# Steps to Enhance Private Investment in Hydro Sector

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## *ABSTRACT*

*Although India has 1,50,000 MW Hydro Potential, but hardly 30,000 MW has been developed so far. Initially Government of India has been funding the development of Hydro Project from their budgetary support only. In 90s Government of India offered the various hydro sites for development for Private Sector. Although 10 years have been passed but there is a not significant addition in Hydro development from Private Sector. The main reasons are Environmental Issues, Hydrology, Geology and Regularity Issues*

*To enhance the investor interest in Hydro development it is necessary that project sites have to be offered by the State Government after doing initial development work like Preparation of PFR/DPR, Statutory clearances like environmental, techno economic clearances, open access, power purchase agreement and even ensuring availability of land without hassle. Thus a private investor should start construction without any problem*

*Accordingly, IL&FS Infrastructure Development Corporation Private Limited has come forward to join hands with various States Government by sharing risks and contributing financially in development of various Hydro sites in a time bound manner. The paper deals with the various risk and the problem areas encountered by private developers in developing HEP sites and also deals with various methodology being adopted in sharing Risk and Finance with States Government including arranging clearances so that a Private Party can go very fast in implementation of projects. Expenditure incurred on development of hydro sites is recovered in the form of capitalizing the same and also seeking success fee from the private implementer on competitive bidding process*

*The new methodology adopted has evoked a good response from the private implementers in development of the hydro sites)*

*In 1950, the total installed capacity of India was only 2300 MW, which went up to 1,34,000 MW. However, as the economy is growing, the requirement of Power has also gone up and urgent steps are needed to bridge the widening gap between demand and supply if the country is not to slip in the dangerous situation of Power starvation which will hamstring development efforts. In addition to peaking shortage, India is also facing the problem of system control due to predominant thermal. Presently, Indian power system has got 73:27 of thermal hydro mix against the system requirement of 60:40. Thus this imbalance has created system control problem.*

*India has potential of 1,50,000 MW hydro but so far only 33600 MW have been developed both by state/private sector which is only 22.4% of the total Hydro potential. In addition, 6800 MW hydro potential is in form of micro, small and mini projects and 94000 MW in terms of Pumped storage schemes. Thus there is need to harness hydro potential at a faster rate not only to correct their ratio but also to harness the clean, nature friendly and renewable energy potential, which cannot be stored like coal etc*

## 1 EFFORTS FROM GOVT. OF INDIA FOR LIBERALIZATION AND GLOBALIZATION

The year 1991 heralded a new era of economic liberalization. Major liberalization measures designed to affect the performance of the industrial sector, were-widespread reduction in the scope of industrial licensing, simplification of procedural rules, reductions of areas exclusively reserved for the public sector, disinvestments of equity of selected public sector, undertakings, liberalization of trade and exchange rate policies, reduction of customs and excise duties and personal and corporate income tax, etc.

Although various State Government's have allocated hydro power sites through MoU routes to private developers in 90s and thereafter, but due to various procedural problems, implementation of the sites was not on expected line. Private participation- currently very low at just 3% in Hydro sector.

## 2 MAJOR INITIATIVES TAKEN BY GOVT. OF INDIA TO PROMOTE HYDRO POWER

Government of India has also taken up various initiatives to promote Hydro Power and some of them are as below;

**i) PFRs of 50000 MW Schemes**

During 2003-04,Government of India under 50000 MW Prime Minister Initiative has completed the gigantic task of preparation of 162 PFRs of various sites, under the leadership of the author who was the then Member (Hydro) of Central electricity Authority. Although these PFRs gives a fairly good idea of locations but still lot of problem and geological surprises are not possible to identify from these PFRs.

ii) **Funding:**

To meet the large capacity addition envisaged in the state and central sector funding by earmarking funds in the plan allocation by planning commission and organizing supplementary funding of hydro project where more 50% of the expenditure has already been incurred.

iii) **Monitoring:**

Close monitoring by Central Electricity Authority & Ministry of Power including assessment of problem and their possible solution has been initiated.

iv) **Basin Wise Development:**

Government of India has now understood the need of basin wise development to optimize the potential.

v) **Advance action for 11th Plan and beyond:**

Government of India/Central Electricity Authority has identified major hydroelectric sites, which are expected to yield result in 11th and beyond plan.

