Monitoring and Evaluation of Forest Area diversions for Non-Forest purpose including the Status of Compliances of Approved Conditionalities and Impact of forest diversion cases on Forest and Wildlife.

(Summer Internship Report submitted in partial fulfillment of Post Graduate Diploma in Forest Management)

Submitted By:

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PGDFM-2009-2011

at

Ministry of Environment and Forests, Regional Office (Western),

Forest Conservation Division of Ministry of Environment and Forest

June 2010

Under the Guidance of

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DECLARATION BY ORGANIZATION

This is to certify that the project report entitled "**Monitoring & Evaluation of Forest Area Diversions Including the Status of Compliance of Approval Conditionalities of Forest Diversion Cases on The Forest & Wildlife – Multipurpose Water Resource Project** " done by **Richa Singh** and **Sonal Khare** (PFM 2009-11) for MoEF is original work. This has been carried out as Summer Internship under my guidance for partial fulfilment of Post Graduate Diploma in Forest Management at Indian Institute of Forest Management, Bhopal.

Place: Bhopal

Date: 14/06/2010

Reporting Officer

Sujoy Banerjee IFS
Deputy Conservator of Forests,
Goverment Of India
Ministry of Environment and Forests
Regional Office Bhopal

DECLARATION BY STUDENT

We, **Richa Singh** and **Sonal Khare** (PFM 2009-11), hereby declare that the project report entitled "**Monitoring & Evaluation of Forest Area Diversions Including the Status of Compliance of Approval Conditionalities of Forest Diversion Cases on The Forest & Wildlife – Multipurpose Water Resource Project**" is an original work. The contents of the project report have not been published before and reflect the work done by us during our Summer Internship of the Post Graduate Diploma in Forest Management at Indian Institute of Forest Management, Bhopal from 05 April 2010 to 11 June 2010 with MoEF.

Place: Bhopal

Date: 14/06/2010

Richa Singh

Sonal Khare

(PFM 2009-2011)

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EXECUTIVE SUMMARY

With the population growth and globalization, there has been a significant increase in the demand of water. The development of water resources has always been given due recognition and importance in our country. Our country has come up with various multipurpose water projects in last 30 years to meet the demand of water by the growing population. As human population grows and expectations of higher standards of living increase, there will be an increasing global water demand. To meet this increased demand more dams will be needed in future.

Multipurpose water projects generally refer to a water retention system which is used to generate electricity, to prevent water shed flooding, provide irrigation, navigation, habitat improvement, improve fishery populations etc. These projects, thus plays an important role in India's substantially agrarian economy.

With the all-round development of water resources, their environmental aspects also came to be noticed. It also led to the realization that the water resources development should be planned in such a manner that it leads to enhancement in the quality of environment rather than its degradation.

This study was done with the objective of checking the Compliance Status of Approved Conditionalities of Forest Area diversions for Non-Forest purpose of various Multipurpose Water Projects. The project also aimed at Monitoring and Evaluation of the impact of the forest diversion cases on the forest and wildlife.

The study area included Multipurpose Water Resource Projects of Madhya Pradesh and Maharashtra. In total six projects were selected, five were in Madhya Pradesh and one was in Maharashtra. Out of the six projects two were under construction and four were completed, also three of the projects were Major projects while three were Medium Projects. This choice of projects was done to get a wide spectrum for study of different projects. The projects selected were Sanjay Sagar Irrigation Project, Vidisha, Omkareshwar Multipurpose Dam, Khandwa, Rajeev Sagar (Bawanthadi) Dam, Maksudangarh Tank, Vidisha, Pehsari Dam, Gwalior and Rampurkhurd Dam, Sehore. Sampling was done for zeroing down to the projects and for selecting the sites for observation. Field visit to the sites such as Compensatory Afforestation site and Catchment Area treatment site, canals dam sites, Command area sites and Rehabilitation and Resettlement sites were carried out for collecting Primary data.

The study also included surveying of villages. The villages were surveyed in detail to review the impact of Dam on the Socio-Economic condition of the villagers and its impact on the environment, ecology and

health of villagers and to give the recommendations for the same. In this regard, structured and unstructured interviews were conducted as per the requirement for collecting the information.

Detailed discussions were also carried out with Forest Department Officials, Forest Guards, Officials of User Agencies and their Engineers.

The major findings of this study revealed that there has been considerable impact on forest and wildlife due to construction of dams. The impact included the loss of rich dense forest whose compensation cannot be done by plantation in patches. Habitat loss of wild animals was also an issue. But the dam sites which were under the study did not support any endangered species. Many violations of Forest (Conservation) Act, 1980 were seen. The violators of the Act were not given strict punishments, fine of just few cores cannot be an escape for violating the Forest (Conservation) Act, 1980. The outcome of the study include the present status report of compliances, impact on forest and wildlife and some recommendations for better results. The study reveals that there were non-compliances of the approved conditionalities.

The conditions of Compensatory Afforestation (CA) were not met in most of the cases. Also the non-forest land which was given for CA was in small isolated patches. The Compensatory Afforestation which was to be done for the compensation of forest being submerged was not carried out seriously. In most of the cases it was observed that the survival rate was poor. The Catchment Area Treatment (CAT) plan was also not done properly. Improper location of the CAT measures, non-maintenance and less number of structures were some of the major weakness which were observed.

In regard to Resettlement and Rehabilitation(R&R), it was observed that in most of the cases the compliances were not being met. The major problem in R&R was non timely distribution of Compensation money, lack of facilities and no priority for oustee in jobs. The outcome of the study also includes recommendations such as permanent demarcation of boundary of the reservoir, permanent monitoring committee, better measures in CA for protection and irrigation. Recommendation regarding tackling encroachment and proper management of database were also given.

Data analysis showed that the best project among the six projects studied, in terms of complying with the conditionalities and maintaining the quality of the conditionalities is Omkareshwar Multipurpose Project. Sanjay Sagar Irrigation Project scored the lowest percentage among the six projects studied.

The findings of this study will help “Ministry of Environment and Forests” to identify the weak points and take corrective actions to correct them. It may result into reviewing their guidelines. The presentation of the study was given before Honorable Minister, Ministry of Environment and Forest it resulted in

orders of the Honorable Minister to review the guidelines for Compensatory Afforestation. The study will also present the picture of major impact on forest and wildlife of the area after the construction of dams and other irrigation project. The outcomes of this report will serve as a primary data to replicate this.

