STANDING COMMITTEE ON ENERGY

(2001)

THIRTEENTH LOK SABHA

TWENTY SIXTH REPORT

MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES

SMALL HYDRO POWER PROGRAMME – AN EVALUATION

Presented to Lok Sabha on 7.3.2002

Laid in Rajya Sabha on 7.3.2002

LOK SABHA SECRETARIAT
NEW DELHI

December, 2001 / Agrahayana, 1923 (Saka)

CONTENTS

COMPOSITION OF THE STANDING COMMITTEE ON ENERGY (2001)

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30. Vacant

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4.	Shri N.K.Jha	- Senior Committee Assistant

* Ceased to be Member of the Committee w.e.f. 1.9.2001 consequent upon his induction in Union Cabinet.

COMPOSITION OF SUB- COMMITTEE ON NON-CONVENTIONAL ENERGY SOURCES AND ATOMIC ENERGY OF STANDING COMMITTEE ON ENERGY 1998-1999

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13. Shri Ramashanker Kaushik
14. Shri S.M.Krishna
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COMPOSITION OF SUB- COMMITTEE ON NON-CONVENTIONAL ENERGY SOURCES OF STANDING COMMITTEE ON ENERGY 1999-2000

Shri Sontosh Mohan Dev - Chairman
Shri Vedprakash P.Goyal - Convenor

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8. Shri Ravindra Kumar Pandey
9. Shri Dalpat Singh Parste
10. Shri Chada Suresh Reddy
11. Prof. Ummareddy Venkateswarlu

COMPOSITION OF SUB- COMMITTEE ON NON-CONVENTIONAL ENERGY SOURCES OF STANDING COMMITTEE ON ENERGY 2001

Shri Sontosh Mohan Dev - Chairman
Shri Prakash Yashwant Ambedkar - Convenor

3. Shri Basudeb Acharia
4. Shri Gandhi Azad
5. Shri Dara Singh Chauhan
6. Shri Ramashanker Kaushik
7. Shri Ravindra Kumar Pandey

8. Shri Dalpat Singh Parste
9. Shri Chada Suresh Reddy
10. Prof. Ummareddy Venkateswarlu
11. Kumari Bhavana Pundlikrao Gawali

INTRODUCTION

I, the Chairman, Standing Committee on Energy having been authorised by the Committee to present the Report on their behalf, present this Twenty Sixth Report on the subject, "Small Hydro Power Programme- An Evaluation". The Standing Committee on Energy (1998-99) had selected the subject "Small Hydro Power Programme – An Evaluation" and entrusted the same to the Sub-Committee on Non-Conventional Energy Sources and Atomic Energy for examination and Report thereon. The Sub-Committee could not finish the task and their unfinished work was entrusted to the subsequent Sub-Committees on Non-Conventional Energy Sources of the Standing Committee on Energy pertaining to the years 1999-2000 and 2001.

2. The Sub-Committee held 5 sittings so for in all of which were devoted to taking oral evidences of the officials / representatives of the Ministry of Non-Conventional Energy Sources (MNES), Indian Renewable Energy Development Agency Limited (IREDA) and Power Finance Corporation (PFC).

3. The Sub-committee on Non-Conventional Energy Sources and Atomic Energy of the Standing Committee on Energy (1998-99) undertook Study Tour to Gangtok and Darjeeling during October, 1998 and held informal discussions with the representatives of Power Department, Government of Sikkim on the subject. The Sub-Committee on Non-Conventional Energy Sources of the Standing Committee on Energy (1999-2000) also undertook Study Tour to Bangalore, Coimbatore, Cochin and Goa during February, 1999 and held informal discussions with the representatives of the Karnataka Renewable Energy Development Agency Limited (KREDAL), Karnataka Power Corporation (KPCL), Karnataka Electricity Board(KEB), Tamil Nadu Electricity Board (TNEB), Kerala, Goa State Electricity Board, Goa Electricity Department and Irrigation Department, Goa. The Standing Committee on Energy (1999-2000) visited Kolkata and Port Blair during November, 2000 and held discussions with the officials of National Hydro Power Corporation (NHPC) and West Bengal Renewable Energy Development Agency Limited (WBREDA). The Sub-Committee on Non-Conventional Energy Sources of the Standing Committee on Energy (2001) undertook a Study Tour to Chandigarh and Shimla during June, 2001 and held informal discussions with the representatives of the Punjab State Electricity Board (PSEB), Punjab Energy Development Agency (PEDA), Himachal Pradesh Energy Development Agency (HIMURJA) and Himachal Pradesh State Electricity Board (HPSEB) in connection with the examination of the subject. The Committee wish to express their thanks to these organizations for appearing before them and furnishing the requisite information as desired by them.

4. The Committee also wish to thank in particular the representatives of the Ministry of Non-Conventional Energy Sources for expressing their free and frank views during the course of oral evidence and placing the requisite material as required in connection with the examination of the subject.

5. The Committee also wish to express their thanks to following Non-officials / Experts / Associations /Manufacturers who furnished the Memoranda for the consideration of the Committee:-

(i) Indian Small Hydro Power Developers Association
(ii) VA TECH Eacher Wyss Flovel Limited (Manufacturer)
(iii) Elpro Energy Dimensions Private Limited(EDPL)
(iv) Alternate Hydro Energy Centre (AHEC), University of Roorkee,
(v) ShriA.N. Singh,(Retired Chairman,CEA), Expert
(vi) Shri B.R.Jaggan(Technical Directorr, EDPL)

6. The Sub- Committee place on Non-Conventional Energy Sources considered and adopted this Reports at the their sittings held on 18th December, 2001. The Report was subsequently considered and adopted by full committee at the sitting held on the same date i.e. on 18.12.2001.

7. The Committee place on record their appreciation for the work done by the Sub-Committee on Non-Conventional Energy Sources of the Standing Committee on Energy pertaining to the years 1998-99, 1999-2000 and 2001.

8. For facility of reference and convenience, the observations and recommendations of the Committee have been printed in bold letters in the body of the Report.

NEW DELHI;
December 24, 2001
Pausa 3,1922(Saka)

SONTOSH MOHAN DEV,
Chairman,
Standing Committee on Energy.

REPORT
CHAPTER I
INTRODUCTORY

Energy is a critical input for economic development. India being a large developing country with a population of above one billion growing at a rate of about 1.6 per cent annually, GDP growth rate expecting to grow at over 6 per cent over the next 10 years required an energy growth rate of 9 per cent. Consumption of coal and petroleum fuels is projected to nearly double by 2010. India is also projected to become an imported petroleum fuel dependent economy. Conditions are thus compelling for India to attempt to meet its growing energy needs in a self-relient manner, through renewable energy in general and small hydro power in particular.

1.2 Energy from small hydro power is probably the oldest and the most reliable of all renewable energy sources; which can provide electricity for the rural, remote areas and hilly terrain in our country in a cost effective and environmentally benign manner.

1.3 Apart from providing power to the grid, these plants are attractive renewable energy sources of decentralized power in remote hilly areas isolated from main grids but endowed with hydraulic resources. The major advantages of SHP are:-

* Reliable, mature and proven technology.
* Can be exploited wherever sufficient water flows--along small streams, medium to small rivers, irrigation dam-toe/canal drop sites, etc. over descent heads as low as 2m. and above.
* Does not involve setting up of large dams or problems of deforestation, submergence or rehabilitation.
* Non-polluting, entails no wastes or production of toxic gases; environmentally benign.
* Limited initial investments and short gestation periods.
* Reduced transmission losses.

1.4 With careful planning and adoption of simplified and standardized designs, SHP installations are becoming increasingly competitive with thermal, diesel or gas based power generation

1.5 India has one of the World's largest irrigation canal network with thousands of dams. It has monsoon fed, double monsoon fed as well as snow fed rivers and streams with the perennial flows. In India, Water wheels were invented in 300 B.C. In Europe, the under shot water wheel was in use in the 5^{th} century A.D. for powering forging hammer. A small hydro electric station of 12.5 KW capacity was installed in the USA in 1882. The first small hydro power station in India of 130 KW capacity set up in Darjeeling in the year 1897 marked the development of Hydro Power in India. The Sivasamudram project of 4500 KW was next to come up in Mysore district of Karnataka in 1902, for supply of power to Kolar Gold Mines. Small hydro project of 1750 KW set up in 1908 is still operating at full load at Chaba in Himachal Pradesh with original machines.

1.6 India is geographically fortunate to have a significant potential of water resources for power generation, a very little proportion of which have so far been utilized. Small hydro potential upto 25 MW is estimated to be somewhere around 15,000 MW. The Ministry of Non-Conventional Energy Sources (MNES) has created a database which includes 4096 potential sites with an aggregate capacity of 10,071 MW.

CHAPTER - II

Assessment of Potential and identification of sites for SHP development

The broad estimates of potential available from SHP projects upto 25 MW has been assessed at 15000 MW. Identification and systematic detailed survey and investigation of all potential small hydro sites is a primary, important and critical component of small hydro project development. Based on information received from various States, Ministry of Non-Conventional Energy Sources (MNES) has created a data-base comprising of 3349 potential SHP sites, upto 3 MW capacity, with a total potential of 2852 MW. Central Electricity Authority (CEA) has completed a study in June 1997 on the potential of SHP projects between 3-15 MW. 662 sites aggregating about 5519 MW have been identified in this range. It is also estimated that there is a potential of about 1800 MW from projects between 15-25 MW. As part of UNDP-GEF Hilly Hydro Project, a detailed exercise was undertaken to prepare zonal plans for 13 participating States of Himalayan and Sub-Himalayan Region.

2.2 In 1989, when the subject of small hydro upto 3 MW capacity was transferred to MNES from Ministry of Power, the total installed capacity from SHP projects upto 3 MW was 63 MW. During the last 10 years it has risen to 219 MW. The subject of SHP between 3-25 MW has been transferred to MNES **w.e.f.** 29th November 1999. Since then, there has been an addition of about 68 MW in the installed capacity of SHP projects upto 25 MW.

2.3 When asked about the reasons for identifying sites upto 10,171 (2852+5519+1800) MW only, out of total potential of 15,000 MW and by what time, the remaining sites would be identified, the MNES in a note stated:-

> "The indicated 15,000 MW potential from small hydro power projects is a broad estimate assessed and is based on information from States and on various other sources. Identification of potential sites is an ongoing process. The Ministry has consolidated information about identified potential sites based study conducted by Central Electricity Authority (CEA), a table exercise undertaken by Alternate Hydro Energy Centre (AHEC), Roorkee and information received from various States. A data base has been created at AHEC of identified potential SHP sites up to 25 MW. So far, information about 4096 sites aggregating 10171 MW have been compiled. Identification of remaining sites is an ongoing process and the investigation cells of SEBs / State Hydro Power Corporations regularly undertake this task".

2.4 When the Committee desired to know whether the State Governments have undertaken hydel resource assessment, the Committee was informed that State Governments also undertake hydel resource assessment. The State Power Departments/ State Electricity Boards/ State Hydro Power Corporations normally have an investigation cell, which is entrusted with the responsibility of investigating new potential sites suitable for hydro power development. State wise SHP sites identified are given in **Table I.** State

Governments undertake setting up of small hydro power projects based on techno-economic viability of the project, availability of resources and allocations made to undertake SHP projects. In order to exploit the potential, the States have also started allotting sites to the private developers to set up SHP projects. In this direction, 13 States have already announced their policies to invite the private sector".

TABLE - I

STATE WISE DETAILS OF IDENTIFIED SMALL HYDEL SITES UP TO 25 MW CAPACITY

Sl.No.	Name of State	IDENTIFIED NUMBER OF SITES	Total Capacity in MW
1.	Haryana	22	30.05
2.	Himachal Pradesh	323	1624.78
3.	Jammu & Kashmir	201	1207.27
4.	Punjab	78	65.26
5.	Rajasthan	49	27.26
6.	Uttar Pradesh & Uttaranchal	445	1472.93
7.	Gujarat	290	156.83
8.	Madhya Pradesh & Chhatisgarh	125	410.13
9.	Maharashtra	234	599.47
10.	Andhra Pradesh	286	254.63
11.	Karnataka	230	652.61
12.	Kerala	198	466.85
13.	Tamil Nadu	147	338.92
14.	Bihar & Jharkhand	171	367.97
15.	Orissa	161	156.76
16.	Sikkim	68	202.75
17.	West Bengal	145	182.62
18.	Arunachal Pradesh	492	1059.03
19.	Assam	46	118.00
20.	Manipur	96	105.63
21.	Meghalaya	98	181.50
22.	Mizoram	88	190.32
23.	Nagaland	86	181.39
24.	Tripura	8	9.85
25.	A&N Island	6	6.40
26.	Goa	3	2.60
	TOTAL	**4,096**	**10,071.81**

2.5 When the Committee desired to know about the plan of action that had been drawn to commission SHPs at these sites, the MNES replied:-

"Ministry of Non-conventional Energy Sources is encouraging setting up of small hydro power projects throughout the country. Development of SHP is envisaged both through Government sector projects and through private sector projects. The Ministry is giving capital grant to support Government sector projects and interest subsidy for commercial projects being developed through the private sector. Apart from this, financial incentives are being given for detailed survey and investigation and DPR preparation. The Ministry is aiming towards a capacity addition of 800 MW during the 10th Plan period. The major emphasis to achieve this target would be through private sector participation. The SHP projects in this range are expected to be set up on the identified sites".

2.6 With the inclusion of hydel power plants upto 25 MW, MNES have launched a comprehensive State-wise study to identify the potential sites for small hydro projects. When asked, if the allocation of fund to MNES increased as a result of above broader mandate, the MNES stated:-

"Apart from the usual yearly increment in the plan allocations, the Ministry has not received any additional allocation as a result of the transfer of the subject of SHP between 3-25 MW. The Ministry had requested the Planning Commission for an additional allocation of Rs.100 crore for the 9th Plan period. However, no additional allocation has been received. For the year 2001-02, against a projected requirement of Rs.61 crore, the SHP programme has been allocated a sum of Rs.39 crore. The Ministry is projecting a requirement of Rs.678.50 crore for the 10th Plan period".

2.7 MNES is extending multi-dimensional support to the development of SHPs. The fiscal incentives available for the small hydro sector are as under:-

(a) Schemes involving capital upto Rs.50 crore need no environment and forest clearance from Ministry of Environment and Forest (MoEF).
(b) Five Years income tax holiday on grid inter-active power generation.
(c) Term loan through IREDA for schemes upto 25 MW.
(d) Excise duty exemption for electric mechanical equipments.

