (MNES), Govt. of India formed out of the erstwhile Energy Division of the Assam Science Technology & Environment Council (ASTEC), has identified the potentiality of three renewable sources of energy specifically for electrification of remote villages, viz., small hydro, biomass gasification and solar photovoltaic.

SMALL HYDRO POTENTIAL IN ASSAM

The hilly areas of the State have good hydro potential as small streams can be harnessed for decentralized power generation through small hydro development. These hilly areas mainly fall within the two hill districts - Karbi Anglong and North Cachar Hills. The exact estimation of total potential of small hydropower development in the State is yet to be made. In Assam mainly two agencies, the Assam State Electricity Board (ASEB) and the Assam Energy Development Agency (AEDA), are involved in survey, preliminary investigation, preparation of Detailed Project Reports, and execution of small hydro projects. The ASEB has so far identified 93 small hydro sites with a total potential of 159.37 MW, 1 of which has already been commissioned but has been inoperative since 1993 while 4 others are under various stages of execution details of which are given in Table 1 and Table 2.

The AEDA has so far identified 6 small hydro sites having a total potential of 2.21 MW, 2 of which have already been commissioned while DPRs have been prepared for 3 sites. AEDA has recently made a hydrological study of a site at Bichitur in Karbi Anglong District where a potential of generation of about 1.8 MW has been identified. The details and status of the small hydro projects identified by AEDA are presented in Table 3 and Table 4.

Table 1: Small Hydro Sites Identified by ASEB

Sl No	District	No. of Sites Identified	Total Potential, MW	Remarks
1	Karbi Anglong	45	80.90	1 (2 MW) commissioned but inoperative since 1993 2 (6 MW) under execution 1 (6MW) under execution but work suspended
2	NC Hills	26	29.20	
3	Sibsagar	2	15.02	
4	Nagaon	7	2.80	
5	Nalbari	1	3.00	
6	Cachar	2	2.50	
7	Sonitpur	3	4.05	
8	Darrang	2	20.20	1 (20 MW) under execution
9	Dibrugarh	4	1.30	
10	Kamrup	1	0.40	
	TOTAL	**93**	**159.37**	

Table 2 : Status of Small Hydro Projects of ASEB

Sl No	Name of the Scheme	District	No. of Unit x Capacity (No. x KW)	Status
1	Bordikharu	Karbi Anglong	4 x 500	Already Commissioned but inoperative since 1993
2	Dhansiri	Darrang	5 x 3 x 1330	Ongoing under execution
3	Lungnit – I	Karbi Anglong	2 x 1500	Ongoing under execution
4	Lungnit – Ii	Karbi Anglong	2 x 1500	Ongoing under execution
5	Dalaima	NC Hills	3 x 2000	Works suspended for paucity of fund & other reasons

Table 3 : Small Hydro Sited Identified by AEDA

Sl No	District	No. of Sites Identified	Total Potential, MW	Remarks
1	Karbi Anglong	3	1.90	DPRs prepared for 2
2	Kamrup	3	0.31	Commissioned - 2
	TOTAL	**6**	**2.21**	

Table 4 ; Status of Small Hydro Projects of AEDA

Sl No	Name of the Scheme	District	No. of Unit x Capacity (No. x KW)	Status
1	Kalmoni	Kamrup	2 x 50	Already Commissioned
2	Nazirakhat	Kamrup	2 x 5	Already commissioned as demonstration project
3	Thiapani	Kamrup	2 x 100	DPR prepared
4	Majar	Karbi Anglong	1 x 10.5	DPR prepared
5	Amlong	Karbi Anglong	1 x 90	DPR prepared
6	Bichitur	Karbi Anglong	1800	Survey & investigation completed

These data show that the district of Karbi Anglong has the largest small hydro potential, about 83 MW, so far identified followed by N.C. Hills district, 29 MW. Due to difficult terrain of

these two districts, the numbers of remote villages that cannot be electrified through conventional grid are also large - 818 in Karbi Anglong and 237 in N.C. Hills.

As such it seems the potentiality of tapping small hydropower in these two districts to electrify some remote villages is quite large. However, due to many reasons, especially due to lack of road communication in the difficult terrains, where most of these small hydro sites are located, the tapping of this resource has also become difficult.

STEPS TAKEN

Govt. of Assam has already taken the following steps to electrify the 2145 un-electrified villages, declared remote by ASEB, through non-conventional sources of energy, viz., small hydro, solar photovoltaic and biomass gasification:

- Three agencies, viz., ASEB, AEDA and Forest Development Agency (FDA), under coordination of Department of Power, Govt. of Assam, have been designated to implement the Remote Village Electrification Programme (RVEP) of Ministry of Non-conventional Sources of Energy (MNES), Govt. of India. These three agencies will implement the programme in 2145 remote un-electrified villages in the following break-up – ASEB in 1058 villages, AEDA in 920 villages, and FDA in 167 villages. Work of identification of the best sources and subsequent preparation of DPRs is in progress.
- A policy for small hydro power development up to 25 MW in the State of Assam has already been drafted and is in the pipeline for implementation to attract Independent Power Producers (IPP).