vi) **Promoting Small & Mini Hydel Project:**

Ministry of Non-Conventional Energy Sources (MNES) is providing various incentives including for survey & investigation, preparation of DPR, soft loan, capital subsidy and other technical assistance upto 25MW planned. MoEF has liberalized rules for projects less than 25 MW capacity and no environment clearance required for projects less than 25 MW provided the project doesn't fall under restricted Zones.

vii) **Simplified procedure for transfer of clearances:**

Simple procedures have been finalized to transfer CEA's Techno Economic clearances to another developer along with environment & forest clearance etc

viii) **Rationalization of Hydro Tariff:**

Government of India is actively considering to give special tariff to the hydro sites particularly those are far of from load center and required to give support during peaking hours. Keeping in view the interest of the private developer a return on equity @ 14% has been assured.

ix) **Promoting Hydel Project with Joint Venture (JV):**

With a view to bring an additional private investment in the hydel sector, stress is being now given to bring in private equity through JV

## 3 CHALLENGES IN HYDRO POWER DEVELOPMENT

Keeping in view the experience, it is essential that problems coming on the way of harnessing the hydro potential be to be removed. Various problems/hurdles being faced by the developer particularly from private sector are discussed in the ensuing paragraphs.

Considering the fact that easy locations particularly where Geological conditions are better have been exploited particularly in South & West India. Presently challenge is to develop hydro resources in Himalayan belt, which are of comparatively poor geology and have silt problem. Due to obvious reasons construction period and cost of these sites, which are also having problem of infrastructure, will be higher. Various challenges in Hydro Power development are as below;

**a) Financial requirements**

Keeping in view development of 1,00,000 MW potential envisaged, with approx. US$ 1.3 mn per MW, capital cost US $ 150000 mn would require financing the Hydro Power Development. An Equity say 30% of the cost would be around US$ 45000 mn and Government alone cannot finance the same. Similar amount will be required for evacuation system and equal amount is anticipated for enhancing the distribution system.

**b) Evacuation System**

Evacuation System particularly from far away points from load center is a challenge to plan on techno commercial acceptable basis. Evacuation system from North East that has got maximum hydro potential in a hostile area with minimum infrastructure is a challenging task. The evacuation system will also face challenge due to different time frame of commissioning of hydro sites. Since these will not be commercially viable in normal planning methodology a special approach to attract fund will be required. Evacuation system particularly, from far away hydro center in North East to load center of Northern/Western/ Southern has to be properly planned in respect of its evacuation capacity and optimum cost.

**c) Clearances**

In Hydro Power Projects which are site specific and no off the shelf solutions are available, lot of clearances are required and the same causes delay in Hydro Power development. The various clearances involved in large sized projects are as under;

- Environment Clearances
- Forest Clearances

- Inter state aspects clearances from Center Water Commission
- Techno-economic clearance from Central Electricity Authority
- Local body clearances
- Land and water availability from state
- Geological clearances from GSI,
- Some additional clearances like Defence, International Issues, and TAC etc. are also required depending upon size and location of project

**d) Technical Expertise**

The hydro sector requires highly skilled manpower and in developing countries like India, there is a constraint of the sufficient number of technical experts.

**e) Non availability of data**

It is Hercules task to obtain Toposheets, Hydrology, Geological Reports, Survey of India Special Sheets and other details from the various Governmental agencies.

**f) Commercial Issues**

To attract financer for the project, it is essential that the project is techno commercially viable and PPA is in place.

In the absence of proper study and proper development of the project, financial closure of the hydro projects is difficult task particularly for the private developer. Similarly, getting concession agreement, local clearances and co-operation from concerned organizations in this sector is time & cost consuming.

**g) Lack of information on sites**

Initially the development work on the hydro sites was taken up on pick and choose basis without knowing the merits and demerits of the location. Although Government of India through Central Electricity Authority has carried out ranking study of 399 sites to identifying the degree of difficultly of various locations based on the certain parameters.

Various locations allocated to developers were based on the sketchy information collected by local departments. Some of the sites may face Geological, R&R and Techno commercial viability problems.