The additional incentives offered by MNES includes:-

(i) Promotional incentives schemes to carry-out Detailed Survey and Investigation (DSI) and preparation of Detailed Project Report (DPR).
(ii) Interest subsidy schemes for setting up of commercial SHPs specially in private sector.
(iii) Capital subsidy scheme for setting up of SHPs in State sector.
(iv) Scheme for Renovation and Modernisation and capacity uprating of SHP.
(v) Promotional incentive scheme for development and upgradation of water mills.

Schemes	Areas	Below 500 KW	500 KW upto 1 MW	Above 1 MW & upto 5 MW	Above 5 MW & upto 15 MW	Above 15 MW & upto 25 MW
Survey & Investigation	Plain	Upto Rs.0.75 lakh		Upto Rs.1.00 lakh	Upto Rs.1.50 lakh	
	Hilly	Upto Rs.1.00 lakh		Upto Rs.2.00 lakh	Upto Rs.3.00 lakh	
Detailed Project Report	Plain	Upto Rs.0.75 lakh		Upto Rs.1.00 lakh	Upto Rs.1.50 lakh	
	Hilly	Upto Rs.0.05 lakh		Upto Rs.1.00 lakh	Upto Rs.2.00 lakh	
Interest Subsidy for Commercial Projects	Plain	5.00%		2.50%	2.00%	1.50%
	Hilly & NE Region	7.50%		5.00%	3.00%	2.00%
Capital Subsidy for Government Sector Projects	NE Region, Sikkim	90% cost of the project upto Rs.75000/- KW	90% cost of the project upto Rs.60000/- KW	75% cost of the project up to Rs.45000/- KW	Equipment cost + 25% of civil cost limited to Rs.22.50 crore/project	Nil
	Middle Himalayas, Ladakh, A&N	Equipment cost + 50% of civil cost upto Rs.45000/KW		Equipment cost+25% of civil cost upto Rs.3.00 crore/MW	Euipment cost+25% of civil cost limited to Rs.15 crore/project	Nil
	Other Areas	Equipment cost+50% of civil cost upto		Equipment cost+25% of	Equipment	Nil

	(only notified hilly regions	Rs.30000/KW	civil cost upto Rs.1.5 crore per MW	cost+25% of civil cost limited to Rs.7.5 crore/project	
R&M of old Projects		Upto Rs.2 crore/MW		Limited to Rs.10 crore/project	Nil
Development /upgradation of water mills mechanical mode mechanical/electrical mode		Rs.30,000 Rs.60,000			

2.8 Furnishing the progress achieved under incentives for detailed Survey and Investigation (S&I) and Detailed Project Report (DPR) preparation, during each of the last 3 years, the Ministry in a note informed as under:-

> "Ministry of Non-conventional Energy Sources has so far supported 225 sites for Detailed Survey & Investigation (DSI) and 69 proposals for Detailed Project Report (DPR) preparation. The number of DSI & DPR proposals supported by the Ministry during 1997-98, 1998-99, and 1999-2000 are 54, 9, 16 respectively. The main reason for supporting only 9 projects during 1998-99 was that the scheme of DSI & DPR was under review. During the current year, so far 41 proposals of DSI and 14 proposals of DPR have been supported".

2.9 The Ministry has so far supported 74 proposals of DSI and 13 proposals of DPR for the projects developed by the private sector. Enquired about the reasons for low turn-over of private sectors in these schemes, the MNES stated in a written reply as under :-

> "It may be seen that 74 proposals of DSI has been supported by the Ministry in the private sector. Normally it takes about 18-24 months to complete the detailed survey and investigation for a new site. It is expected that the private sector developer would approach the Ministry for support for DPR preparation, once he has completed the survey. It may also be mentioned that for many sites, specifically on canals, firm water discharge data is already available in the Irrigation Department of the States and hence fresh detailed survey and investigation may not be required. In such cases, the private developers may not

approach the Ministry for its financial support. The Ministry's support for DSI is only given where a fresh survey is to be conducted"

2.10 When asked whether the MNES were satisfied with the level of support extended to Small Hydel Power Project under the scheme, they stated in a written reply as under:-

"Till April, 2000 the MNES support for DSI was upto Rs.1.50 lakhs and for DPR preparation was upto Rs.1.00 lakhs. The scheme has been revised in May, 2000. The support for DSI has been increased from upto Rs.1.5 lakhs to Rs.3.00 lakhs and for DPR from upto Rs.1 lakh to Rs.2 lakhs. The scheme has been extended to cover projects upto 25 MW. These incentives are considered satisfactory and are based on field experience The response of private sector has been satisfactory. The Ministry has supported 74 DSI and 30 DPR studies for the projects allotted to the private sector. Of these 44 DSIs and 21 DPRs have been completed".

Potential of Canal Based SHP

2.11 As per study conducted by CEA on SHP potential in India and data base at AHEC, 1407 sites with a potential of about 1565 MW have been identified for Canal Based SHPs. Project aggregating to about 375 MW (23%) have so far been set up.

2.12 Commenting on the Canal Based SHP, MNES in a note furnished to the Committee stated :-

"Canal based small hydro projects are low head and high water discharge projects. Both canal based SHP projects and run-of-the-river hilly projects have advantages as well as dis-advantages. The main advantage with canal based project is the accessibility of the site. In addition to this, the discharge of water is normally known and the projects can be designed accordingly. Since the discharge in canal is well established over a period of time, there is also no need to conduct discharge measurements for 2-3 years. The main dis-advantage with the canal based project is that the size of the turbine is very large as it has to handle large quantities of water with low head and hence the size of the power house becomes large. Such projects have very high firm power availability and do not require large investments in evacuation facilities. In the hilly projects, since normally the head available is high, the requirement of quantity of water is relatively small for the same size of project in comparison to canal based projects. The sites are remote in hilly projects and accessibility is normally very poor. The working season in the hilly projects is also normally less. These problems associated with canal based projects and hilly projects are inherent and natural. This is considered a part of developing the small hydro power sector."

2.13 Sharing their experience on Canal Based SHP, MNES informed that the experience of MNES in the development of canal based SHP projects has been particularly very good in the States of Andhra Pradesh and Karnataka. So far, 58 canal based projects have been set up in these two States. Some of the projects have been set

up in about 12 to 13 months. Once necessary clearances have been obtained, it is possible to execute the project in a relatively short time.

Due to Ultra Low Heads, the cost of equipment used for the generation of power through Canal Based Mini Hydro Projects (MHPs) in the State of Punjab and many other States having plain area, is higher. It discourages the participation of IPPs in the process of harnessing Canal Based Hydro potentials in the country. In the State of Punjab, 22 out of 50 projects have been cancelled due to lack of interest shown in them by IPPs. It is also learnt that no Capital subsidy is provided by the MNES for Canal Based SHPs in the State of Punjab, being plain area. When asked whether any subsidy/incentive schemes have been launched for the Canal Based SHPs, MNES in a note stated that they are providing interest subsidy for the canal based projects. In addition to this, the incentives for detailed survey and investigation and DPR preparation are also available. The Ministry is not providing any capital subsidy for canal based small hydro power projects. It is expected that configuration of SHP projects on canals would be so decided to make them economically viable of their own with the help of interest subsidy.

2.14 It further stated:

> "States, such as Punjab, Andhra Pradesh, Karnataka are now offering the potential SHP sites to the private sector. MNES interest subsidy scheme is applicable to the canal based projects also. As the canal based projects are attracting private sector investments, the Ministry is not providing any capital subsidy for private sector projects".

2.15 There is a vast SHP potential by way of return canals in the large number of thermal power stations, under the control of the State Electricity Boards (SEBs). Therefore, the Ministry had sanctioned demonstration projects in the State of Madhya Pradesh. This project which have been in operation, have given encouraging results. The National Thermal Power Corporation (NTPC) has also got studies done on the SHP potential at their Super Thermal Stations. When the Committee desired to know whether MNES have assessed the SHP potential that exist in the tail-end flow of water of mega-major thermal/hydro projects in the country, the MNES informed in a written note as under:-

> "MNES has not undertaken any study to assess the small hydro power potential at the tail end flow of water of mega/major thermal/hydro projects in the country. MNES have so far been concentrating on run-of-the-river/ canal based small hydro power projects. However, as per an assessment made by AHEC, 31 thermal power stations have been identified suitable for setting up of SHP projects using the tail end cooling water system. A separate provision was made in our earlier schemes for setting up of SHP projects on dam-toe sites. However, specific projects were not received from such sites."

2.16 Informing about the status of the demonstration project in Madhya Pradesh, the MNES stated:-

> "Ministry of Non-conventional Energy Sources has supported Satpura small hydro power project utilizing the tail end water of thermal power station. The project has an installed capacity of 1000 KW, utilizing the head of 2.34 m and discharge of 23.2 cumecs. The project was commissioned in March, 1996 with a total cost of Rs. 387.31 lakhs. Ministry has provided a capital subsidy of Rs. 118.8 lakhs. The project has an annual energy generation of 7.22 million units."

2.17 As regards, the details of the study undertaken by the National Thermal Power Corporation (NTPC) on the small hydro potentials at their Super Thermal Power Stations, the MNES stated:-

> "NTPC have prepared a detailed project report to set up a small hydro power project of 3 MW capacity at Singrauli Super Thermal power station. The project is proposed to utilize 85 cumecs of water and a head of 8 m. The project is expected to generate about 24 million units per year at a plant load factor of 95%. The DPR of the project is being finalized by NTPC in consultation with CEA. NTPC has also prepared feasibility reports to set up SHP projects at Ramagundam, Farakka and Rihand thermal power projects and are under finalisation."

2.18 It was further informed by the MNES:-

> "The idea of utilizing tail end/ cooling water of thermal power stations has been discussed by the Ministry with various State Electricity Boards and NTPC during various meetings. The economic viability of setting up such projects is the major consideration for SEBs. Also, setting up of such projects could change the already approved capacity/ configuration of the thermal power stations, which may further required separate infrastructural changes in the thermal power station and necessary approvals."

2.19 When the Committee desired to know whether Survey and Investigation of SHP potential had been taken up on an integrated river basin/canal system basis, the MNES replies as under:-

> "The investigation of SHP potential is normally taken up on an integrated river basin/ canal system basis only. The CEA study on potential of small hydro is entirely conducted on river basin/ canal system. Even some States have allotted SHP potential sites for investigation to the private developers river basin wise. However, investigations of individual sites are also carried out, wherever necessary. It may also be mentioned that historically the canal systems are so

developed that the potential to set up SHP projects may be exploited, whenever possible. However, this aspect has been brought to the notice of State Governments in various meetings that the future canal systems should be developed in such a way that more and more SHP projects can be set up. A number of SHP projects in Andhra Pradesh, Karnataka and Punjab have been recently set up utilizing drops in canals."

2.20 When asked if MNES provided any assistance to States for undertaking comprehensive Survey and Investigation and DPR preparation on river basin/ canal system basis, the MNES replied as under:-

"As per the present incentive schemes of Detailed Survey & Investigation (DSI) and Detailed Project Report (DPR) preparation, the Ministry is providing incentives for conducting DSI and DPR of individual potential sites. The Ministry has not provided assistance to States for undertaking comprehensive Survey and Investigation and DPR preparation on river basin/ canal system basis. MNES itself is not involved in preparation of project reports and clearances to offer them to the private developers. This is the responsibility of concerned State Governments."

Achievement under SHP

2.21 As regards the physical and financial targets set and achievements thereunder for SHP during the 8th and 9th Plan Period, it was informed to the Committee as under: -

"The target for SHP projects upto 3 MW was 50 MW during the 8th Plan and 130 MW during the 9th Plan. Against this, 51 MW SHP projects were set up during the 8th Plan and 72.79 MW SHP projects have been set up during the first three years of the 9th Plan. The subject of SHP between 3-25 MW was transferred to MNES on 29th November, 1999. During the period December, 99 to March, 2000, a capacity of 32.14 MW was added from projects above 3 MW. During the year 2000-01, a capacity of 89.10 MW was added from projects up to 25 MW. In total, a capacity of 193.93 MW have already been added from SHP projects in the first four years of the 9th Plan against a target of 130 MW. In financial terms, against a budget of Rs.81.00 crore during the 8th Plan period, an expenditure of Rs.82.09 crore was made. The 9th Plan outlay for the SHP programme is Rs. 137 crore. Against this, an expenditure of Rs.84.13 crore has been made so far, in the first four years of the 9th Plan. A budget provision of Rs.39 crore has been made for the year 2001-02. The targets for the 8th Plan and 9th Plan have thus been met for the small hydro power programme".

2.22 A target of capacity addition of 130 MW from small hydro power projects was fixed for the 9th Five Year Plan period. The physical and financial Targets and Achievements during 9th Plan is as under:-

Physical and Financial Targets and Achievements

The physical and financial targets for the small hydro power programme and the achievements during the first four year of the 9th Five Year Plan are given below:-

Physical Targets & Achievements:

Year	Target (SHP Projects in MW)	Achievement (SHP Projects in MW)
1997-98	10.00 MW	11.12 MW
1998-99	15.00 MW	28.15 MW
1999-2000	15.00 MW	33.52 MW
2000-2001	40.00 MW	85.10 MW*

* This includes SHP projects up to 25 MW station capacity

Financial Targets & Achievements:

Year	Target		Achievement
	BE	RE	
1997-98	26.00	7.00	20.03
1998-99	22.00	17.00	16.55
1999-2000	28.00	20.00	20.52
2000-2001	34.00	33.00	24.65 (as on 15.3.2001)

2.23 The Ministry has envisaged a target of 800 MW capacity addition during the 10th Plan period. At an average rate of Rs.4.00 crore per MW, this capacity addition would require an investment of about Rs.3200 crore. When the Committee desired to know about the sources of funding the SHPs during 10th Plan period, the MNES stated:-

> "Of this 800 MW capacity addition, about 200 MW are targeted to come through Government sector projects and 600 MW from commercial projects through private sector. While the resources for Government sector projects are expected from budgetary support, the private sector projects are expected to have investments from the private developers and various financial institutions. The Ministry has projected a requirement of Rs. 678.50 crore for the 10th Plan period to provide various financial incentives to the State Governments and private developers and also other activities for the small hydro power programme.
>
> IREDA has been able to mobilize International resources and a US $ 110 million second line of credit to support SHP projects is now operational. Further, IREDA would also leverage funds which are likely to be available for SHP sector also. The Ministry is also having continuous interaction with various international agencies and financial institutions to invest in this sector. The response has been quite encouraging and it is felt that resource may not be a constraint to support

economically viable SHP projects. The Ministry is also interacting with the Planning Commission to make necessary provisions in the State plans for setting up of SHP projects. It is also proposed to continue the Central Government incentives for the State projects and also for the private sector projects during the 10th Plan period".