ACKNOWLEDGEMENT

We, Richa Singh and Sonal Khare, of Indian Institute of Forest Management, Bhopal would like to thank Mr. Jairam Ramesh, Minister of State (Independent Charge), Ministry of Environment and Forests for giving us an opportunity to intern with the Ministry. We would like to thank our Reporting Officer Mr. A.K.Rana and Mr. Sujoy Bannerjee for giving us their valuable time and advice.

We would also like to thank the Principal Chief Conservator of Forest, Madhya Pradesh and Maharashtra, Chief Conservator of Forest, Bhopal ,Gwalior and Nagpur , Conservator of Forest, Bhopal, Gwalior, Khandwa, Nagpur and Vidisha, Range Officer, Bhandara, Lateri, Nagpur, Omkareswar, Shamshabad, Sehore and Vidisha and Forest Guards of different project area related compartments of Forest Division.

We owe our acknowledgement to Executive Engineers, Assistant engineers, Staffs of respective User agencies of assigned Hydro-Power and Irrigation projects.

We would also wish our gratitude towards the entire team of Regional Office (Western), Ministry of Environment and Forest, Bhopal for their constant support during the entire course of the project.

We would specially like to thank our Summer Internship Chairperson, Dr. C.V.R.S. Vijaya Kumar, Faculty, Indian Institute of Forest Management, Bhopal for providing us the support, guidance and opportunity to work on this project. We are also deeply grateful to Capt. Anil Khare, Prof A.K.Dharni, Prof. Yogesh Dubey, and Prof. H.S.Gupta of Indian Institute of Forest Management, Bhopal and Dr. R.B.Lal, Director, IIFM, Bhopal for giving us their valuable time and support and providing us the confidence to complete this project.

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Chapter 1: Host Organization

1.1 About Ministry of environment and Forest

The Ministry of Environment & Forests (MoEF) is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing the implementation of India's environmental and forestry policies and programmes.

The primary concerns of the Ministry are implementation of policies and programmes relating to conservation of the country's natural resources including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution. While implementing these policies and programmes, the Ministry is guided by the principle of sustainable development and enhancement of human well-being.

The Ministry also serves as the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), and International Centre for Integrated Mountain Development (ICIMOD) and for the follow-up of the United Nations Conference on Environment and Development (UNCED). The Ministry is also entrusted with issues relating to multilateral bodies such as the Commission on Sustainable Development (CSD), Global Environment Facility (GEF) and of regional bodies like Economic and Social Council for Asia and Pacific (ESCAP) and South Asian Association for Regional Co-operation (SAARC) on matters pertaining to the environment.

1.2 Objective

The broad objectives of the Ministry are:

i. Conservation and survey of flora, fauna, forests and wildlife
ii. Prevention and control of pollution
iii. Afforestation and regeneration of degraded areas
iv. Protection of the environment and
v. Ensuring the welfare of animals

These objectives are well supported by a set of legislative and regulatory measures, aimed at the preservation, conservation and protection of the environment. Besides the legislative measures, the National Conservation Strategy and Policy Statement on Environment and Development,

1992; National Forest Policy, 1988; Policy Statement on Abatement of Pollution, 1992; and the National Environment Policy, 2006 also guide the Ministry's work.

1.3 Project clearances

All the projects undergo clearances. These can be environment clearances and forest clearances.

1.3.1 Environment Clearances

Environmental Impact Assessment (EIA) is an important management tool for ensuring the optimal use of natural resources for sustainable development. Environmental Management or planning is the study of the unintended consequences of a project. Its purpose is to identify, examine, assess and evaluate the likely and probable impacts of a proposed project on the environment and, thereby, to work out remedial action plans to minimize adverse impact on the environment.

The Ministry has issued the Environmental Impact Assessment Notification, 2006, which makes environmental clearance mandatory for the development activities listed in its schedule.

1.3.2 Forest Clearance

The Forest (Conservation) Act, 1980 came into force with effect from October 25, 1980. Under the provisions of this Act, prior approval of the Central Government is essential for diversion of forest lands for the non-forestry purposes. In the national interest and in the interest of future generations, this Act, therefore, regulates the diversion of forest lands to non-forestry purposes. The basic objective of the Act is, to regulate the indiscriminate diversion of forest lands for non-forestry uses and to maintain a logical balance between the developmental needs of the country and the conservation of natural heritage.

Any project undergoes both environment and forest clearances. Our study includes forest clearances only. Our project mainly includes study of forest clearances i.e. we need to study those projects which involves diversion of forests land and under those diversion cases there are some conditionalities which are to be followed up. Main focus is on checking of these conditionality, whether they have been approved or not, also whether there have been violation of forest act, the causes of such violations etc.

1.4 Compensatory Afforestation Management and Planning Authority (CAMPA)

1.4 Compensatory Afforestation Management and Planning Authority

1.4.1 Aims and Objectives of State CAMPA

The aims and objectives is to promote:

(i) Conservation, protection, regeneration and management of existing natural forests;

(ii) Conservation, protection and management of wildlife and its habitat within and outside protected areas including the consolidation of the protected areas;

(iii) Compensatory afforestation;

(iv) Environmental services, which include:-

a) provision of goods such as wood, non-timber forest products, fuel, fodder and water, and provision of services such as grazing, tourism, wildlife protection and life support;
b) regulating services such as climate regulation, disease control, flood moderation, detoxification, carbon sequestration and health of soils, air and water regimes;
c) non-material benefits obtained from ecosystems, spiritual, recreational, aesthetic, inspirational, educational and symbolic; and
d) Supporting such other services necessary for the production of ecosystem services, biodiversity, nutrient cycling and primary production.

(v) Research, training and capacity building.

1.4.2 The Functions of State CAMPA

(i) Funding, overseeing and promoting compensatory afforestation done in lieu of diversion of forest land for non-forestry use under the Forest (Conservation) Act, 1980

(ii) Overseeing forest and wildlife conservation and protection works within forest areas undertaken and financed under the programme.