**h) Other Challenges**

Beside above long term finance, tariff related issues, poor contract management, geological surprises, inaccessibility of the area, land acquisitions delay, R&R issues and law and order problems in some of the parts are part of challenges.

It is therefore, necessary that before awarding the site for construction to any agency the position regarding various problems should be known. The risk has to be shared by the concerned state so that private developer is not faced alone to meet these hostile challenges.

## 4 IL&FS APPROACH FOR DEVELOPMENT OF HYDRO SITES

M/s. IL&FS has come across with the innovative procedure for development of hydro sites jointly with state governments and address all the pre-implementation issues and give complete Techno commercial

details to the developer along with the clearances so that the developer can start construction work just after allotment of site. The approach is described as below;

### 4.1 Valley Wise Development Approach

The complete valley is scanned to find out the optimum potential of that river valley including its tributaries. After identification of various hydro sites starting from small to Major, the Techno-Commercial assessment is done for each site. While developing the hydro potential integration of social aspects like drinking water schemes, Irrigation schemes, Fisheries and local development is also considered.

While developing the valley care is also taken to develop infrastructure of the area to enhance the communication system and also to train local unemployed youths so that there is a local participation in the development of the valley.

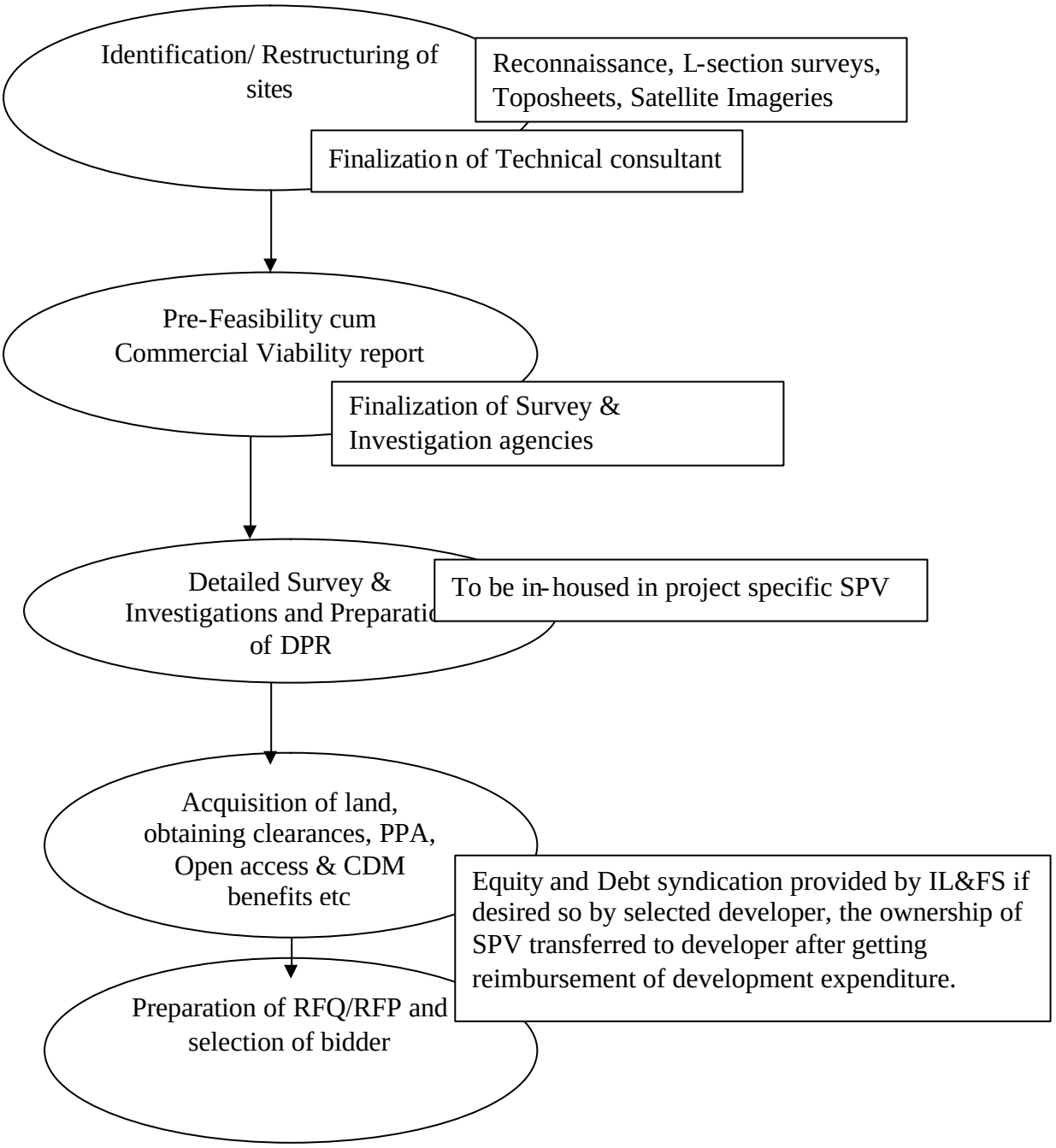
To optimize the valley potential, cognizance of existing sites, under construction and allotted sites is taken care of. Submergence levels are kept to avoid any major problem to the local population and submergence of existing infrastructure and historical places. Care is also being taken to ensure that water discharges are not wasted without power generation by rationalizing the height of dam and design discharges in the cascade formation.