2.24 The MNES has set long-term goal of 2000 MW capacity addition from small hydro power projects by the year 2012. This capacity addition is expected from SHP projects both in the State sector and the private sector. When asked about the perspective plan to achieve the said target of 2000 MW by the year 2012 A.D., the MNES stated:-

"These goal of 2000 MW has been projected in the proposed Renewable Energy Policy statement on the basis of the historic rate of growth and future projections in this sector. Broad contours of the policy have been drawn out. As a result, the 10th Five Year Plan proposed for the small hydro sector takes into consideration this goal and a target of 800 MW has been proposed for the 10th Five Year period. Further detailing will be done once the policy is proposed and the 10th Five Year Plan is finalized".

2.25 When asked how would the MNES achieve the target of 2000 MW capacity addition during the next 11 years particularly when only 156 MW capacity could be added during the last 10 years, the MNES stated:-

"In 1989, when the subject of small hydro up to 3 MW capacity was transferred to MNES from Ministry of Power, the total installed capacity from SHP projects up to 3 MW was only 63 MW. Today, the total installed capacity of SHP projects up to 3 MW is about 230 MW. There has been a fourfold increase in the installed capacity during this period. The Ministry is now responsible for SHP projects up to 25 MW. The total installed capacity of SHP projects up to 25 MW is about 1380 MW. There has been a capacity addition of 89 MW during the year 2000-01 from SHP projects up to 25 MW. In the future also bigger projects in this range are likely to be taken up in a big way thus adding to the existing capacity in a substantially faster manner. There is an increasing interest in the State Governments and the private sector to set up SHP projects, keeping in view the encouraging policies of the State Governments and the Central Government. With these experiences and achievements, the Ministry is aiming towards a goal of 2000 MW capacity addition by the end of 11th Plan period. If the State Government policies are conducive to set up commercial SHP projects through private sector and resources are available, the Ministry is quite optimistic of realizing its goal of 2000 MW capacity addition through SHP".

2.26 The Committee find that there exist a potential of 15,000 MW, in small hydel sector. However, the generating capacity of 1320 MW has been exploited. Taking into consideration the vast potential of SHP, sites aggregating to 10,171 MW have been identified by CEA, AHEC and State Governments and rest of the sites are under investigation. In the opinion of the Committee, the process of identification of sites, is rather tardy. The Committee desire that Government should formulate an action plan, so that the remaining sites could be identified expeditiously. The Committee would like to emphasise that Government should chalk-out a time bound programme to harness the estimated potential on priority basis.

2.27 The Committee observe that there is a need to assess the potential in the relatively untouched and untapped areas like tea-estates of the North-Eastern and Southern Region States, Tail-end flow of water of mega/major thermal/hydro projects, dam-toe sites of the major/small dams existed in the country and perennially running water through the snow-fed sources in the areas like Himachal Pradesh, Ladakh, Leh, etc. The Committee feel that the tea estates offer good scope for development of SHPs. The Committee recommend that tea estates be taken as a separate sector for the development and promotion of small hydro power. The Committee suggest that the Ministry of Non-Conventional Energy Sources should come up with attractive policies and programmes to make the investment in SHPs in the tea-estates sector more remunerative. In addition to this sector, the MNES should also make specific efforts to assess the small hydel potential in the other areas also as mentioned above.

2.28 The Committee note that the Ministry have set a target of 800 MW by the end of 10th Five Year Plan i.e. by 2007 A.D. and 2000 MW by the year 2012 A.D. To achieve these targets, the Ministry would require roughly an amount of Rs.3200 crore by the year 2007 A.D. and Rs.8,000 crore by the year 2012 A.D. by taking an average requirement of Rs.4.00 crore per MW. As of now, Rs.39 crore only has been allocated for the year 2001-2002 against a projected requirement of Rs.61.00 crore. The Ministry has projected a requirement of Rs.678.50 for the 10th Five Year Plan

period. As, the Government have set a higher goal i.e. 800 MW capacity addition by the year 2007 A.D. and 2000 MW by the year 2012 A.D. The Committee, urge upon the Planning Commission/Ministry of Finance to provide matching funds to the Ministry to meet the overall target of 2000 MW by the year 2012 A.D. The Ministry should also draft their own plan to achieve its physical and financial targets as fixed in the light of long term target of 2000 MW by the year 2012 A.D.

2.29 Detailed Survey & Investigation and Detailed Project Report preparations are the sine-qua-non for the development and promotion of small hydel sector in the country. Any inadequacies at this stage result in cost escalations on account of poor quality of collected data and delays in constructing civil works in difficult geographical terrain. These resulted in certain misgivings and misapprehensions in the mind of potential small hydro power developers. There is thus an urgent need to give due attention on Survey & Investigation and take adequate care while preparing the DPR for the small hydro projects. The Committee desire that high priority should be given to expedite the Survey & Investigation process alongwith DPRs preparations with the latest State-of-the-art technologies. The Committee feel that once DPR of a project has been prepared and approved by the appropriate authority, there may not be any need to have any statutory/non-statutory clearances for the project furthermore.

2.30 The Committee observe that the Ministry is providing incentives for conducting DSI and DPR preparation of individual potential sites. It has not been providing any assistance to States for undertaking comprehensive Survey & Investigation (S&I) and DPR preparations on river basin/canal system basis. The Committee feel that States should not be barred from getting assistance for undertaking comprehensive Survey & Investigation and Detailed Project Report preparation for the potential sites. Rather adequate financial support to undertake these promotional incentive schemes should be given to those States which desired to undertake SHP projects upto 25 MW. The Committee recommend that a shelf-

of-viable project alongwith approved DPR should be prepared and offered to the prospective developers at a reasonable price.

2.31 In order to cover the SHP projects upto 25 MW, the promotional incentive schemes of Detailed Survey & Investigation (DSI) and Detailed Projected Report (DPR) have been revised in May, 2001. The support for DSI has been increased from upto Rs.1.5 lakh to Rs.3.00 lakh and for DPR preparation from upto 1.00 lakh to Rs.2.00 lakh. Despite these incentives out of the total 225 Nos. supported for DSI and 69 proposals for DPR preparations by the MNES, these incentives only 44 DSIs and 21 DPRs could be completed by the private sectors. Thus, the Committee find that the level of private sectors participation in the promotional incentive schemes of DSI and DPR preparations is far from satisfactory. It is a major setback to the SHP programme launched by the MNES which is unable to muster enough support of the private sectors for DSI and DPR schemes. Furthermore, the Ministry have envisaged a target of 600 MW (out of 800 MW) during 10th Five Year Plan from commercial projects through private sector. It is next to impossible to achieve this target without the large scale participation of private sectors. Needless to say that private sectors participation at the installation level can be increased if their participation at the level of Detailed Survey & Investigation (DSI) and Detailed Project Report (DPR) preparation could be encouraged. The Committee, therefore, recommend that the Ministry should have a fresh look at the promotional incentive schemes of DSI and DPR so that the private sector may turn-up in a big way.

2.32 The Committee find that there are 1565 MW canal based SHP potential which constitutes more than 10% of the total SHP potential of 15,000 MW in our country. Out of this 1565 MW, SHP projects aggregating to about 375 MW which is about 23% of the total canal based SHP potential have so far been installed. The Committee note that canal based SHPs do not require various statutory clearances as are required in the case of other SHP projects. Furthermore, these also do not require much investment in DSI and DPR preparation. The Committee, therefore desire that the pace of harnessing the assessed canal based SHP potential should be

expedited on priority basis. The Committee further note that clusters of small hydro sites can be developed on the perennial canals like Bhatinda and Abhohar and in the catchment areas of perennial rivers like that Ganges the Brahamaputra, the Godavari, etc. The Committee also learn that CEA have listed the potential sites, river basin-wise and canal system-wise. The Committee recommend that such clusters of canal and river basin based SHPs should also be harnessed expeditiously.

2.33 The Committee note that the cost of the equipments used in a SHP project in the plain areas where the slope is very low, is higher. Due to ultra low heads, it requires larger size of the turbines which, in turn, expands the size of the power house. The cost of the project is thus further got escalated. The result is that the IPPs are withdrawing their support from these projects. For instance, 22 out of 50 canal based projects have been cancelled only in a single State of Punjab. The condition further worsen due to non-availability of capital subsidy in the plain areas like Punjab, Haryana, etc. The Committee further note that capital subsidies is being provided in the North-Eastern Region including Sikkim and in the hilly areas on the ground of higher installation cost of the project due to difficult geographical terrain. The reasons may be different but the point is that the installations cost of canal based SHP projects in the plain areas is also higher. The Committee, therefore, recommend the extension of capital subsidy to the canal based SHP projects in the plain areas also.

CHAPTER - III

Problems Associated with the Development of SHPs

The mechanism available for obtaining various clearances and approvals for power projects are cumbersome and time consuming. In many cases the details of procedures for obtaining clearances are also not clearly spelt out and thus a lot of time is wasted in these activities. When the Committee desired to know the details of statutory clearances required for Small Hydel Power Projects, the Ministry stated that statutory clearances required to set up SHP projects vary from State to State. However, following are the main statutory clearances required for setting up of SHP projects:

i) Techno-economic clearance by State Electricity Board/Power Department .
ii) Allotment of land by the State Revenue Department.
iii) Environment clearance by State Pollution Control Board (for projects costing upto Rs.50 crore) and by MoEF, GOI (for projects costing above Rs.50 crore)
iv) Forest clearance by Regional Director, MoEF, GOI
v) Water rights by State Irrigation Department

3.2 When further asked about the ideal time in according statutory clearances, it was informed that ideally the statutory clearances should not take more than 6-7 months. However, in practice it is observed that they take about 12-15 months".

3.3 When the Committee enquired whether in view of the changed scenario, do we need plethora of such clearances, the MNES in a note stated:-

> "Keeping in view that small hydro power projects are environmentally benign and are renewable in nature, development of such projects should be encouraged. SHP projects say up to 5 MW or so may be free from almost all clearances. There may not be any need for techno-economic clearance by the State Electricity Board for such projects. Only an agreement and PPA should be sufficient for a private developer to set up the project. SHP projects should be free from pollution/ environment clearance. Once a project is allotted by the State Government to a developer, clearance regarding water rights should be automatic. MNES has been suggesting to the State for a 'single-window clearance' in order to reduce the time required for clearances and streamlining the procedure."

3.4 When the Committee desired to know the reasons for the clearances sought from pollution control board in regard to the development of SHP particularly when they do not cause any pollution, the MNES stated as follows:-

> "According to Ministry of Environment and Forest, the hydro-electric projects may not create air and water pollution but they disturb the inter-relationship which exists among and between water, air and land and human beings, other living creatures, plants, microorganisms and property. Due to this reason, this activity has been brought under the provisions of Environment Impact Assessment (EIA) notification 1994. This matter was taken up with MOEF and as a result, SHP projects whose cost is less than Rs.50 crore have been exempted from obtaining environment clearance. This would approximately cover SHP projects upto 10-12 MW. Irrespective of the size of the project, if any forest land is involved, forest clearance has to be obtained under Forest (conservation) Act, 1980".

3.5 It was further informed that MNES had earlier taken up the matter regarding exemption of environment and forest clearance for non-conventional energy based power projects with Ministry of Environment and Forest under the provisions of Environment Impact Assessment (EIA) notification 1994 and Forest (Conservation) Act, 1980. As a result of this, power projects costing less than Rs.50 crore are exempted from

environment clearance. However, the request of exempting forest clearance for small hydro projects was not agreed to by MoEF. Since the subject of SHP upto 25 MW has now been transferred to MNES, it is proposed to take up the matter with MoEF to cover this range of SHP projects also. Echoing the sentiments of the Committee, the MNES also desired as under:-

> "It will be quite useful if the State Governments are empowered to give forest clearances and transfer of a limited extent of forest land required for setting up of SHP projects".

3.6 On the question of penalising the erring Government agencies for failure to accord statutory clearances within a given period, the MNES quipped:-

> "It may not be practically possible to impose penalties on Government Agencies for not providing statutory clearances within a given time period. However, it is necessary that a specific timeframe is fixed for providing the statutory clearances, after which a high level committee may be empowered to clear the proposal. If the timeframe is known for getting the clearances, this can be suitably incorporated in planning the execution of SHP projects".

(i) Allotment of Land

Clearances requirement for procurement of land, especially forest and Government owned land is the single most important issue in the SHP development. There is inordinate delay in implementation of project due to time taken for obtaining forest clearances and transfer for leasehold rights on land.

3.7 When asked about the reasons for delay in allotment of land and how can the MNES simplify the procedures for land settlement so that the time required could be reduced, the Ministry in a written reply stated as under:-

> "The land where SHP projects are proposed to be set up, may either belong to the State Government or it may be private land. In case of Government land, an assessment is made by the local Revenue officials about the quantity of land required followed by approvals at District level. Based on the assessment and rate, the amount is to be deposited with the State Government. In case of private land, a suitable rate of compensation is to be fixed and the land is purchased. Many times there are more than one owners of the land required for the project. Settlement of rights and also the rate leads to delay in finalising the matters relating to land required for a project".

3.8 Asked about MNES suggestion for simplifying the procedure for land acquisition/allotment, they explained as under:-

> "The present procedure of procuring land for small hydro power project do take considerable time and affect timely implementation of some SHP projects. It is

felt that if the land required for the project is first procured by the concerned State Agency responsible for SHP development and then the site is allotted, this procedure can be simplified and reduction in time is possible. Alternatively, the State Agencies can send advanced intimation to the District authorities regarding allotment of a particular site to the developer with a request to help in transfer of land on a priority basis. Since in many cases in the hilly regions, tribal lands are involved, the procedures of obtaining land clearance are even more cumbersome and time consuming".

3.9 On the question of the acquisition of land under section 17 of Land Acquisition Act, the MNES informed as under:-

"Section 17 of the Land Acquisition Act, 1894 provides for special powers of acquiring land in case of urgency on the direction of the Government. This Act is normally invoked for land urgently needed for public purposes. While it may be possible to invoke this Act for Government projects, for private sector commercial projects its use would have to be decided by the State Governments and the Land Acquisition Collectors keeping the various provisions in mind".

3.10 When asked whether the private developers are allowed to mortgage the Government land leased to them for project development for raising finances from Financial Institutions (FIs) , it was informed:-

"Now in many States like Andhra Pradesh, Karnataka, Himachal Pradesh the private developers are allowed to mortgage the Government land leased to them for project development for raising finances from financial institutions".