(iii) Maintaining a separate account in respect of the funds received for conservation and protection of Protected Areas.

(iv) Creating transparency for the programme and mobilizing citizen support; and

(v) Earmarking up to two percent of the funds for monitoring and evaluation.

Chapter 2: Introduction

2.1 Background

The development of water resources has always been given due recognition and importance in our country. Indian history contains description of numerous irrigation and water works constructed from time to time in order to fulfill the agricultural, municipal, and other needs of the people.

With the all-round development of water resources, their environmental aspects also came to be noticed. It also led to the realization that the water resources development should be planned in such a manner that it leads to enhancement in the quality of environment rather than its degradation. With the above objectives in view, the Ministry of Environment and Forest has been stipulating certain environmental safeguards while clearing the projects. These safeguards are to be implemented along with the construction of the projects. In order to assist the concerned authorities in monitoring the implementation of these safeguards, guidelines were brought out by the Central Water Commission during 1996.

Prior to 1978, all major and medium river valley projects were examined at the Centre by Central Water Commission in respect of their technical feasibility and economic viability, before their acceptance by the Planning Commission in the development plans of various States. However, with the constitution of the Department of Environment and Forests during 1978, the clearance of all major irrigation, multipurpose and flood control projects from the environmental angle became obligatory. The project authorities are required to furnish the detailed project report to the Ministry of Environment and Forests for scrutiny along with other requisite information in the specified Performa and furnish the Environmental Impact Assessment (EIA) Studies, Environmental Impact Statements (EIS) and the Environmental Management Plans (EMP) etc. The project is considered by the Expert Committee for River Valley and Hydro-electric projects which decides about the acceptance of the project from the environmental angle. However, certain environmental safeguards are stipulated, wherever necessary. These safeguards need to be implemented by the project authorities along with the construction activities of the project.

The Forest (Conservation) Act, 1980 came in to force with effect from October 25, 1980. Under the provisions of this Act, prior approval of the Central Government is essential for diversion of forest lands for the non-forestry purposes. In the national interest and in the interest of future generations, this Act, therefore, regulates the diversion of forest lands to non forestry purposes. The basic objective of the Act is, to regulate the indiscriminate diversion of forest lands for non forestry uses and to maintain a logical balance between the developmental needs of the country and the conservation of natural heritage. The, guidelines have been issued under the Act from time to time, to simplify the procedures, to cut down

delays and to make the Act more user friendly. To ensure this, recently, new rules under this Act have been framed and notified on 10/1/2003 by the Ministry of Environment and Forests.

The Act has succeeded in controlling the indiscriminate release of forest land for non forestry purposes. Prior to 1980, the rate of diversion of forest lands for non forestry purposes was about 1.43 lakh ha. per annum. But, with the advent of the Forest (Conservation) Act, 1980, the rate of diversion of forest lands has come down to around 15000 ha. per annum and mostly diversion of forest land is allowed to meet the developmental needs for Drinking water projects, Irrigation projects, Transmission lines, Railway lines, Roads, Power projects, Defense related projects, Mining etc. For such diversions of forest lands for non forestry purposes, compensatory afforestation is stipulated and catchment area treatment plan, wildlife habitat improvement plan, rehabilitation plan etc. are being implemented, to mitigate the ill effects of diversion of such vast area of green forests. To monitor the effective implementation of the compensatory afforestation in the country, an authority named as "Compensatory Afforestation Management and Planning Authority (CAMPA)" is being constituted at the national level. A monitoring cell is also being set up in the Ministry of Environment & Forests to monitor the movement of proposals at various stages and the compliance of the conditions stipulated in the forestry clearances by the user agencies.

Multipurpose water projects generally refer to a water retention system which is used to generate electricity, to prevent water shed flooding, provide irrigation, navigation, habitat improvement, improve fishery populations etc. Thus this has more than one use. Multi-Purpose dams hold water for various seasonal, domestic and irrigation uses. Each is designed to regulate seasonal storage, to control spring and summer flood water and to store water for summer use. Stock watering, wildlife habitat, etc are other common uses.

The multi-purpose river valley project plays an important role in India's substantially agrarian economy. These projects aim at providing irrigation water and power inputs which then enhances food productivity. Such project involves construction of several large, medium and small dams on rivers with purpose of providing irrigation and generation of electricity. Dams have been used for thousands of years to regulate river flows and ensure adequate supply of water during dry periods. As human population grows and expectations of higher standards of living increase, there will be an increasing global water demand. To meet this increased demand more dams will be needed in future. Thus such development projects are implemented for their direct benefits. These projects transmit benefits to distant places. Large dams are essential for the well-being of many millions of people and have played a key role in human development.

The positive impacts caused by dams are:

i. Their capacity to generate hydroelectric power and thus provision of electricity to nearby places.
ii. Increase agriculture production in far stretching areas.
iii. Through provision of reliable water supplies, production of energy and creation of recreational opportunities, dams have improved the economic and social well-being of many millions of people.
iv. Dams are the most important means of making surface water available at the place and time of demand.
v. Creates new habitats through the reservoirs.
vi. Large dams provide flood protection.
vii. Hydro-power is a clean energy source.
viii. In developing countries like India where population is increasing at a greater pace, dams are needed for the continuous supply of water.
ix. Continuous supply of water for irrigation to the farmers.
x. Bring nation's development.
xi. Encourage tourism also.
xii. Scope for recreational activity.

Dams are one of the most significant human interventions in the hydrological cycle. The responses of river ecosystems to dams are multiple, varied and complex. They depend not only on the dam structure and its operation but also on local sediment supplies, geomorphic constraints, climate, and the key attributes of the local biota. The dam construction results in physical, chemical and biological changes to natural ecosystem. There are numerous irrigation and hydro-power projects affecting major chunks of forest and wildlife due to the submergence effect.

