New Concept of Hydro-power Generation (Reservoir- Less) in North-Eastern India

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Abstract: Despite having a large potential in Hydro-Power generation, the region of North-Eastern India suffers from massive power outages due to less power generation capacity. Various factors are responsible for the current situation of NE i.e. dam construction not only causes alteration in the flow of river, it also affects the nature as well as creates a need of rehabilitation of people to another place. Constructing a dam not only requires large scale land acquisition, it is very costly as well as takes a lot of time for completion. Hence the state governments of this region are reluctant to construct dams.

This paper describes various problems currently faced in the region of North-East India regarding Hydro-Power generation and the techno-economic feasible solution which is a small-scale reservoir-less construction over the river which will not only be inexpensivebut will also be smaller in size and will have less negative impact on nature.

Keywords- North-East India- Perennial Rivers- Hydro-Power Generation (Reservoir-Less)- Development of the Region.

1. INTRODUCTION

The North-Eastern part of India known for its scenic beauty is also known for being one of the most under developed part of India. The major factor for this situation of the region is not having enough power generation. It is a fact that for the overall development of a region.

Continuous and adequate supply of power is important. In spite of having the highest potential of hydro-power generation, North-East suffers from tremendous lack of power supply due to an animus against dam construction in the society of NE. This has led to an economicslowdown in many states of the region due to lack of industrial commercial opportunities as these opportunities require huge amount of electrical power supply. Building dams can be a solution, but with a dam comes many problems such as acquisition of a large piece of land, rehabilitation of people in huge amounts from one place to another, long time duration for the construction, negative impact on nature like deviation in the flow of river or people living downstream not getting enough water for day – to day use.

Cost is also a major factor as a dam needs millions of rupees to be constructed. Hence building dams in this region does not seem a reliable solution for the deficiency of power supply. All these above mentioned can be easily taken care of if many small units of reservoir-less construction can be built on small rivers which will directly generate electricity from the natural flow of water, hence not effecting the flow of river as well as the nature and people living around.

Being small in construction, the cost and the time taken for the construction will substantially decrease and this problem regarding power generation in NE may be solved.

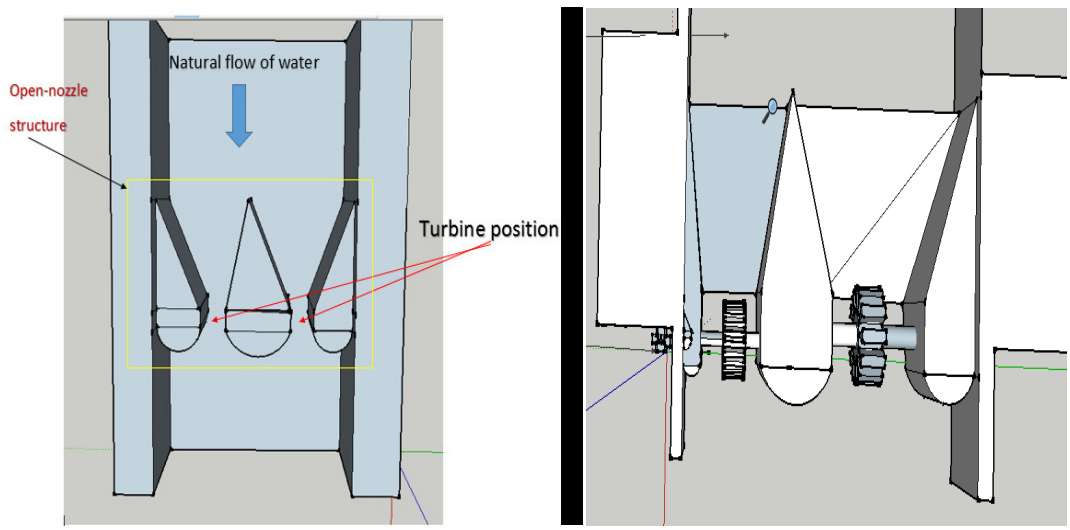
2. RESERVOIR-LESS CONSTRUCTION

As mentioned in the introduction, the problems of the dams can be solved out by having Reservoir-Less construction. In a reservoir less construction, power is generated naturally from the river. The construction is like an open nozzle, due to this type of construction the pressureand the velocity of the water at the end of the nozzle will increase without any construction of a reservoir.

With the use of a small slant angle and a few obstruction, the turbulence of water with very less velocity can be raised even with a very small or almost neglible head. The pressure hence created will be enough to rotate the turbine.

Many such small units combined together will produce a large amount power. The power generation fluctuation will be taken care of by, using inverters as well as controllers and with the help of small sub-stations this power supply can be integrated with the main grid.

3. STRUCTURE DESIGN



4. ADVANTAGE OF THE RESERVOIR LESS CONSTRUCTION

1. Small size construction.
2. Simple circuits.
3. Less maintenance hence the local people can be given training in order to look after these units gradually creating employment for the local population
4. Total construction cost will be very less
5. The employment generated will obviously help in economic prosperity of the local population hence helping in raising their living standards
6. Less dependency on the main land grid as this system can be used as a standalone system
7. As no dam is required to be constructed the problems related with construction will be taken care of.
8. Extra power generated can be sold to the utility grid supplier
9. The rivers needed will be in smaller in size.
10. Almost no impact on nature will be very less.

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