(ii) Royalty on Water

3.11 Before taking up a SHP, an entrepreneur is required to obtain clearances from State Authorities in respect of Water rights from State Irrigation Department. Small hydro projects do not consume water rather it improves the quality of water. When asked as to what efforts Ministry of Non-Conventional Energy Sources have made to convince the State Government /UTs to exempt Small Hydel Power Project from levying of water royalty, the MNES replied as under:-

"Ministry of Non-conventional Energy Sources have been suggesting to the States that there should be no royalty on water utilized for Small Hydro Power projects as there is no consumptive use of water in these projects. The water royalty has been exempted in the States of Karnataka, Himachal Pradesh, Madhya Pradesh, Punjab, Tamil Nadu, Orissa and West Bengal for 15 years upto 3 MW . The matter is being followed with other States to exempt Water Royalty for SHP projects".

3.12 During the Tour of the Sub-Committee to Bangalore, the representative of State Government of Karnataka justifying the imposition of Water Royalty, informed the

Committee that royalty on Water has been levied by the State Government, as they have created infrastructure like dam, anekut or canal. The royalty is required to maintain the infrastructure. The Government of Karnataka has waived Water Royalty for SHP upto 20 MW **w.e.f.** 1997.

(iii) Power Purchase Agreements (PPAs)

3.13 PPA, the most vital link between the concept to commissioning of the power project, has been the largest single hurdle in the way of the development of SHP in the most potential States. There are delays in signing of PPA and allotment of sites in certain States. Despite repeated efforts, the situation has not improved further. In the most potential small hydro States like Uttar Pradesh, and Himachal Pradesh, PPAs have not yet been signed even for MoUs entered into 5-6 years back. PPA should broadly ensure (i) entrepreneurship of a developer, (ii) a reasonable return on investment to the developer commensurate with the cost-benefit and risk – benefit ratios of the project, (iii) a reasonable pay back period, (iv) a reasonable payment terms either by an escrow account or by a Letter of Credit, (v) the structure of PPA may be reviewed on 3-5 years basis with the pace of development of this sector.

3.14 In order to cut delay occurring in regard to finalisation of Power Purchase Agreement, the Ministry of Non-Conventional Energy Sources were asked to frame a model PPA and circulate to all the States for adoption and implementation, the MNES, in turn, replied as under:-

> "Ministry of Non-conventional Energy Sources has already issued guidelines to all the States regarding wheeling, banking, third party sale and purchase rate of power from renewable energy based power projects. 13 States have already announced their policies for private sector participation to set up SHP projects. They have also drawn their own Power Purchase Agreements (PPA) taking into consideration various provisions in their respective States. MNES has got prepared a model PPA by drawing experience from the existing PPAs in various States. It can serve as a base document for drafting PPA in the States. It has not been circulated to the States. However, a few States have taken its copy for broad reference".

(iv) Development of Infrastructure including Evacuation of Power

3.15 The growth of SHP has been hampered due to lack of evacuation facilities. Commenting on the need to have an action plan to evacuate power, MNES in a note stated that creating proper evacuation facilities to evacuate power from SHP projects is one of the most critical element in the economics of SHP project. This problem is not so critical on canal based projects as normally they are located in a well connected area and power evacuation facilities are available within a reasonable distance. This problem is critical in the hilly areas. The projects are normally located in remote areas and the inter-connecting sub-station may be at large distances. The cost involved in drawing transmission lines becomes dis-proportionate to the cost of the project. If the cost of

transmission lines is included in the cost of the project then the project becomes economically unviable. MNES has taken up the matter with the potential hilly States such as Himachal Pradesh, Uttaranchal, etc. They have been asked to prepare a plan of creating proper evacuation facilites, specifically linking the issue with future private sector projects. The State of Himachal Pradesh had constituted a task force in this regard and the task force has also submitted its report. Similarly, Government of Uttaranchal has also prepared a plan for development of suitable transmission network with a view to develop SHP projects.

3.16 The main issue in implementing these plans is availability of financial resources. MNES has discussed the matter with these States and also with financial institutions such as REC, PFC, etc. to explore the possibility of mobilizing finances for these activities. It may be mentioned here that development of sub-transmission and distribution networks including evacuating facilities are the responsibility of concerned State Government.

3.17 In regard to inclusion of infrastructural cost such as transmission line, evacuation facilities, as a component of project cost, MNES informed the Committee that major infrastructrual cost such as cost of transmission lines, evacuation facilities are normally not included in the project cost considered by the Ministry for the purpose of capital subsidy. However, cost of the project include the cost of switchyard associated with the SHP project. MNES has received proposals from Himachal Pradesh State Electricity Board & Uttar Pradesh State Electricity Board to strengthen their existing transmission networks. However, at present MNES has no such scheme to support this activity.

3.18 On a suggestion to tap resources for recently launched Accelerated Power Development Programme (APDP) for financing infrastructure, the MNES stated as under:-

> **"**Under the APDP programme, funds are meant to be utilized against specific power projects/ schemes to be implemented by concerned State utilities/electricity departments to cover up-gradation of sub-transmission and distribution network including energy accounting and metering and for renovation and modernization of old power plants. It is the intention of the Ministry to access funds from the APDP scheme for the SHP projects as well and for this the State Governments have been requested in the Annual Conference of the Ministry held in 2001 to send specific proposals to MoP/PFC for APDP funding. The States/SEBs are expected to approach Ministry of Power directly with specific proposal. MNES has so far not received any concrete proposals to be considered/forwarded for APDP scheme".

(v) Lease Period (LP)

3.19 There is a wide difference amongst States in regard to lease period for Small Hydel Power Projects. For instance, the lease period in Karnataka is 40 years whereas it has been reduced to 13 years in the State of Kerala. Keeping in view the overall viability

of SHP projects, a practicable and uniform lease period is required, say 30 years be fixed. In this context, MNES have replied as under:-

> "When it came to the notice that the State of Kerala is restricting it to 13 years only, the Ministry suggested to the State to keep it at a minimum of 30 years, keeping in view the over all viability of SHP projects. Most of the States, where the policy for private sector participation to set up SHP projects have been announced, are keeping the lease period at about 30 years".

(vi) Third Party Sale (TPS)

3.20 It is a common fact that promoters feel comfortable for ensured pay back with private customers compared to some SEBs. But in the absence of a model PPA, there is a need for a provision which permitted 'third party sale' in States. However, there is no uniformity as far as the sale of power to third party is concerned. For instance, whereas Karnataka has allowed third party sale of power, it has been prohibited in other States. When asked about the steps taken by the Ministry of Non-Conventional Energy Sources taken in this regard, the Ministry in turn, replied as under:-

> "The Ministry strongly feels that third party sale should be allowed for the power generated from all renewable energy sources. Accordingly, the guidelines issued by the Ministry recommends the third party sale of power. This issue was discussed in depth during the Annual Renewable Energy Conference on "Policy Perspectives –2000-2012" held on 23-24th May 2000. It was stressed upon all the States to announce their policies as per MNES guidelines. It has been seen that whichever State has a good power purchase policy in place, it attracts a lot of investors in this sector".

(vii) Gestation period of SHP

3.21 When enquired about the time required for the execution of a SHP, the MNES, replied as under:-

> "The time period required for execution of a small hydro power project mainly depends upon the location of the project and the working period available to work at the project site. In certain remote locations in hilly areas, the working period is sometimes as less as 5-6 months due to snow and rains. There are no proper approach roads and the construction material may have to be transported from long distances. At such locations the execution of project may take even 3-4 years. However, small hydro power projects on canals should not normally take more than two years, once necessary statutory clearances are obtained. The MoU signed between the State Governments and the developers for execution of small hydro power projects normally indicates a specific time period within which the project is to be completed. If the project is not completed within this timeframe, the project is liable to be cancelled".

(viii) Single Window Clearance System

3.22 In order to obtain speedy clearances for the small hydro projects a 'Single Window Clearance' concept fixing responsibility on one single agency for obtaining all necessary clearances within State was suggested. However this system seldom operates and the promoter has to run from one window to another for clearances required for setting up small hydro projects. For projects which can be developed in 2 years period, one have to wait for years to get the approvals. Despite various efforts made by the Government, the 'Single Window Clearance System' for allotment of sites for SHP developers has not yet been fully adopted by the State Governments.

The State of Himachal Pradesh has recently adopted a simplified system for allotment of sites, implementation agreement and PPA. While some efforts were made in this direction by the States of Karnataka and Andhra Pradesh, the system was not fully adopted. The Ministry is continuously pursuing with the State Governments to adopt this approach in order to cut short the procedural delays. This issue was again discussed in detail during the Annual Renewable Energy Conference held with all the States during 31st May – 1st June, 2001 and the States have once again been requested to set up this system.

3.23 Explaining the reasons given by various States for non-implementation of 'Single window Clearance System', the MNES stated:-

> "The State Governments agree with the concept of "Single window clearance". The State agency responsible for SHP development is expected to implement this concept. While implementing this they in turn have to take clearances from many departments and the effectiveness of expediting the clearances is diluted. It also becomes practically difficult to empower a single agency to provide all clearances as many Departments of the State Governments are involved and approving authorities are different".

(ix) Insurance Cover

3.24 Like many other projects, small hydro projects are also subject to many foreseen and unforeseen risks, when asked if there is any insurance cover is available, the Government in their written reply stated as under:-

> "Various Insurance Companies do provide insurance cover for small hydro power projects. The equipment manufacturers supplying the equipment to the developers insures the entire equipment. The Insurance Companies also provide insurance of the civil works against natural calamities".

(x) Memorandum of Understanding (MoU)

3.25 When the Committee wanted to know about the ideal route **i.e.** MoU route, competitive bidding or tariff based to be followed by the Ministry, they replied as under:-

> "At present the State Governments, after identification of potential sites, advertise the sites inviting the private developers to set up SHP projects. The requests received are examined based on technical and financial capability of the applicant. The allotment of sites are done by a high level committee followed by signing of Implementation Agreement & PPA. The Ministry feels this is the optimum way of proceeding at this stage. However, after gaining some more experience in a few years, it may be useful to switch over to tariff based allotment of sites".

(xi) Operation and Maintenance

3.26 Our Himalayan and Sub-Himalayan regions are full of small hydro potentials. In such hilly regions, where the logistics are difficult, and the support services and maintenance are equally challenging, it is important that the local people are involved from the beginning in the setting up of the schemes and that the local manpower is trained suitably for operation and maintenance. Echoing the same feeling, the MNES expressed their views as under:-

> "It is extremely important that local people/local bodies are involved in the development of small hydro power projects, especially those located in remote and inaccessible areas. MNES has always been suggesting this to the State Agencies to involve local people and also train them for operation and maintenance. This has been done in some small size SHP projects in UP. The approach can make small size SHP projects sustainable and viable in the long run".

(xii) Apex Organisation for promotion of SHP

3.27 No programme can succeed without institutional support. The need for an apex institution at the center has been felt by the promoters of small hydel sectors in the country. This has already been recommended by the Standing Committee on Energy (1999-2000) in their earlier Report No.2 on DFG (2000-2001) of 12th Lok Sabha), . With the inclusion of 3-25 MW hydel projects into the small hydel sectors, the need for an apex institution for harnessing small hydro power in the country got intensified. In addition to requirement of trained manpower in the field of SHP, there is a need to have a good laboratories dedicated for the exclusive research and development (R&D) relating to the small hydel sector in the country. When asked about the views of the Ministry on the requirement of an apex organisation for harnessing the SHP potential in the country, the Ministry furnished their reply in writing as under:-

> "Development of Small Hydro Power projects in the States are normally done by the State Electricity Boards or by the State Hydro Power Corporations, where ever they are existing. The SEBs or Hydro Corporations normally have sufficiently good infrastructure to set up SHP projects. In some States small size

SHP projects are also set up by the State Agencies responsible for development of renewable energy. An apex organisation like NHPC would certainly help in the faster and dedicated development of small hydro power projects. However, in the absence of such an organisation, MNES is interacting with NHPC and NEEPCO to involve them in the setting up of SHP projects and related activities".

(xiii) Rate of Escalation

3.28 The rate of escalation is the bone of contention between Electricity Boards and power utilities as far as small hydel power projects are concerned. When asked about the steps proposed to be taken in this regard, the MNES replied as under:-

"MNES has recommended an Annual Escalation of 5% on the rate of the purchase of power from Renewable Energy based power projects. Most of the States are not agreeing to this for the power produced from small hydro power projects. They feel that since there is no fuel cost associated with power generated from SHP projects, escalation may not be necessary. The Ministry has recommended this keeping in view the overall inflation and cost of operation and maintenance of SHP projects. This was reiterated in the Annual Renewable Energy Conference with the States. The Ministry proposes to take up the matter with the Electricity Regulatory Commissions also".

(xiv) Energy Management Centre and SHPs

3.29 Energy Management Center in the State of Kerala has drafted master plan approach for assessing and preparing a Small Hydel Power Project to prepare development strategy for the State. The steps undertaken by the Ministry of Non-Conventional Energy Sources to promote Energy Management Centre like agencies for the development of Small Hydel Power Project in various States/UTs, are as under:-

"The efforts made by the Energy Management Center in the State of Kerala in drafting the master plan approach for assessing and preparing the development strategy of small hydro power projects in the State is quite encouraging. The Ministry proposes to encourage similar agencies in different States for faster development of SHP projects. Alternate Hydro Energy Center, University of Roorkee is another institution involved in similar work. They are also helping some other States in identification of potential sites and their survey etc. Assistance is being given to support initiatives like this".

(xv) <u>Central Excise and Other Duties exemption</u>

3.30 As regards the Central Excise and other Duty Exemptions available for Small Hydel Power Project equipment as compared to other non-conventional energy equipments, they informed:-

"The small hydro power project equipments attract 16% Central Excise. The SHP equipment has high indigenous component and hence it was considered necessary to have the excise duty to enable the manufacturers avail the MODVAT benefit. This was done on the request of the manufacturers. The goods imported by a manufacturer or supplier, for manufacture and supply of machinery and equipment to a power generation plant has concessional customs duty of 5% + surcharge + AD + SD. The 100% accelerated depreciation, as available to other renewable energy based devices/projects is not available to SHP projects. This was taken up by MNES with Ministry of Finance. However, this was not agreed, as most of the equipment like generators, control systems etc. are commonly used in other power projects also".