In recent years these dams and multipurpose projects have come under great opposition because of the several reasons. These reasons are social, environmental, economical and others. The primary reason for the resistance is displacement of large number of people. The concern in regard to environmental damage due to the diversion of great forest area along with the destruction of biodiversity is also increasing. The various negative impacts caused by dam are:

i. Dams constitute obstacles for longitudinal exchange along rivers and disrupt many natural environmental processes.
ii. It leads to massive loss of forests and wildlife.

iii. It results in the permanent destruction of terrestrial ecosystems through inundation.
iv. It also leads to fragmentation of natural habitats.
v. Dam induces water logging and salinity.
vi. Large dam flood the valleys upstream and directly or indirectly transform the nature and productivity of ecosystems.
vii. Reduced fresh water discharge in dry season in rivers near their mouth causes salinity and affects water quality.
viii. Fisheries also get affected due to the barriers created.
ix. Entire aquatic flora and fauna gets disturbed.
x. Dam also affects the social life of people. The resettlement and rehabilitation affect the lifestyle and culture of the affected persons.
xi. It also causes increased pressure on residual forests and other common lands which further leads to accelerated degradation.

The key to environment friendly and sustainable agricultural productivity depend upon our ability to conserve biodiversity in all the ecosystems. Lot of considerations should be taken into account and should be reviewed before the initiation of such projects and if it is not done properly, the value of the project is greatly reduced.

2.2 Objective of the project

2.2.1 Primary objective

Monitoring and evaluation of status of compliances of approved conditionalities for diversion of forest land for non forest purpose in case of the multipurpose water resource project and assessing the impact on forest and wildlife of the same.

2.2.2 Sub-Objectives

i. To determine the parameters to be assessed to check the status of the compliances.
ii. To visit the Dam and Canals sites and concerned areas which include Catchment Area Treatment site, Command Area Development site, Compensatory Afforestation etc.
iii. To evaluate the impact of forest area diversions on forest and wildlife.
iv. To visit the affected villages and rehabilitation sites and assess the issues related to the Resettlement and Rehabilitation.

2.3 Need for the project

Under the provisions of the Forest Conservation Act, 1980 prior approval of the Central Government is essential for diversion of forest lands for the non-forestry purposes. In general social and national interest

and in the interest of the future generations, this Act therefore regulates the cases of diversion of forest land to the non forestry purposes. The basic objective of the Act is, to regulate the indiscrimination diversion of the forest land for the non forestry uses and to maintain the logical balance between the development needs of the country and the conservation of the natural heritage. While diverting the land for non forestry purposes the MoEF imposes certain Conditionalities on the uses agencies which need to be monitored after commencement of such projects on regular basis. The proposed project intends to evaluate the extent to which such Conditionalities are being addressed by the user agencies as per the requirement of FCA and also to assess the impact of the project on the forest and wildlife.

2.4 Expected Outcome of Study

The outcome of the study would be highlighting the loopholes in complying with the conditionalities. It would also bring into attention the Rehabilitation and Resettlement Issues which goes neglected. The study might result into the reviewing of the policies and guidelines for Forest Clearances at Ministry level. The study would also bring in the problems related to the Compensatory Afforestation and Catchment Area Treatment.

Chapter 3: Literature Review

The World Commission on Dams (WCD) has been established to undertake a global review of the development effectiveness of large dams and assessment of alternatives.

In a paper presented by M.P. McCartney, C. Sullivan and M.C. Acreman on "Ecosystem Impacts of Large Dams ", they came up with a view that Dams have been used for thousands of years to regulate river flows and ensure adequate supply of water during dry periods. They also highlighted that in the future, as populations increase and water consumption rises, there will be a need for more dams. However, in recent years proposals for new dams have, in many places, aroused intense opposition. There are many social and economic arguments used against dams, but underpinning many of these arguments is the fact that dams, particularly large dams, produce major ecological changes in river ecosystems.

Talking about the sustainable development, Rao and Kaushik suggested Environmental Impact Assessment as an effective tool for measurement of impacts due to development activities. Environmental monitoring is essential to ensure that whatever impact occurs is found at the earliest opportunity.

M.I.Beg and R.N.Srivastava highlighted the main constraints to the faster pace of hydro development. These constraints are inadequate financial resources, problems relating to environmental issues, uneven distribution, and organizational set up for hydro electric development among the various states, interstate disputes on sharing of water resources, lack of technological up gradation, problems relating to land acquisition and geo-political factors. According to them, the major issues relating to hydro-power projects are the catchment area treatment, submergence of large areas of land, human habitats and their rehabilitation aspects and deforestation etc. They also laid emphasis on Catchment Area treatment as an important tool for consideration specially for saving forest area from further degradation.

Not only this, a study by multidisciplinary team from Wildlife Institute of India (WII), India stated that submergence of agricultural land, forest stretches and wildlife habitats and less than adequate rehabilitation package for the affected people can be the major direct impacts of such multipurpose river valley projects and these set off more complex but significant impact s resulting from diversion, decimation and fragmentation of forests.

Asit K. Biswas in his book," Environmental Planning, Management, and Development" highlighted that the most fundamental problems that has been created due to the absence of monitoring and evaluation of water development projects is the validity of the hypotheses that are being used to make forecasts during

the EIA process. In the absence of monitored results the hypothesis on which EIA forecasts are based cannot be validated and leading to biasness and errors which are perpetuating globally.

Dixon, Scura, Carpenter and Sherman in their book, "Economic Analysis of Environmental Impacts" considered environmental issues as fundamental to both social and economic development. Government in developing countries has become increasingly aware that environment and natural resource degradation endangers the potential for long term development. In the same book these people stated their anguish towards developing countries where the socio-economic effects of degraded environment hit the poor hardest. As these people work hard on land and are directly dependent on natural resources for their food, shelter and environment. They also suggest that economic development depends on the rational use of environmental resources and on minimizing as far as possible the adverse impacts of development projects. And this can be achieved by improving project selection, planning, design and implementation.