The activities for development of above steps are taken care from a project development fund (PDF) created by equal contribution by IL&FS and its JV partner. Expenditure incurred on development of hydro sites is replenished through funds from private operator after the project is successfully bid out. The developer is selected through fair bidding process only.

It has been found that developers are very keen in the hydro sites, where pre-implementation activities have been completed.

A typical development cycle shown in the schematic diagram.

Fig 1 Development Cycle




## 5 IL&FS IDC HYDRO EXPERIENCE

IL&FS IDC has made valuable achievements within a period of last 2 years in various states. The following are case studies on BTAD, Assam and State of Uttarakhand;

**a) <u>BTAD, Assam</u>**

IL&FS IDC signed Joint Venture agreement with BTAD, Assam namely BIDC in Nov 06'.Presently there is no hydropower Project in the entire BTAD, Assam. The Champamati, Pahumara, Rupahi and Borolia are existing irrigation schemes in Bodoland Territorial Area Districts (BTAD). Part of the water is being used for irrigation and rest of the water is going waste. The sites were recognized as potential small hydro sites by IL&FS team and Work of preparation of DPR including survey work, land acquisition, PPA, Concession agreement and evacuation etc was completed in a record time of 12 months .The construction of champamati project has been started as the project was delivered ready to take off project. The initial fund has been replenished and is being utilized to develop other hydro projects on the BTAD and Bhutan Border by developing schemes having intake in Bhutan and Power House in India. Govt. has appreciated the approach and initiative.

**b) State of Uttarakhand**

IL&FS IDC after signing an agreement with Uttarakhand Government took up identification and restructuring work of hydropower projects in various valleys through JV co. named as **UIPC**. Approx. 2500 MW projects are under different stages of development and the approach adopted is valley wise development approach as explained above. As an example, Nayar Valley development is explained below;

**Nayar Valley**

British Geologist investigated this site in 1940s and after lot of studies and incurring huge expenditure, the site was declared geologically unviable site for 105 m dam. UIPC Hydro experts after studying the earlier reports restructured the project with 35 m high dam, which is now techno commercially viable. There is no hydropower project in the entire Nayar valley. UIPC has identified three small hydro projects and also restructured the earlier abandoned Nayar Dam Project. The total capacity in Nayar Valley will be 25 MW and will certainly help in prospering the entire valley due to integration of social aspects like Tourism, Fisheries, and Drinking water etc. All the projects will be bidded out by Dec-07 after completion of development cycle only.

## 6 CONCLUSION

Indian Power System has not been developed in a required manner and need hydropower potential development on fast track basis. The exorbitant fund requirement to meet the gigantic challenge cannot be met with the budgetary support of Centre/State Governments. A co-operation between government and private sector is essentially required to develop projects in a time bound manner. To facilitate smooth execution of the project it is necessary that government policy should be such that the private sector find easy approach in handling development of hydro sites since for individual developers, tackling various agencies for seeking clearances/information would be difficult. Hence a PPP format will be useful. IL&FS on the same pattern develops the project on commercial format. This innovative idea is gaining momentum due to its success.