(xvi) Cent-per-cent accelerated depreciation

3.31 It was brought to the notice of the Committee that 100% accelerated depreciation is not allowed to SHPs. When asked if the matter was taken up with the Ministry of Finance, the MNES replied as under:-

"100% accelerated depreciation, as available to a few other renewable energy based devices/projects is not available to SHP projects. This is taken up by MNES with Ministry of Finance regularly . However, this has not been agreed to, as most of the equipment like generators, control systems can be commonly used in other power projects also. While it may be helpful for the growth of SHP sector to have the benefit of 100% depreciation, in view of the position explained by Ministry of Finance, the matter is not being vigorously followed up in the light of the practical difficulty indicated by the Ministry of Finance-

(xvii) Priority Sector Status

3.32 When asked if the MNES have taken up the matter with the Ministry of Finance/Reserve Bank of India for granting priority sector status for the development of Small Hydel Power Projects, they replied as under:-

"It will be extremely useful if the SHP sector is declared as priority sector for the purpose of granting loans by the financial institution. MNES has taken up this matter with the Ministry of Finance for extending this benefits to all the sectors of renewable energy including SHP".

(xviii) Industry Status

3.33 When the Committee desired to know if MNES have taken up the matter with Ministry of Finance for granting industry status to the SHP sector, they replied as under:-

"The incentives/concessions offered to an entrepreneur for setting up an industry in backward and remote areas vary from State to State. This is governed by the State policies in this regard. They are normally given land at concessional rates, rebate in sales tax, water and electric power. Power projects including small hydro

power projects are not given industrial status. However, the States of Madhya Pradesh, Punjab, Haryana, Rajasthan and Maharastra are extending sales tax benefits for the equipment used in SHP projects".

3.34. The Committee note some efforts have also been made by States of Karnakata and Andhra Pradesh in pursuing the concept of 'Single Window Clearance'. It has been informed to the Committee that the State of Himachal Pradesh has recently adopted a simplified system for allotment of sites, implementation agreement and PPA. However, in most of the States, no much headway has been made in accepting 'Single Window' mechanism, due to variety of reasons. The Committee desire that a High Powered Committee be constituted involving all the departments / agencies for expediting the clearances, in a fixed time bound manner. In the event of expiry of such a fixed period, the clearances should be deemed to have been accorded. The Committee also recommend that the relevance of various clearances should be reviewed and the list of clearances should be minimised so that the involvement of various agencies can be minimised.

3.35 The Committee note that the present procedure for acquisition of land is time consuming and quite cumbersome. It is beyond the means of the private developers to get the land which belong to either the State Government or to a private person. The Government support is, therefore, essential to expedite the process of acquiring land belonging either to the State Government or a private person for the promotion and development of small hydel sector. In this connection, the Committee desire that the concerned State Agency responsible for the development of SHP should acquire the land first by itself, and then allot the site to the IPPs. In extreme cases when the project is delayed inordinately, the section 17 of the Land Acquisition Act, 1984 may be invoked which confers special powers of acquiring land in case of urgency on the direction of Government.

3.36 The Committee are happy to find that some States namely Andhra Pradesh, Karnataka and Himachal Pradesh have permitted the private developers to mortgage the Government land leased to them for the project for raising finance

from various financial institutions. The Committee would like MNES to take pro-active role in the matter so that other States/Union Territories also allow this facility to IPPs.

3.37 The Committee find that Water Royalty is being levied in some of the States, even though there is no consumptive use of water. The Committee further note that it has been exempted in the States of Karnataka, Himachal Pradesh, Madhya Pradesh, Punjab, Tamil Nadu, Orissa and West Bengal. In the opinion of the Committee, a uniform policy should be implemented as far as Water Royalty is concerned. Accordingly, the Committee recommend that there should be no royalty on water utilised by the small hydro projects.

3.38 The Committee observe that the States having a good power purchase policy attract a lot of private investors in the small hydel sector. But so far only 13 States have declared their policy for private sectors participation in this field. Out of 13 only 4 States viz. West Bengal, Tamil Nadu, Kerala and Himachal Pradesh, where the participation of the private sectors is satisfactory have allowed the sale of power to the third party. The Committee, therefore, recommend that third party sale should also be allowed of power generated through small hydro projects.

3.39 The Committee note that the time period required for execution of a small hydro project varies from 2 years for the canal based SHPs to 3 to 4 years on the other sites having only 5-6 months working period. The Committee are also aware of the difficulties faced by various developers in various regions of the country. The Committee expect a time bound clearances/completion of the small hydro projects by the concerned Government authorities/developers respectively. The Committee feel that different clearances to the developers should be given in a time-bound manner. And the developer should also complete his project in a fixed period which can perhaps be taken from the first pour of concrete.

3.40 The Committee observe that most of the projects, have been inordinately delayed in the absence of well framed and accepted PPA. Despite repeated requests,

the situation has not improved. The Committee note that though the Ministry of Non-Conventional Energy Sources (MNES) have prepared a model PPA, it has not been accepted by the States. The Committee recommend that a model PPA drawing experiences from various States ensuring the entrepreneurship of a developer, a reasonable return on investment, a reasonable pay-back period and a reasonable payment terms should be prepared and circulated to all the States for its compliance. There should also be an in-built provision for reviewing the PPA after a fixed period of say 3 years.

3.41 Keeping in view the overall viability of the small hydro project, the Committee feel a minimum lease period of 30 years should be provided. It would be all the more attractive for the enterpreneurs if it is provided that the lease agreement would be eligible for renewable for another 30 years based on the past performance of the contractual obligations of the enterpreneure.

3.42 The Committee note that with the transfer of hydel projects between 3-25 MW capacity from the Ministry of Power to the Ministry of Non-Conventional Energy Sources (MNES), the estimated potential has risen from 10,000 MW to 15,000 MW. Similarly, the total installed capacity has grown from 63 MW in 1989, when the projects upto 3 MW was transferred from the Ministry of Power to MNES, to 1320 MW in 2000. Considering the enhanced mandate, the Committee feel that an apex organization having adequate facilities for testing of equipments, assessment of resources, verifying the veracity of the collected data, providing consultancy services to the developers and an exclusive laboratory dedicated to the research and test facilities related to the small hydro power is required for the optimum development of small hydel sector in the country. The Committee recommend that an organization like NTPC and NHPC etc. should also be set up for SHPs.

3.43 The Committee observe that Energy Management Centre has done a commendable work for the promotion and development of SHP in the State of Kerala. The Committee are happy to learn that the Ministry have also been

promoting similar agencies in other States also. The Committee would like to know what financial and other incentives have been offered or are proposed by the Government to these agencies.

3.44 The Committee are happy to learn that Ministry of Non-Conventional Energy Sources (MNES) have been encouraging the State Agencies to involve local people in the process of operation and maintenance of the completed SHP projects. This has been done in the State of Uttar Pradesh only. The Committee suggest that as far as possible local people should be involved from the beginning of the project. They should be adequately trained for operation and maintenance of the project. The Committee feel that other States should also be encouraged to follow the example of Uttar Pradesh.

3.45 The Committee find that the growth of SHP has been hampered due to lack of facilities for evacuation of power. Inadequate financial resources are the single most reason, for under-development of evacuation facilities. The Committee further note that besides Transmission Line other infrastructure works such as construction of road, bridges etc too are also not taken up by the State Authorities. The Committee are of the view that absence of evacuation facilities and other infrastructure work may act as disincentive for an entrepreneur, to undertake the development of Small Hydel Project. The Committee, therefore, recommend that State Governments should avail resources at concessional rates from Accelerated Power Development Programme(APDP) which has been promoted specifically for these matters. The Committee desire that MNES should take up the matter with the concerned States/SEBs and PFC/IREDA and assist in formulating bankable proposals. The Committee also recommend that MNES should consider the cost incurred on infrastructure works as a component of a project's cost and devise a scheme to evacuate power generated from SHPs. The Committee feel that the Government should encourage the use of power generated through SHPs in the surrounding areas itself thereby minimizing the need for transmission lines.

3.46 The Committee find that Small Hydel Projects are required to obtain clearances from Environmental and Forest angles. However, projects costing less than Rs. 50 crore are exempted from Forest clearance, which approximately cover projects up to 10-12 MW. The Committee note that MNES had taken up the matter of exempting Forest clearances for SHP from MoEF, but of no avail.

3.47 The Committee are surprised to note that SHP projects are subjected to clearances from Pollution Control Board also. The argument of MoEF that since HE projects disturb the inter-relationship which exist among water, air and land & human being, they are required to obtain clearances from State Pollution Control Board does not sound convincing. As the Ministry of Environment and Forests / State Pollution Control Boards have rarely come out with any such studies in different regions of the country and which they expect the developers of SHPs to protect. The Committee, therefore, recommend that Government should not insist for clearances from Pollution Control Boards. Accordingly, the relevant statute/law should be amended to give effect to the recommendation of the Committee.

3.48 In the opinion of the Committee, since neither much land is required for setting up of SHP and nor is there any major displacement of human population, the present ceiling of Rs. 50 crore as project cost should be suitably enhanced based on their experience of present ceiling.

3.49 The Committee note that neither 'industry Status' nor 'priority sector' lending norms, have been made applicable for SHP sector. The Committee have observed that SHP sector is still in the process of near commercialization and more than ninety per cent of the potential, yet to be tapped, there is every justification of conferring the status of industry and extending priority sector lending norms to SHP sector. The Committee, therefore, desire that Government should extend these to SHP projects at the earliest.

CHAPTER - IV

Private Sector's Participation in the field of Small Hydel Sector

Keeping in view the overall policy of Government of India to encourage private sector participation in the field of power generation, Ministry of Non-Conventional Energy Sources issued guidelines to the States in September, 1993 for announcement of suitable policies for private sector participation in the field of commercial small hydro power projects. The States were also requested to identify potential sites and offer them to the private sector for speedy development of small hydro power projects. They were also requested to develop a suitable institutional mechanism and develop streamlined procedures for speedy clearance of the projects. 13 States namely Uttar Pradesh, Madhya Pradesh, Punjab, Himachal Pradesh, Andhra Pradesh, West Bengal, Kerala, Tamil Nadu, Haryana, Orissa, Maharashtra, Karnataka and Rajasthan have announced policies for private sector participation. The policies introduced in State Government to attract private sector participation is given as Annexure – II.

4.1 State Governments have also identified sites and offered to entrepreneurs. The State-wise number of sites and aggregate capacity offered/allotted to private sector for setting up of commercial SHP projects are as follows:-

S.No.	Name of State	Number of Sites	Capacity (MW)
1.	Himachal Pradesh	409	612.95
2.	Uttar Pradesh	34	189.10
3.	Punjab	50	42.18
4.	Madhya Pradesh	42	125.37
5.	Maharashtra	10	52.30
6.	Andhra Pradesh	40	91.25
7.	Karnataka	99	548.44
8.	Kerala	34	119.99
9.	West Bengal	2	5.40
10.	Orissa	15	104.80
11.	Tamil Nadu	2	7.90
12.	Haryana	9	7.00
	Total	**746**	**1906.68**

4.2 In regard to achievement of private sector participation, the Committee was informed that while projects aggregating to 20.65 MW in the State of Karnakata and projects aggregating to 27.3 MW in the State of Andhra Pradesh have been commissioned by the private sector. In other States, detailed feasibility studies, signing of PPAs, and financial tie-ups are in progress by various developers.

4.3 The responsibility of monitoring the progress of works of the private sector is of the State agencies who have allotted the sites to the private sector. The Ministry of Non-Conventional Energy Sources continuously review and monitor the progress of private

sector through review meetings with the concerned agencies, periodic sites visits and through Regional Offices of the Ministry.

4.4 Ministry issued guidelines to the States in September, 1993 for announcement of suitable policies for private sector participation in the field of small hydro power. Even after the lapse of almost 7 years, only 13 States have announced policies for private sector participation and offered capacity aggregating about 1900 MW to the private sector. When enquired about the bottlenecks identified in the implementation of small hydro projects by the private developers, they replied as under:-

> "The major bottlenecks identified in implementation of SHP projects by the private sector are the time delay in statutory clearances by the State Governments and signing of PPAs. In some States even the polices are changed mid-way, which results in difficulty in implementation of SHP projects by the developers. The Ministry regularly interact with the State Governments to pursue them for improving the policies for private sector participation in the renewable energy sector. Regular meetings are organized with the Chief Executives of State Agencies, Power Departments etc. to review the status".

4.5 The capital subsidy is available under State sector and not admissible for privately developed projects. When asked whether Government propose to extend such subsidy for private sector also, the MNES in a note informed as under:-

> "At this stage, the Ministry do not propose to extend capital subsidy for SHP projects developed by the private sector. The Ministry is aiming towards commercialization of SHP sector and shift from capital subsidy to interest subsidy. It is expected that with the suitable policies of the State Governments regarding buyback of power, wheeling, banking, etc., the commercial projects would be viable on their own and would not require capital subsidy".

Policy of IREDA for Private Sectors Participation

4.6 As far as private sectors participation in the small hydel sector is concerned, there are different schemes available with IREDA. IREDA provides loan for SHP projects undertaken by the private sector and public sector enterprises. The interest rate for project upto 1 MW is 13.50%, for 1-3 MW capacity projects is 13.75% and for 3-25 MW capacity projects is 14%. The loan is provided upto 80% of the total project's cost for project upto 1 MW and 75% of the total project cost for other capacity. The repayment period is of 10 years with moratorium of 3 years".

4.7 On the question of reviewing its fiscal policy to improve the private sector participation in the small hydro power project, the MNES replied as under:-

> "IREDA reviews its financing norms on a year to year basis after taking inputs from the Credit Policy announced by RBI; the financial norms of All India Financial Institutions; cost of funds; conditionalities imposed by the international

lenders/donors; suggestions received from various Associations; borrowers, MNES etc.

4.8 When asked whether IREDA propose to provide loan to the private developers for working capital, the MNES mentioned in their reply as under:-

> "IREDA does not provide working capital to the private developers. However, while appraising a project, the quantum of margin money required by the promoters for availing working capital from commercial banks is assessed and made part of the cost of the project. The margin money for working capital is thus shared with the project promoter while sanctioning the project. Generally, Small Hydro projects do not have the requirement for working capital. Since working capital is a short term loan and requires day to day monitoring, it is normally provided by Commercial Banks".