Chapter 4: Methodology

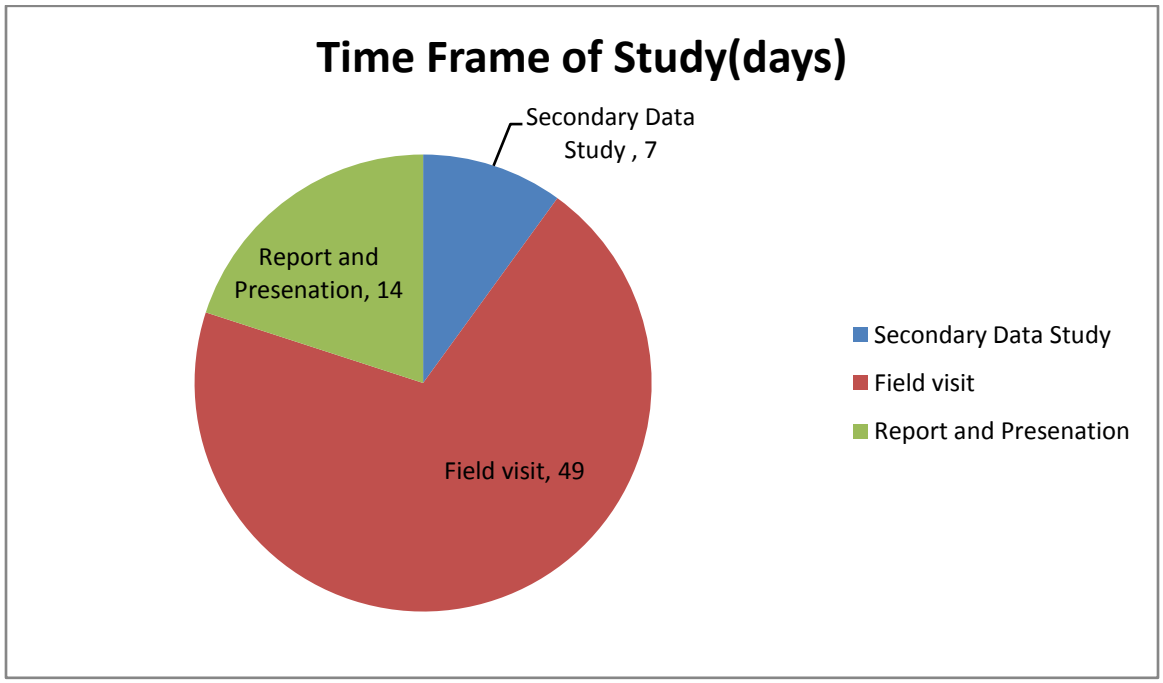
4.1 Approach

The study involved monitoring of the approved conditionalities for multipurpose water projects. The methodology included first selecting the projects so, that they would cover a wide spectrum of projects. Study of the related reports, proposals and documents was the next step. Information was gathered from various sources for the selected projects. Field visits were planned for monitoring various conditionalities sites like Compensatory Afforestation sites, Catchment Area Treatment sites, Canal sites, Command area sites and Rehabilitation and Resettlement sites. Observations, questionnaires filling and interviews were done for getting the primary data. Finally, data analysis was done and recommendations were proposed.

4.2 Time Frame

The time duration of study was ten weeks which equals to 70 days. Below is the time distribution for various components of study.

Graph 1: Time Frame



Maximum time was given for field visits; it also included study of secondary data from the user agencies and various Forest Departments. Presentations were conducted separately before the Reporting Officer and Honorable Minister of Environment and Forests, Mr. Jairam Ramesh.

4.3 Research Design

The study was a onetime study thus cross-sectional in nature. Sampling was done for selecting various projects in Madhya Pradesh and Maharashtra. Sampling frame was the list of the projects provided by the Regional Office (Western), Ministry of Environment and Forests (MoEF) , Bhopal, M.P. Only six samples were to be selected from the complete lists of Major Projects and Medium Projects, three from each list. Thus the sample size was six and Non-Random, Purposive Sampling was done to select the samples. On the basis of the available time and information and distance of the sites from the dam site, various observation sites were selected.

4.4 Sites Selected

Sites selected and visited for Compensatory Afforestation (CA) under the projects were:

Table 1: CA Sites Visited

S.No.	Project Name	Sites selected and visited
1.	Sanjay Sagar Wah Irrigation Project, Vidisha	Dangarwada
2.	Omkareshwar Multipurpose Dam, Khandwa	Kothi helipad
3.	Rajeev Sagar (Bawanthadi) Irrigation Project, Bhandara	Gorewada and Ambajhari
4.	Maksudangarh Tank, Vidisha	Tajpur,Mahawan and Chanderi
5.	Pehsari Dam, Gwalior	`Mohana and Sikrawali
6.	Rampurkhurd Tank, Sehore	CA was not done.

(Source 1: pers obs)

Due to time restraint the actual number of sites for CA was not covered. In Rampurakhurd Tank no CA was done so no sites were visited.

Sites selected and visited for Rehabilitation and Resettlement (R & R) were:

Table 2: R&R Sites Visited

S.No.	Project Name	Sites Selected and Visited
1.	Sanjay Sagar Wah Irrigation Project, Vidisha	Dangarwada and Laadhpur
2.	Omkareshwar Multipurpose Dam, Khandwa	Kothi helipad, Pankhayaat and Gunjari
3.	Rajeev Sagar (Bawanthadi) Irrigation Project, Bhandara	Khapa Khurd and Garra Bagedha
4.	Maksudangarh Tank, Vidisha	Mahawan
5.	Pehsari dam, Gwalior	Not Required as no village under

		submergence
6.	Rampurakhurd Tank, Sehore	Narpakhedi

(Source 2: pers obs)

In Pehsari no village was resettled as no village was submerged.

4.5 Tools of data collection

4.5.1 Primary Sources

The primary data was generated through direct observations done in the fields for CA, CAT, R&R and Canals etc .Along with this Primary Data was also collected through Questionnaire designed for villagers, and interviews of different Forest Department Officials. The desk review of number of documents facilitated the process of questionnaire designing. A list of elements was identified to be incorporated in the questionnaire after the desk review. The main components of questionnaire were:

i. The first part had questions related to information of village, its status as regard to rehabilitation.
ii. The second part was related details of the villagers including the land and cattle they possess before and after Dam construction.
iii. The third part was related to the details of public hearing, compensation, and livelihood.
iv. The lastly problems faced by the villagers were asked.

Group Discussions were also conducted in the village. In addition to that, data was collected by meeting or telephonic conversation with the following officials:

i. Executive Engineers of User agencies.
ii. Officials of Irrigation Departments

4.5.2 Secondary Data

The secondary data was collected from the files and documents at Regional Office (Western),Ministry of Environment and Forests, files from various concerned Forest Departments and User Agencies , internet and various reports.