4.9 The loan percentage by IREDA for SHPs has been reduced. The details is as under:-

IREDA's Financing Norms for SHP projects during FY 2000-2001

S.No.	Capacity	IREDA's loan Component	Minimum Promoters Contribution
(i)	Upto 1 MW	Upto 80% of the total project cost	20%
(ii)	Above 1 MW and upto 3 MW capacity	Upto 75% of the total project cost	25%
(iii)	Above 3 MW and upto 25 MW capacity	Upto 75% of the total project cost	25%

IREDA's Financing Norms for SHP projects during FY 2001-2002

S.No.	Capacity	IREDA's loan Component	Minimum Promoters Contribution
(i)	Upto 1 MW	Upto 75% of the total project cost	25%
(ii)	Above 1 MW and upto 5 MW capacity	Upto 70% of the total project cost	30%
(iii)	Above 5 MW and upto 15 MW capacity	Upto 70% of the total project cost	30%
(iv)	Above 15 MW and upto 25 MW capacity	Upto 70% of the total project cost	30%

4.10 **The following are the reasons for lowering IREDA's loan component:**

a) Lesser the loan component higher the viability of the project.
b) Resources available with IREDA can be utilised to support more projects and thus adding more capacity.
c) The reduced tariff regime adopted by some states like HP, Uttaranchal, MP (when compared to MNES guidelines tariff) may be able to service the lower debt portion than higher debt portion.

4.11 The minimum promoters' contribution ranges between 25-30% in case of financing schemes implemented by IREDA. It has been observed that there are certain schemes in Solar sector where promoters' contribution is 15% only. When asked about the justification of providing benchmark of 25-30% as promoters' contribution for SHPs., MNES in a note stated:-

> "The normal debt:equity ratio followed for project financing in India is 60:40. However, IREDA being specialized agency established for promoting and developing renewable energy projects has relaxed the above to attract investments.
>
> The criteria for fixing promoter contribution is dependant on the following :
>
> a) Viability of the project depending on the generation potential, project cost and the purchase price available.
>
> b) The debt servicing capacity of the particular project which is again dependant on the viability and the limit to which the project can sustain debt burden.
>
> c) Market development of Solar Photovoltaics sector is very difficult on account of very high capital costs. In order to make special promotional efforts in this sector, IREDA has been offering finances at relatively lower promoter contribution. Solar Photovoltaics financing forms a very minor share in IREDA's loan portfolio.
>
> d) Depending upon the present scenario with respect to the policy/purchase price announced by the State Govts.
>
> e) The small hydro projects require serious investors who can implement the project as it consists of various clearances etc. to infuse seriousness, promoter contribution is required.
>
> f) IREDA has no proposal to reduce the present promoter contribution to 10-12 % due to the reasons cited above".

4.12 It has been brought to the notice of the Committee that IREDA take unduly long period in clearance of projects on one ground or the other. At times an entrepreneur has to visit the office of IREDA innumerable times for getting the projects cleared. On being

asked about the steps proposed to be taken by IREDA to facilitate speedier clearances, the MNES replied:-

> "(a) For facilitating speedier clearance, IREDA follows a stream lined procedure for registering and appraising the project
>
> (i) IREDA registers eligible applicants as per the Guidelines notified. If the applicant complies with all the essential requirements, the application is registered in IREDA for detailed appraisal of the project. If the applicant submits all the essential requirement IREDA takes about 3 days to register the application.
>
> (ii) Upon registration of the application registration number is given to the applicant with a request to send the balance requirements, if any, for taking up detailed appraisal.
>
> (iii) Normally IREDA takes about 90 days for appraisal.
>
> (iv) At the end of the appraisal process, the applicant is informed about the status of his application either through sanction letter or through regret letter, as the case may be.

Some of the reasons for delay in sanction of the loan are (a) Delay in providing the necessary security confirmation and other details by the applicant; (b) confirmation on hydrological data from relevant Government Departments; and (c) verification of Detailed Project Report parameters through independent external agency wherever required.

For facilitation of speedier clearance the following documents/brochures have been published and circulated:

(i) Financing Guidelines.
(ii) Small Hydro Brochure
(iii) Loan application form explaining all the requirements.
(iv) Best Practices Manual on Small Hydro (issued free of cost).
(v) Legal Requirements at a Glance.
(vi) World Bank Guidelines on Procurement. .
(vii) Conducting regular meetings with borrowers and other stake holders like consultants, suppliers, Nominee Directors, Concurrent Engineers, BDAs, etc.

> Apart from the above, review by senior officers is conducted on regular basis and status reported at every board meeting".

4.13 As regards the monitoring and evaluation of the performance of SHPs entrusted to private developers, MNES replied:-

"IREDA monitors and evaluates performance of small hydro projects through appointment of concurrent engineers, site visits to review physical and financial progress by IREDA's own staff, through nominee directors of IREDA appointed on the boards of borrowers of IREDA. IREDA also has a separate Planning, Monitoring and Evaluation Division for undertaking special inspection and review of projects. IREDA requires borrowers to go in for competitive bidding process to avail better prices through competition for the various procurements relating to small hydro projects as per World Bank procedures. IREDA constantly monitors and reviews the projects to prevent time over run and cost over run. IREDA has already developed bench marking costs for canal based Small Hydro projects through Alternate Hydro Energy Centre, Roorkee University".

4.14 When asked as to whether IREDA propose to draw a shelf of projects with all statutory clearance so as to facilitate the promoter to develop hydel project expeditiously, the MNES replied as under:-

"This is beyond the scope of IREDA. However, as the State Governments are responsible for allocation of projects and arrange for statutory clearances, the proposal for drawing up a shelf of projects can be undertaken by respective State Governments to facilitate the developers to expedite the project implementation".

4.15 On the question of mobilising resources form NRIs for the development of Small Hydel Power Project , the MNES replied:-

"Through business promotional efforts, electronic and print media, website and international networking organizations, IREDA solicits proposal for investment from NRIs and others in Small Hydro projects".

4.16 The Committee note that even after issuing guidelines to the States in 1993 for announcement of suitable policy for private sector's participation in the field of small hydel sector, only 13 States have so far declared their policies, offering capacity aggregating to 1906.68 MW to the private developers. The Committee further note with concern that out of this capacity of 1906.68 MW, only 47.95 MW could be commissioned in the States of Andhra Pradesh and Karnataka. The remaining 11 States viz. Uttar Pradesh, Madhya Pradesh, Punjab, Himachal Pradesh, West Bengal, Kerala, Tamil Nadu, Haryana, Orissa, Maharashtra and Rajasthan have not yet commissioned any SHP project in the private sector. In this Context, the Committee would like to know the measures that are being taken by Ministry of Non-Conventional Energy (MNES) to encourage private sectors

participation in these States. The Committee also find that though the North-Eastern States have the total capacity of 1845.72 MW, none of the States in NE have declared their policies as yet in this regard. The Committee, therefore, recommend that the Government should adopt two-pronged strategy. On one hand, all the States/UTs having small hydro potential should be encouraged to declare their policies in accordance with the guidelines laid down by MNES. On the other hand, they should take effective measures to ensure that all the SHP projects offered to the private developers in 13 States, which have declared their policies for private sector's participation in the field of small hydel sector' are taken up for implementation at the earliest.

4.17 The Committee would like to emphasise that remaining State Governments should be pursued to declare their long term policy statements for private sector participation in SHP. The Committee also desire that in the interest of the development of SHP sector and for the benefit of the State mid-way policy changes should not be permitted. The Committee hope and trust that MNES would take measures to ensure that mid-term policy changes are not resorted to by the States/UTs.

CHAPTER - V

Renovation and Modernisation (R&M) of old SHPs

The MNES has a scheme for providing financial assistance for Renovation and Modernisation (R&M) and capacity up-rating of small hydro power stations. Under this scheme, financial assistance is provided up to 75% of the R&M cost or Rs.2 crore per MW, whichever is lower, to the utilities in government and public sectors. The R&M scheme has been extended to cover SHP projects up to 15 MW capacity each with a maximum support of Rs.10 crore per project. The main aim of the scheme is to extend the life of these stations with improved performance and reliability. The Ministry has so far received proposals from the Government of Sikkim, West Bengal, Himachal Pradesh, Assam, Tripura, Nagaland, Jammu & Kashmir and Uttar Pradesh. The Ministry have approved the grant for renovation of Jali (6x350 KW) and Rongnichu II (5x500 KW) projects in Sikkim, Rinchington (2x1000 KW) and little Rangit (2x1000 KW) projects in West Bengal and Nogli (2x250+4x500 KW) and Chaba (3x250+2x500 KW) projects in Himachal Pradesh. The renovation work in these projects has already started and is likely to be completed by the next year. Visits by joint team were made during the year to 10

SHP projects in Tripura and Uttar Pradesh to assess their R&M requirements. These projects are under consideration for support under R&M scheme.

5.2 Selection of units and clearly defining the scope of works is the first step towards Renovation and Modernisation of the plant. Normally a plant is designed to have a particular life. When asked about the criteria of selecting a project for R&M, the MNES stated:-

> "The criteria for selecting a project to provide capital grant under the MNES R&M scheme is that the station capacity of the SHP project should be up to 15 MW and the project should have been commissioned up to the beginning of the 8th Five Year Plan i.e. 1st April, 1992. The past performance of the station, factors which have led to the sub-optimal/ non-functioning of the plant and the institutional arrangement to ensure non-reoccurrence of these factors are also the guiding factors in selection of the project".

5.3 Explaining about the planning and execution process done after a unit is selected for R&M, the MNES stated:-

> "A joint inspection is carried out of the project selected for R&M works by a team of MNES officers, an expert in the field of SHP and the concerned State Agency. Following this, detailed engineering is done by the implementing agency (SEB/ State Agency) and tenders are invited. Once the work is identified and orders are placed, the execution is done by the concerned SEB/ State Agency to complete the work in a stipulated time frame. MNES monitors the over all progress of the work".

5.4 As regards the reasons for lack of response from private sectors in the field of R&M, the MNES stated:-

> "Since, State Governments/ SEBs/ State Hydro Power Corporations are the owners of old SHP projects and they also have necessary technical manpower, old SHP projects have not been offered to the private sector for their renovation and modernization".

5.5 When asked whether the Ministry of Non-Conventional Energy Sources have decided to make any amendment in the existing policy for private sector participation in R&M activities of SHPs so that their participation and investment in this field may increase, the MNES replied as under:-

> "The Ministry has so far not decided to make any amendment in the existing policy for giving capital grant towards private sector participation in the R&M activity of SHP projects. Since, State Governments/SEBs are the owners of old SHP projects, it is up to them to decide if they want to involve private sector in the R&M activity. The major difficulty in this is about the present worth of the

project and at what rate the power should be purchased from the private sector if a project is given to the private sector for R&M and further operation."

5.6 As regard to the different alternatives considered for augmenting funds for undertaking R&M activities in SHPs, the MNES informed:-

"The Ministry of Power has announced the Accelerated Power Development Programme (APDP) under which funds to a tune of Rs. 1000 crore are available to the State Governments for various activities in the Power Sector. R&M activity is one such activity covered under the APDP programme. This would help in augmenting funds for undertaking R&M activities for SHP projects also".

5.7 Asked whether State are including specific provision for R&M on SHPs in State plan, so that matching funds could be made available, the Ministry in a note stated:-

"The States/SEB do make specific provisions for the R&M works of SHP projects, whenever it is decided to consider a project for its renovation and modernization by the State Governments, keeping in view its overall economic viability. These funds act as matching funds to the capital grant given by the MNES for the R&M works. It may be mentioned that MNES provide grant for R&M works up to a maximum of 75% of the R&M cost or up to Rs.10 crore per project, which ever is less and the balance cost is to be met by the concerned State Agency/SEB as matching fund".

5.9 The Committee would like to emphasise that concessional financial assistance is available under Accelerated Power Development Programme(APDP) for undertaking R&M activities. The Committee desire that MNES should take up the matter of financing R&M of SHPs through this scheme with Ministry of Power/PFC. Accordingly, State Governments/SEBs be persuaded to formulate bankable specific proposals. To further encourage R&M works matching funds can be made available by MNES for the projects.

5.9 The Committee note that there is no system of reviewing the performance of SHPs to assess their needs for R&M works. There are no set guidelines for undertaking such a review. The Committee recommend that a comprehensive Survey should be carried to identify the old SHP projects which have outlived their designed life and require R&M. The Committee find that MNES is providing capital grant of upto Rs. 2 crore per MW for R&M activities of old SHPs to State Governments/SEBs. The grant is upto a maximum of 75% R&M cost or upto Rs.10 crore per project whichever is less. Moreover, the grant is available for

projects upto 15 MW. The Committee are of the view that funding mechanism should be reviewed to see whether the capital grants available under R&M schemes can be raised upwardly. The Committee also recommend that such grants should also be extended to the projects of capacity between 15-25 MW.

5.10 The Committee have noted that small hydel sector is not open for the private sector's participation in the field of Renovation and Modernisation (R&M) of old SHPs. Before November, 1999 the old small hydel projects between 3-25 MW which were under the jurisdiction of Ministry of Power were open for R&M through private developers but now they have been barred. In the changed scenario, when the Government have been depending heavily on the private sector for the installation of new small hydel projects, it seems quite illogical to prohibit them to enter into the field of R&M of old small hydel plants upto 25 MW. The Committee, therefore, recommend the Government to open the door for the private sectors participation in the field of Renovation and Modernisation (R&M) of old SHP plants.

CHAPTER - VI

SHP Programme in North-Eastern States

All the seven North-Eastern States have a large potential of Small Hydro Power. Over 400 sites with aggregating capacity of 270 MW have already been identified in the region. MNES is making concerted efforts to develop SHP in North-East Region. A team of official visited the North-Eastern States with a view to reviewing the present status of SHP programme and to get new proposals generated to tap the SHP potential in the region. The Ministry have so far supported 24 projects with an aggregate capacity of 52.6 MW. In addition, the Ministry have supported 74 sites in the region for conducting feasibility studies. It is proposed to take up 50 MW projects during the 9th Plan-period in the North-Eastern Region.

6.2 Ministry of Non-conventional Energy Sources provide capital subsidy for setting up of small hydro power projects upto 15 MW station capacity in the State sector. The capital subsidy is provided to State Governments, State Electricity Boards and State

Government Agencies. The following capital subsidies are admissible for the State sector projects in different areas:-

Schemes	Areas	Upto 1 MW	Above 1MW & upto 5 MW	Above 5MW & upto15 MW
Capital Subsidy for State sector projects	N E Region & Sikkim	Equipment Cost + 50% Of Civil Cost upto Rs. 60,000 per KW	Equipment Cost + 25% of Civil Cost upto Rs. 4.5 crore per MW	Equipment Cost + 25% of Civil Cost limited to Rs. 22.50 crore/ project
	Middle Himalayas, Ladakh, A&N	Equipment Cost + 50% Of Civil Cost upto Rs. 45,000 per KW	Equipment Cost + 25% of Civil Cost upto Rs. 3.00 crore per MW	Equipment Cost + 25% of Civil Cost limited to Rs. 15 crore/ project
	Other Areas (*only notified hilly regions*)	Equipment Cost + 50% Of Civil Cost upto Rs. 30,000 per KW	Equipment Cost + 25% of Civil Cost upto Rs. 1.50 crore per MW	Equipment Cost + 25% of Civil Cost limited to Rs. 7.5 crore/ project

6.3 The Ministry have developed a special incentive package for the promotion of SHP programme in the North-Eastern States and Sikkim. A capital grant of upto Rs.7.5 crore per MW is available for SHP projects in the region. The capital support is to cover 90% of the project cost for projects upto 1 MW capacity each, 75% of the project for projects in the range of 1-5 MW and equipment cost plus 25% of civil cost for projects in the capacity range of 5 MW-15 MW. The maximum support per project is limited to Rs.22.5 crore.