4.6 Limitations of the study

i. A little difficulty in understanding local language complicated the process of data collection.
ii. Lack of proper and detailed maps to guide on field.
iii. Extreme high temperatures (45 – 49 degree Celsius) also interrupted in the study.
iv. Lack of proper knowledge of the locations by the Forest Guards. As some of them joined recently and thus were new to the areas.
v. Dense forests and hilly terrain of some regions

Chapter 5: Study Areas

The study area included multipurpose water project of Madhya Pradesh and Maharashtra. In total six projects were studied. Out of which five were from Madhya Pradesh and one was from Maharashtra. The following were the project done in Madhya Pradesh.

1. Sanjay Sagar Wah Irrigation Project, Vidisha.

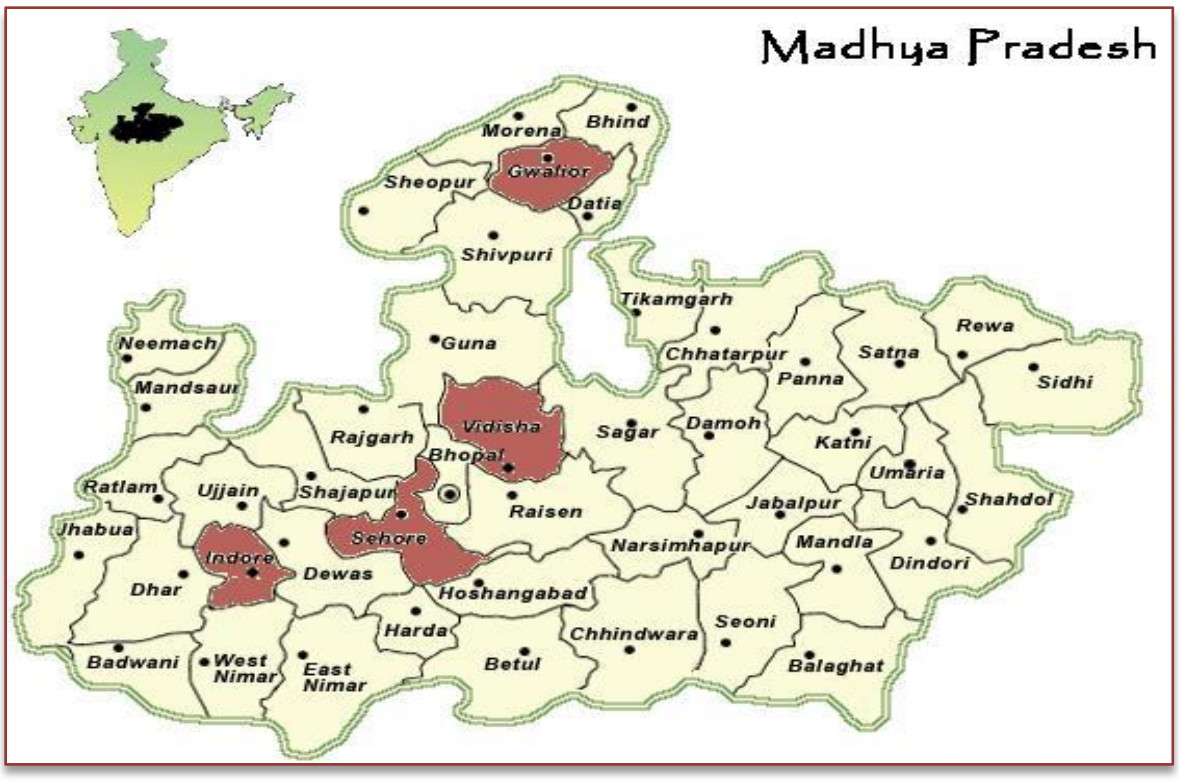
2. Omkareshwar Multipurpose Project, Khandwa (Indore).

3. Maksudangarh Tank, Vidisha.

4. Pehsari Dam, Gwalior.

5. Rampurkhurd Tank, Sehore.

Map 1: Madhya Pradesh Sites Visited



(Source 3: Google maps)

The Project done in Maharashtra was:

1. Rajeev Sagar (Bawanthadi) Irrigation Project, Bhandara

Map 2: Maharashtra Sites visited

(Source 4: Google Maps)

The table below shows the details of the Projects studied.

Table 3: Details of projects

Project name	Year of approval	Total submergence(ha)	Total Forest submergence(ha)	Status as on May 2010
Sanjay Sagar Irrigation Project	2005	1956	304.0	Under Construction
Omkareshwar Multipurpose Dam	2004	12752	5829.85	Completed
Rajeev Sagar (Bawanthadi)Irrigation	1989	4577	2382.28	Under Construction

Project				
Maksudangarh tank	1993	213.70	129.53	Completed
Pehsari Dam	1987	769.76	769.76	Completed
Rampurkhurd Tank	1990	539.93	286.57	Completed

(Source 5: Reports of respective forest division)

Only two projects were under construction, rest four where completed projects. All projects were Government Project except Omkareshwar which was under Narmada Valley Development Authority (NVDA).

5.1 Project Details

5.1.1 Sanjay Sagar Wah Irrigation Project, Vidisha

Sanjay Sagar Wah irrigation project was being carried out in Nateran Tehsil of Vidisha district on river Wah. The location of dam was about 10 Km from Shamshabad town which was about 70 Km from Bhopal on Bhopal-Berasia road. Under this project an earthen dam was to be constructed of height 26.47 mt and length 1295.75 mt. And one 294.25 meters long concrete dam was to be constructed. Forest land under submergence was to be 304 ha and a total of 1956 ha land will be submerged. According to this project, 33 villages of Vidisha and 7 villages of Berasia Tehsil of Bhopal will get irrigation. So, total 9893ha land of 40 villages would be getting water for irrigation. The main canal is 31 kilometers in length while the distributaries were to be of 56.60 kilometers. The total cost of project was estimated to be 13518 lakhs, but due to delay in project the cost has increased. A large part of the proposed submergence area falls in agriculture fields and only a small part of forest on banks of inflowing rivers would be inundated. The state Government sought first clearances for a major irrigation project which was rejected, therefore again the proposal for the project as Medium Irrigation Project was put, which got its approval in 2005.

5.1.2 Omkareshwar Multipurpose project

This is a multi-purpose project planned across river Narmada in the Narmada Basin complex. The project consists of the construction of a concrete dam with gated spillway with the purpose of irrigating about 2.83 lakhs hectares of land annually and also of generating power with an installed capacity of 520 MW. The dam is located in Khandwa district which is 77 kms away from Indore City. There is a common carrier canal of 10.64 kms. This canal further bifurcates into right and left bank canals of the length 142 kms and 53.56 kms respectively. The extent of forest land proposed under this project is 5829.850 ha.

The Omkareshwar Project was one of 30 large dams to be built in the Narmada Valley and which was being contested by one of India's strongest grassroots movements. In Spring 2004 MIGA, the World Bank's Investment Guarantee Agency, turned down an application for Omkareshwar because of "environmental and social concerns". The project was to displace 50,000 small farmers and flood up to 5800 hectares of one of Central India's last intact natural forests. Construction of the dam was taken up in November 2003, in spite of the fact that no Environmental Impact Assessment and no resettlement plan had been prepared for the project. The project violated a number of national and international standards, including the so-called Equator Principles. Although it had been turned down by Deutsche Bank, several foreign banks and export credit agencies were still considering loan and insurance applications for Omkareshwar.

5.1.3 Rajeev Sagar (Bawanthadi) Irrigation Project

Rajiv Sagar (Bawanthadi) Project is a joint venture of the states of Madhya Pradesh and Maharashtra, was a Major Irrigation Scheme under construction on the river Bawanthadi. The Dam site is near village Kudwa in Katangi Tehsil of Balaghat district in M.P. and village Sitekasa of Tumsar Tehsil of Bhandara district in Maharashtra. The construction of dam and Left Bank Canal has been carried out by Madhya Pradesh and that of Right Bank Canal has been carried out by Maharashtra while the cost of the dam has been shared equally by the two states. The cost of L.B.C. and R.B.C. has been borne by Madhya Pradesh and Maharashtra respectively. On completion, the project was proposed to irrigate 18,615 Ha. land of Balaghat district in M.P. by Left Bank Canal and 17,537 Ha. land in Bhandara district in Maharashtra by Right Bank Canal. At 158% Crop Intensity 29,412 Ha. land of Balaghat District and 27,708 Ha. land of Bhandara District was to be irrigated.

The 6420 m long main dam consists of earthen embankment at both the flanks, 220 m long masonry dam in the river portion with maximum height of 31 m, having 110 m long non over flow section. Six number 15 m x 12 m. size Radial gates have been provided to discharge flood water of 12616 cumecs. at F.R.L. 344.40 m. The gross reservoir capacity is 280.241 Mm3 and live capacity is 217.32 Mm3.

The 80.52 Km. long left Bank canal having head discharge of 22.275 Cumecs will irrigate 18615 Ha. land of 97 villages of Katangi and Waraseoni Tehsil of Balaghat District in M.P.

The 26.60 Km. long right bank canal having head discharge of 21.00 Cumecs will irrigate 17,537 Ha. land of 85 villages of Tumsar Tehsil of Bhandara District of Maharashtra state. It was proposed to complete the project by June 2010

As per condition imposed the Govt. of India ministry of environment & forest for clearance of forest case the amount of N.P.V. C.A.T. of Rs. 41.34 Crores has already been paid. The amount of N.P.V. CAT of

Maharashtra Govt. has already been paid i.e. Rs. 74.565 Crores and the compliance reports already submitted to the concerned forest deptt. M.P. & M.S. for onwards submission to G.O.I. ministry of environment in forest New Delhi for according to final approval deposited to the D.F.O. South (T) Dn. Balaghat.

5.1.4 Maksudangarh Tank Project, Vidisha

Maksudangarh Tank Project envisaged construction of an earthen dam/storage reservoir of 2018 ft long and 74.35 ft high near village Ari, Tehsil Lateri, Dist Vidisha. It is located on river Barhed.The dam site is approachable by Sironj road, 6 Km away from Maksudangarh Village and 86 Km away from district head-quarter Guna. It is a minor irrigation project. The canal system is 25 kms long. The catchment area is 65.63 sq kms. The project was planned to irrigate 1943 ha of land (Net C.C.A.) with 122.90 % of irrigation intensity in 11 villages of Raghogadh Tehsil, Guna. The project used 129.53 ha of forest land. Although the reservoir was constructed in Vidisha district but the irrigation benefit is being given mainly to Guna district.

The details of Canal system is as under.

Table 4: Details regarding the canal system and land use break up

S.No.	Components	Unit	Length
1.	Main canal	1	12 kms
2.	Distributaries	1	5 kms
3.	Minors	5	8 kms
4.	Number of villages served	11	
5.	Gross Command area		2723 ha
6.	Culturable Command area		1943 ha
7.	Net C.C proposed irrigation		1843 ha
8.	Intensity of irrigation		122.90%

(Source 6:reports of Bhandara FD)

Construction of canals was completed and it was used for irrigation.. But there were issues regarding the use of the land for canal construction.

5.1.5 Pehsari Dam, Gwalior

Construction of Pehsari dam in district Gwalior was started in the year 1978 as a component of Sindh Project Phase-I to supplement the drinking water requirement of Gwalior town as well as irrigation of 33,000 acres under the command of Feeder canal and Sank Swaran Rekha Link canal.

For the construction of Pehsari tank ,affected forest land of 769.760 hectare was given clearance by Government of India vide letter no 8-109/84/FC dated 29/1/1987 with all conditions which were to be followed, but before final approval from the Government in the yearjune,1984 .,dam was constructed and water was stored due to which the forest land under submergence could not be clear felled and 21958 trees came under submergence, and since the trees were not felled by the forest department then, the department suffered a loss of Rs 479640. Till date the compensation has not been paid by the user agency, Irrigation department, Gwalior, even after reminding them continuously through letters from last few years. When in the year 1987 the water level was low 200 ha land was clear felled and rest 153.10 ha was not able to be felled as the tank was full. In the year 1990 again 47 hectare land was clear felled and rest of the land was not felled since the area was full of water. Rest of the land was not been able to cut because the land was swampy and felling was not possible also the compensation which was given for felling of the trees was less hence 106.10 hectare land was not felled. and hence it was said that it was due to the irresponsibility shown by the irrigation department. On an average 159 trees/hectare was there in the submergence area.