6.4 A higher level of capital subsidy is being provided for SHP projects in NE Region and Sikkim with a view to encourage the North-Eastern States to set-up more SHP projects because despite having a very good potential of setting up SHP projects not many projects are coming up in these States. The higher level of capital subsidy for Middle Himalayas, Ladakh and A&N Islands with respect to other hilly areas is mainly on account of the fact that the sites in these regions are inaccessible and remotely located incomparison to other hilly areas. The approach to these sites are very difficult and hence the project costs in these regions are normally higher.

6.5 The Ministry is providing interest subsidy through financial institutions with an objective of reducing the rate of interest on the term loan provided to the developers for setting up commercial SHP projects upto 25 MW station capacity. The following interest subsidies are admissible for the commercial SHP projects:

HILLY AREAS NORTH-EAST STATES, SIKKIM AND A&N ISLANDS

Items	Capacity of SHP projects

	Upto 1 MW	Above1 MW & upto 5 MW	Above 5 MW & upto 15 MW	Above 15 MW & upto 25 MW
Interest Subsidy	7.5 %	5 %	3 %	2 %
Eligible Capital Cost Ceiling	Rs. 6.00 crore per MW	Rs. 6.00 crore per MW	Rs. 5.00 crore per MW	Rs. 5.00 crore per MW
Maximum Support Ceiling (capitalised amount) per project	Rs. 1.25 crore	Rs. 4.00 crore	Rs. 6.00 crore	Rs. 7.00 crore

OTHER AREAS

Items	Capacity of SHP projects			
	Upto 1 MW	Above1 MW & upto 5 MW	Above 5 MW & upto 15 MW	Above 15 MW & upto 25 MW
Interest Subsidy	5 %	2.5 %	2 %	1.5 %
Eligible Capital Cost Ceiling	Rs. 5.00 crore per MW	Rs. 4.00 crore per MW	Rs. 4.00 crore per MW	Rs. 4.00 crore per MW
Maximum Support Ceiling (capitalised amount) per project	Rs. 0.75 crore	Rs. 1.50 crore	Rs. 3.50 crore	Rs. 4.00 crore

6.6 Among the reasons for giving higher interest subsidy for the commercial SHP projects in hilly areas, NE States, Sikkim and A&N Islands includes remoteness of site, difficulty in constructing the projects, higher risks to the projects and the quantum of energy generation. The higher level of interest subsidy is being kept to attract more entrepreneurs to set up SHP projects in remote areas also.

6.7 When asked about the rationale of having different subsidy (interest as well as capital) schemes for the SHP projects situated in equally difficult topography the same geophysical characteristics but situated outside the N-E Region in hilly areas of States of Uttar Pradesh, Himachal Pradesh and Tamil Nadu, Andhra Pradesh and Kerala, the MNES in their reply stated as under:-

> "The Ministry is providing higher level of capital subsidy to the projects in middle Himalayas, Ladhakh and A&N Islands in comparison to other area projects. However, this capital subsidy is lower than for projects in N.E. Region and Sikkim. The higher level of capital subsidy for N.E. Region is also on account of special category Status decided by the Planning Commission and the fact that 10% of the Plan outlay of the Ministry has to be spent in the North-East. At this stage, the Ministry is not considering any change in the pattern of capital

subsidy. The interest subsidy is uniform both for hilly area projects and for projects in N.E. States".

6.8 When asked whether MNES propose to earmark non-lapsable fund for the development of small hydro power projects, the MNES replied:-

> "The Ministry has already earmarked 10% of its budget to be spent in the North Eastern States as directed by the Planning Commission. SHP projects in N.E. States are being funded utilizing this component of the Ministry's budget. The allocation of Non-lapsable fund in Planning Commission is done by the Planning Commission. If it becomes necessary, the States can approach the Planning Commission for allocation of funds from the non-lapsable pool meant for the North-East".

6.9 The North-Eastern Region has a very good potential of SHP development. MNES is giving special incentives to the North-Eastern States for development of such projects. It is also known that the Eastern as well as North-Eastern Region has surplus power due to lack of evacuation facilities. When the Committee desired to know about the response of private developers developing SHPs in the North-Eastern Region, they replied as under:-

> "None of the North-Eastern States have so far announced policies to invite private sector to set up SHP projects. Hence, at present there are no private sector projects coming up in the N.E. States. The Ministry has been continuously following up the matter with these States to announce the policy. A separate meeting was called by Secretary, MNES in Calcutta last year where this issue of private sector policy was discussed at length and the North-East States were guided to announce a policy in this regard".

6.10 The Committee have been informed that the MNES is persuading NHPC, NTPC and NEEPCO to take up SHP projects. As a result of which NHPC has started execution of 2 SHP projects namely Kambang (6 MW) and Sippi (4 MW) in Arunachal Pradesh and the Ministry is providing capital subsidy for these projects.

Special Schemes by IREDA for North-Eastern States

6.11 IREDA provides following concessions to the entrepreneurs setting up SHP projects in North-Eastern States:-

a) Rebate of 1.00% p.a. in the interest rate for grid connected SHP projects and rebate of 2% for non-grid connected projects.
b) Exemption from the payment of :

- Registration Fee
- Inspection Charges
- Legal Charges (Other than incurred for Recovery)
- Expenditure incurred on Nominee Director(s)

- Front – end fee @ 1% of Loan amount

c) Concession of 5% p.a. in Promoter's contribution

6.12 When asked what efforts IREDA has made for development of potential of Small Hydro sector in North Eastern Region. The Committee was informed that the following efforts were made for this purpose :-

i. Organizing of Business Meets, Seminars, Workshops
ii. Empanelment of Business Development Associates
iii. Interaction with Technical Consultancy Organizations/SNAs
iv. Extend concessions/incentives
v. Promotional advertisement through print media/electronic media.
vi. Efforts through Public Sector organizations like NEDFI, NHPC, NEEPCO
vii. Constitution of IREDA/BDA/SNA Consultative Committee for North Eastern States

6.13 The Committee note that IREDA provides certain exemptions from the payment of registration fee, inspection charges, front-end fee @ 1% of loan amount etc, and 5% p.a. concession in Promoters contribution to the entrepreneurs setting up SHP projects in North-Eastern States. Despite these incentives, it has not been able to develop SHP projects in the North-Eastern sector. The Committee feel that the major constraints faced in this regard are absence of nodal agencies, policy for private sectors participation policy framework for Grid connected projects etc. The Committee recommend that the Government should remove the above-mentioned constraints so that the abandoned SHP potential available in the North-Eastern States could be harnessed for the benefit of the people of the States.

6.14 The Committee are not convinced with the rationality of not extending concessional capital subsidy/interest subsidy to SHP located in areas of Uttranchal and hills of Southern India, on the lines of North-Eastern States . The Committee are of the firm opinion that areas of Uttranchal and hill tracts of Southern India are located in equally inaccessible, remote and difficult topography. The Committee, therefore, recommend that Government should review their decision and extend capital subsidy/interest subsidy to these areas on the lines of North-Eastern States.

6.15 The Committee find that inspite of Government special dispensation for North-Eastern States, the performance under SHP sector is not encouraging. For

instance a liberal capital subsidy for State sector projects and interest subsidy for commercial projects and 10% budget of MNES for North-Eastern Region by MNES and concessional loan by IREDA, have failed to enthuse the State sector and private entrepreneur to take up the development of SHP. It is further shocking to note that none of the State of North-Eastern Region, has announced policy for private sector participation. The Committee, have noted that North-Eastern States are admissible to receive 90% grants and 10% loans components for development projects. The Committee desire that Government should vigorously undertake development of SHP through 90% grant component. 10% of loan component be provided by MNES, so as to accelerate the promotion of SHPs in North-Eastern States on a large scale. At the same time, the Committee desire that State sector hydel PSUs/Corporations and Central sector hydel PSUs such as NEEPCO , NHPC be urged to take up cluster of SHPs on a large scale. In order to enthuse hydel PSUs/Corporations to undertake development of SHPs, some incentives/concessions should be extended to them.

CHAPTER - VII

Financing of Small Hydel Projects

IREDA, PFC, REC and other FIs such IDBI, ICICI and commercial banks finance small hydel projects. M/s Indian Renewable Energy Development Agency Ltd. (IREDA) is a Financial Institution (FI) established in March, 1987 as a public sector enterprise under the administrative control of Ministry of Non-Conventional Energy Sources for the promotion, development and financing of New and Renewable Sources of Energy (NRSE) technologies including the small hydel sector upto 25 MW.

7.1 IREDA has formulated its own small hydro development programme which supplements the MNES programme in a national effort in harnessing the SHP potential effectively and speedily. IREDA has so far sanctioned 82 small hydro projects aggregating to installed capacity of 262.78 MW, with an outlay of Rs.10216.239 million. The term loan sanctioned by IREDA to these projects is aggregating to Rs.659.784 crore.

Various schemes of Indian Renewable Energy Development Agency (IREDA) to encourage development of small hydro project in the country are:

(a) Project financing schemes for grid connected projects upto 25 MW
(b) Equipment financing schemes for micro hydel sets upto 100 KW capacity

(c) Manufacturing loans for micro hydel sets

7.2 **Salient features of the schemes offered is as under:**

Project Financing: Grid connected hydro electric schemes in existing irrigation canals, dams, R-o-R schemes with maximum station capacity up to 25 MW. States where grid stability requirements are met and where adequate policies on private power generation is in place.

Eligible Loan Amount (Maximum)		**100% of eligible equipment cost & 90% of civil cost limited to: 75/80% of project cost**		
		Up to 1 MW	1 to 3 MW	Above 3 MW
Promoters contribution		20%	25%	25%
Interest rate (Excl. Int. tax)	International funds	14.50%	15.00%	15.50%
	IREDA funds	15.00%	15.50%	16.00%
Repayment (Years including Moratorium)		10	10	10
Maximum Moratorium (Years)		3	3	3
Procurement Procedure		World Bank Line of Credit: LIB/RFQ up to US$ 5 Million ICB above US$ 5 Million IREDA loan: Established commercial practice		

Micro Hydel Sets: Grid/Non-Grid connected Micro Hydel sets upto 100 KW capacity

	Equipment Financing Scheme	Manufacturing Loan
Loan Amount	90% of equipment cost	75% of project cost
Promoters contribution	10%	25%
Interest Rate (Excl. of Interest Tax)	14.0%	15.0%
Repayment (Incl. Moratorium)	7 Years	7 years
Moratorium (Maximum)	2 Years	2 Years
Procurement	Single quotation	ECP

7.3 **Concessions/Rebates and Special Provisions**

a) Rate of interest would be reduced by 1.0% in the event of borrower furnishing security of Bank Guarantee.
b) Rate of interest shall be reduced by 0.5 in the event of project being sanctioned out of international funds.
c) Rebate of 0.50% in interest rate will be given for timely payment of interest and repayment of loan installment.
d) Benefit of interest subsidy from MNES wherever available/applicable, will be passed on to the borrower.

e) Reduced margin money upto to 20% shall be allowed for AAA (or equivalent) rated companies, PSUs and cooperative sector for project financing schemes.

f) Special concession for entrepreneurs belonging to SC/ST and women categories:-

- No initial processing fee
- No inspection fee
- No legal charges
- Non-expenditure on nominee directors
- No front end fee
- 5% concession in promoters contribution
- Rebate of 0.5% interest rate (up to project cost Rs.10.00 lakh)

g) Special concessions for entrepreneurs for setting up projects in North-Eastern States, hilly areas, islands including estuaries and desert areas:-

- No initial processing fee
- No inspection fee
- No legal charges
- Non-expenditure on nominee directors
- No front end fee
- 5% concession in promoters contribution
- Rebate of 2.0% interest rate

h) Grid connected power projects financed under projects financing category if completed a head of schedule as originally agreed/stipulated in the loan sanction letter without any cost overrun will be sanctioned one time performance reward equivalent to 0.25% of total loan disbursed. Date of commissioning as notified by State Electricity Board will be taken as date of completion.

7.4 The achievements of in regard to targets for capacity sanction / loan and disbursement during 8th and 9th plans. During 8th and 9th plan are given below:

Targets and Achievements in regard to SHP Projects Sanctioned (Gross) by IREDA during 8th Plan on Annual Plan Basis

	1992-93	**1993-94**	**1994-95**	**1995-96**	**1996-97**
Capacity Sanction (MW)					
Target	13.6	15.0	36.00	40.00	45.00
Achievement	13	15.2	37.98	64.6	50.80
Loan Sanction (Rs./Crores)					
Target	*	27.30	65.25	75.00	80.00
Achievement	5.40	49.94	53.12	118.78	122.93
Disbursement (Rs./Crores)					

Target	4.5	26.96	63.08	70.00	54.00
Achievement	8.25	5.24	6.06	10.06	31.57

* No sanction target was fixed.

7.5 **Targets and Achievements in regard to SHP Projects Sanctioned (Gross) by IREDA during 9th Plan on Annual Plan Basis**

	1997-98	1998-99	1999-2000	2000-01	2001-02 (Upto July 2001)
Capacity Sanction (MW)					
Target	60.0	60.0	60.00	49	55
Achievement	60.5	38.80	40.6	49	2.4
Loan Sanction (Rs./Crores)					
Target	105.00	75.00	120.00	147	187
Achievement	176.05	116.01	143.50	182.92	6.63
Disbursement (Rs./Crores)					
Target	90.00	78.00	80.08	73	91
Achievement	65.83	70.87	85.02	87.87	17.87

7.6 **Sanction & Disbursement**

(a) Sanctions and disbursement made for SHP programmes during 9th Plan

(figures in Rs Crore)

Year	**Sanctions**	**Disbursements**
1997-98	176.05	65.83
1998-99	116.01	70.87
1999-00	143.50	85.02
2000-01	182.92	87.87
2001-02 (upto 31.7.2001)	6.63	17.87

(b) When Committee enquired about reasons for higher sanction and low disbursement, the MNES in a note stated:-

(i) The sanctioned amount is disbursed over a period of 2 to 3 years. (ii) The disbursement is made depending on the progress of the project and corresponding equity brought by the entrepreneur. (iii) Compliance of sanction letter terms with respect to land, various Government clearances such as irrigation, State Electricity Board, Environment and Forest, Power

Purchase Agreement (PPA), State Electricity Regulation Commission (SERC), World Bank procurement procedure, etc.

(c) The following steps were taken to ensure that disbursements are as near sanctions as possible:

(i) State Governments are being requested to implement the single window clearance concept fixing responsibility on one single agency for obtaining all necessary clearances within a state.

(ii) As far as mortgaging of Government land is concerned IREDA has announced a policy in the financing guidelines simplifying the requirements.

(iii) With respect to World Bank Conditions, IREDA is pursuing with World Bank mission on a continuous basis to simplify and relax World Bank procurement procedures.

7.7 On a point of steps taken by IREDA to reduce the time taken for implementation of the project, MNES stated as under:-

i. Regular project reviews at the project sites.
ii. Appointment of Concurrent Monitoring Consultants through project implementation.
iii. One time performance reward @ 0.25% of total loan disbursed for timely completion of the projects as per appraisal.
iv. Appointment of Nominee Director on the Board of Borrower's Company.
v. Quarterly review of each of the project on physical and financial progress.
vi. Special review on the time overrun and cost overrun of projects.
vii. Requesting State Governments to provide policy support, one time performance reward, single window clearance etc.

7.8 Elaborating further, a representative of IREDA clarified as under:-

"In the case of small hydro sector, it is time consuming and the gestation period is two or three years. We have provided for a moratorium of three years considering that the project will take sometime because of the civil construction activity for which clearances have to be obtained from the various governmental agencies and the lead time for procuring the equipment is related to commissioning of the project. Then, from the date of sanction of the loan from IREDA, the borrower is allowed six months time to sign the loan agreement. For signing the loan agreement there are certain prerequisites. First he must have the possession of land. What happens is, in a number of cases taking clearances and possession of land involves a considerable amount of time. So, the borrower comes and asks for extension of the sanction letter. First we provide three months extension and another three months later on. Within that period he is able to come and sign the

loan agreement. After the signing of the loan agreement the disbursement starts. This disbursement starts in proportion to the promoter's contribution that he brings. There are some cases in which promoters are finding difficulties in bringing their contribution. The pattern of disbursement is, approximately 20 per cent of the loan amount is given in the first year, 40 per cent is given in the second year and the remaining 40 per cent is given in the third year. The disbursement is not made at one go. It is based on the periodical progress. Sometimes, if the promoter's contribution does not come in time, then the disbursement will be delayed. Due to civil construction activity, monsoon activity, etc. delays occur and so, we have provided a three year moratorium. This is the reason why there is a difference between the sanction and disbursement figures. The disbursement of the entire loan amount does not take place in the sanction year itself. It takes place over a period of two to three years".

7.9 When asked about rate of interest at which IREDA gets loans from international Financial Institutions and their lending rates for Small Hydel Power Projects, the MNES in their reply stated as under:-

"IREDA extends financial assistance for Small Hydro projects either from its own resources or from the funds earmarked under Lines of Credit sanctioned by the World Bank for this purpose. The cost of funds from International Financial Institutions is between 10.12% to 14% per annum. The average cost of funds from domestic market is 10.56%. The interest rate charged by IREDA for financing SHP projects upto 1 MW is 13.5%, for 1-3 MW capacity projects is 13.75% and for 3-25 MW capacity projects is 14%".

7.10 Besides IREDA, PFC, REC and other FIs are also involved in promotion of SHPs when the Committee desired to know how does the terms and conditions of IREDA differs with the other FIs and what mechanism exists for the coordination of activities of FIs to avoid duplicity, the MNES informed as under:-

"IREDA, PFC, REC and other FIs have been financing small hydro power projects. IREDA provides loan for SHP projects undertaken by the private sector and public sector enterprises. The interest rate for project upto 1 MW is 13.5%, for 1-5 MW capacity projects is 13.75%, 5-15 MW is 14% and for 15-25 MW cost for projects upto 1 MW and 70% of the total project cost for other capacities.

PFC and REC have been involved in financing small hydro power projects both in Government sector as well as private sector. For SHP project upto 25MW, PFC provides loan upto 60% of the project cost at an interest rate of 14.5% with a moratorium till 6 months after commissioning of the project. REC provided loan upto 100% of the project cost for Government sector projects and upto 75% of the project cost of private sector. The interest rate has been 14.5% to 15% and the moratorium period is 3 years. The loan is to be repaid in 10 years.

As per Ministry of Power O.M. No.44/9/99-D(RE) dated 24.11.1999, PFC is now restricting its lending operations to hydel projects of capacity more than 25 MW. The project upto 25 MW are being supported by REC. Other financial institutions such as IDBI, ICICI, IFCI are increasingly becoming interested in financing viable SHP projects and provide loan as per their normal lending institutions in order to avoid duplicity".

7.11 PFC has been barred to extend financial assistance to SHP. When asked whether MNES has taken up the matter with Ministry of Power , the MNES replied as under:-

"As per Ministry of Power O.M. No.44/9/99-D(RE) dated 24.11.1999, PFC is now restricting its lending operations to hydel projects of capacity more than 25 MW. The projects upto to 25 MW are being supported by REC. Since both the organizations are under the administrative control of Ministry of Power, it is a matter of internal allocation of work by Ministry of Power and is not likely to effect the SHP sector. MNES has not taken up this matter with Ministry of Power".

7.12 **IREDA is the primary lending institution in India financing small hydel sector on commercial term basis. Its interest rate varies from 13.50% to 14% for repayment period of 10 years with moratorium of 3 years depending upon the technical status and the client status (manufacturers, users, women, SC & ST and NGOs, etc.). It has infused a large amount of capital into the private sectors through various incentive schemes. It has also successfully mobilized international sources for the small hydel sector. However, the Committee has observed that the cumbersome procedure in availing financial assistance from IREDA dissuade many potential borrowers. The Committee find that IRED has modified their loan portfolio. Now in SHP sector upto 1 MW capacity, the ceiling of IREDA's loan component has reduced from 80% in the year 2000-2001 to 75% in 2001-2002. Similarly for SHP projects of capacity more than 1 MW, this ceiling has reduced from 75% in 2000-2001 to 70% in 2001-2002. It results in increase in minimum promoters contribution from 20% to 25% for the projects upto 1 MW, and for the projects more than 1 MW. It has increased from 25% to 30%. The Committee welcome this action of IREDA in restructuring their loan portfolio. However, the Committee are unhappy to find cumbersome procedure in availing loan. The Committee, therefore, recommend that Government should review the lending**

policy of IREDA laying stress on simplification of lending procedures so that the small hydel potential is harnessed in the country and the burgeoning gap between the demand and supply of power is bridged. The Committee would like to emphasise that IREDA should appraise the projects and all the objections/queries, should be resolved in one go and not piece-meal. IREDA should consider the option of 'on-line sanction' of the project, so that the disbursement of loan could be expedited.

7.13 The Committee find that IREDA is almost the only institution so far as funding of SHPs is concerned. The other Financial Institutions, such as PFC, REC, IDBI, ICICI, IFCI and Commercial Banks play very little role in this field. The Committee desired that the Government should evaluate the performance of such FIs and shortcomings, if any, be bridged so that these FIs, also support SHPs on a large scale, as is being done by IREDA. MNES should also consider the reimbursement of subsidy/incentives through these FIs. At the same time, the Committee would urge IREDA to fine tune their credit policy, so that the benefit of drop in interest rate regime, is passed on to the consumers. The Committee would also like to recommend that Commercial Banks should devise their credit plans, taking into consideration the funding requirement of Small Hydel Sector.

7.14 The Committee have noted that Indian equipment manufactures for SHP projects are able to supply the State-of-the-art equipments in about 4-8 months depending upon the size of the project. In order to avail the MODVAT benefit, 16% Central Excise have been allowed to the small hydro power project equipments. Concessional Custom Duty of 5% + surcharge + AD + SD is also permissible to the goods imported by a manufacturer for manufacture and supply of machinery and power equipment to a power generation plant. However, the Committee are sad to note that 100% accelerated deprecation as admissible to other renewable energy based devices/projects is not available to SHP projects on the ground that most of the equipments like generators, control systems can be used in other power projects also. The Committee are not convinced with the reasoning of

the Government in this regard. The Committee recommend that the 100% accelerated depreciation may be made available to the devices/projects of the small hydel sectors. Needless to say, appropriate monitoring mechanism be evolved by the Government so that the equipments claiming such benefits are used exclusively for Small Hydro Projects.

CHAPTER - VIII

SHP Programme in India vis-a-vis the other Countries

World Scenario in Hydro Development

According to available estimates, the exploitable global hydro power potential is of the order of 15,000 billion units (kwh) annually. The economically exploitable hydro potential of India is about 4% of the global hydro potential but nevertheless rank 5th in the world.

8.2 The world wide hydropower situation indicated that the installed capacity is of the order of 6,60,000 MW, the hydro projects under construction are of the order of 1,26,000 MW and unharnessed potential is of order of 15,00,000 TO 20,00,000 MW. The percentage distribution of installed capacity, under development and undeveloped potential amongst various continents are as under:-

Continent	Installed Capacity (%)	Potential under-development (%)	Undeveloped Potential (%)
Asia	32	62	47
Europe	25	17	5
North America	24	1	6
South America	16	18	25
Africa	3	2	17

8.3 **Countries having substantial hydro share**

The hydro share in some countries is quite substantial ranging from 62% to 100%. A list of such countries is given below:-

Sl.No.	Name of Country	% share of hydro in total capacity
1.	Bhutan	100.00
2.	Congo	100.00
3.	Paraguay	100.00
4.	Zambia	99.89
5.	Nepal	85.70

6.	Zaire	99.70
7.	Norway	99.60
8.	Ghana	97.00
9.	Uganda	98.80
10.	Honduras	90.00
11.	Burundi	100.00
12.	Rwanda	97.70
13.	Cameroon	97.41
14.	Tanzania	87.00
15.	Brazil	96.40
16.	Albania	96.40
17.	Canada	62.00

8.4 There are countries like Norway, Switzerland and Brazil where share of hydro-capacity in the total installed capacity is of the order of 99%, 85% and 95% respectively, hydro share in Canada and France is of the order of 62% and 14% respectively. As against these the hydro share in India is less than 25%.

8.5 Internationally there is a renewed interest in the small hydro power development being economical, non polluting and environmentally benign source of energy ideally suited for remote and hilly areas. Small and mini hydel projects are considered to have potential of providing a solution for the energy problems specifically in the areas where extention of grid system is comparatively uneconomical. World wide there is an interest in the commercial sector to develop, design and build small hydel projects and financial institutions are increasingly becoming interest in evolving new approaches for financing these projects.

8.6 The definition of "Small Hydro" varies from country to country. The most common definition for small hydro is 10 MW or less. However, there are significant deviations. For example, in China small hydro is considered to be smaller than 25 MW, the Philippines classifies small hydro up to 50 MW. In India small hydro is now defined for projects up to 25 MW.

8.7 The current estimated small hydro installed world-wide and small hydro projects under construction and planning are given in Table II & III. It may be seen from the tables that while substantial development has occurred world-wide, Asia has the clear lead. China has contributed more than 20,000 MW small hydro capacity, which is about one-fourth of the total hydro-electric generation capacity in China. Small hydro contributes about 14,000 MW in Europe. France has about 1600 MW, Italy about 2,344 MW and Spain has 1,400 MW small hydro projects. The United States has over 4,000 MW and Canada has 1450 MW small hydro projects installed.

8.8 In our country, the main bottlenecks in implementing the small hydro power programmes are delays in allotment of land, statutory clearances, signing of PPAs, limited working seasons, inadequate power evacuation facilities, etc. When asked how does China tackle the above said problems, the MNES informed:-

"In China, the problems of allotment of land, statutory clearances and PPA etc. have been solved over a period of time. Since SHP development was a mass movement during 1960s-70s, the country geared itself and streamlined procedures have been developed to encourage SHP development and purchase of power by provinces/counties (Districts/States) Electricity companies. While some of these ideas are being tried in our country also, it may require some more time to streamline them".

8.9 China is the World leader in small hydro sector. This sector is contributing about one-fourth of the total hydro generation capacity. On the other hand share of this sector is very low in our country. When asked about the reasons for lower contribution by Small Hydro Power Sector in India, the MNES stated:-

"It may not be correct to say that the contribution of India is low in the SHP sector. The total installed capacity from SHP projects upto 25 MW in India is 1380 MW. This is next only to China and Japan as far as Asian countries are concerned. World over, India ranks among the top ten countries. China has specifically concentrated on the development of SHP projects".

8.10 In China, a large number of SHP projects are owned by the local community with cost sharing from individuals. This aspect has been highlighted by many experts for replication in our country also. It is also suggested by the experts that even very small size projects in the decentralized mode should be developed and equipments for such small projects should be standardized and made available off the shelf. The projects should also be set up in a cascade format. Increasing automation should also be aimed at in order to optimize power generation from the projects. When asked about the steps taken/ to be taken by the Ministry in the light of the experience obtained during the study tour, the MNES stated as under:-

"The SHP programme implemented in our country does take into consideration the experience of other countries. For example, private sector is being encouraged to set up SHP projects. The Ministry is also encouraging local communities, NGOs to set up small size projects. The equipment for small size projects say up to 30 KW has already been standardized by 3 manufacturers and are readily available. The newly initiated village electrification programme from NRSE systems would make extensive use of such systems. The State Governments have started allotting projects to the private sector by adopting a cascade approach. The new projects are being set up with sufficient automation for optimizing the power outputs. The demonstration projects set up under the UNDP-GEF hilly hydro project are being set up with the latest technological features".

8.11 The Committee note the impressive progress of small hydro sector in China. China has contributed more than 20,000 MW of power through small hydro sector, which is about one-fourth (¼) of the total hydro electric capacity in China. However, in our country it is a low-priority sector and merely an 11 years – old programme started in 1989. The Committee feel that like China a mass-movement for the promotion and development of small hydel sector is required in our own country also. For this certain specific problems relating to high-investment cost, lack of demand for electricity at generation sites, the long-time taken in obtaining the necessary approval in the small hydel sector and in acquisition of land particularly the Government land shall be redressed to. In this light, the Committee recommend that Government should streamline their procedures for providing necessary approvals to the small hydro project within specific time period as mentioned in MoU and mutually agreed between the Government agencies and the private developers. The Government should also evolve a remunerative policy for greater participation of private sectors, local people and Non-Governmental Organisations (NGOs).