5.1.6 Rampurakhurd tank, Sehore

The project site is situated 35 Km upstream of Ashta town, which lies halfway in between Bhopal Indore highway. The town remained in grip of serious water crisis during summer. Construction of this tank will be helpful in solving such problem. The large impounded storage will help recharge the ground water table in this region thereby increasing yield of wells and tube wells. Rampurakhurd medium irrigation project have a design irrigation potential of 8200 acres. The construction of dam was taken up in 1978. But since the submergence area involved forest lands, nalla closure etc, work had to be stopped pending clearance from Government of India**.**

5.2 Forest land under submergence

5.2.1 Sanjay Sagar Wah Project

304.00 ha of forest land get submerged. However a large part of the submergence area falls in agriculture fields and only a small part of forest banks of inflowing rivers get inundated. The forest flora on the project site including submergence chiefly consists of Butea monosperma. Soil depth was medium to shallow with gravelly coarse fragments. Wild animals were seen but rarely.

5.2.2 Omkareshwar Multipurpose Project

The dam reservoir submerged 5829 ha of forests. These forest harbored nilgai, spotted dear, leopards, tigers, sloth bears and many more. Not only the plantation in these forests comprised of high quality teak, it was home to some 130 species of birds which were destroyed. At full reservoir level, the project will submerge 93 sq km including up to 5800 ha of forest lands and some 30 villages in the Khandwa and Dewas Districts of Madhya Pradesh.

The table shows land used for the project.

Table 5: Land Requirements

1.	**Forest land**	In hectares
	Reserved and Protected Forest	5350.090
	Revenue Forest	479.750
2.	Revenue Land	1432.560
3.	Private Land	8336.440
	Total	15,598.850

(Source 7: Reports at Regional Office)

The forest land under submergence included rich natural forest areas along the North and South banks of the Narmada as well as very fertile agricultural lands.

5.2.3 Rajeev Sagar (Bawanthadi) Irrigation Project

The Govt. of India Ministry of Environment and Forest vide their letter No.8-478/82-FC/ Dated 28/4/89 have accorded approval for transfer of 1940.02 Ha. Forest land of M.P. and 2448.10 Ha. forest land of Maharashtra..As per condition imposed the Govt. of India ministry of environment & forest for clearance of forest case the amount of N.P.V. C.A.T. of Rs. 41.34 Crores has been paid. The amount of N.P.V. CAT of Maharashtra Govt. has been paid i.e. Rs. 74.565 Crores and the compliance reports were submitted to the concerned Forest Department (deptt.) M.P. & M.S. and final approval was got.
Particulars of land proposed to be acquired by project authority are given below.

Table 6: Details of land acquired

Details	Land approved By Government Of India(GOI)(ha)	Land Surrender to Forest Department(ha)	Land Acquired (ha)
Forest Land			
Head Works	4006.50	579.591	3148.79

Canals	1687.559	313.150	484.16
Total	5694.059	892.741	3632.95
Private land			
Head Works	1127.62		10537.62
Canals	1214.01		850.99
Government Land			
Head Works	211.00		211
Canals	472.00		80.00

(Source 8: Documets At Bhandara FD)

In this project two States were involved the land acquisition details included the total land acquired by both the states.

5.2.4 Maksudangarh Tank Project

129.53 ha of forest land which was diverted for this project were located in protected forest compartments under Lateri forest block, Lateri range of Vidisha. This forest area was covered with good tree having crown density from 0.6 to 0.7. teak was the dominant species in the submergence area. Other species included Khair, Saja, Sinha, Dhavda, Palash etc. The forest area comprised of 76000 trees as per the enumeration statement. The area was being managed under the "Coppice with reserve" silvicultural system as per the working plan.Wild animals like Nilgai, Samber, Chital were found in that area. However the area was neither the part of any National Park, sanctuary, nature or Biosphere Reserves nor it was the breeding ground of any species.

The table below shows the forest land diverted for different work under the project.

Table 7: Details of the forest land under submergence

S.No.	Purpose	Forest land(ha)
1.	Dam line	3.26
2.	Submergence	121.89
3.	Canals	4.26
4.	Approach roads	0.12
	Total	129.53

(Source 9: Reports at Vidisha FD)

As the area diverted was very small this project was categorized as Medium Project.Forest area coming under submergence between FRL and 2 Mt below FRL is 24.59 ha and between FRL and 4 mt below

FRL is 68.62 ha. Also two Km of the then existing forest road was also coming under submergence for which the amount was earmarked.

5.2.5 Pehsari Dam, Gwalior

The forest land carries miscellaneous forests of IV-b quality having an average density of 0.5. Major tree species are khair, amla, ber etc .The details of the land use under this project are as under:

Table 8: Details of forest area under submergence

S.No.	Component	Area (ha)
1.	Dam area	26
2.	Submergence area	581.110
3.	Area used for canal construction etc	153.650
4.	Miscellaneous	9
Total		769.760

(Source 10: Reports at Gwalior FD)

Under this project no private land and Revenue Land came under Submergence, only forest got submerged.

The details of the forest land coming under submergence of the dam are as under:

Table 9: Details of Full reservoir level (FRL) Level

S.No	At F.R.L.	616 ha
1.	At two meter below F.R.L.	436 ha
2.	At four meter below F.R.L.	390 ha

(Source 11: Reports at Gwalior FD)

No tree felling was permitted in between FRL and Four meters below FRL.

5.2.6 Rampurakhurd Tank, Sehore

There was very little forest involved. The density was 0.2 to 0.4. The forest area under the submergence had moderate vegetation only. Total area falling under submergence was 539.93 ha.

The table shows the details of the land under submergence including the private land along with the forest land.

Table 10: Details of land under the submergence

S.No	Land	Area (ha)

1	Revenue land	38.62
2	Private land	214.74
3	Forest land	
(a)	Actual forest	100.44
(b)	Cultivated land on patta	186.13
	Total	539.93

286.57

(Source 12: Reports at Sehore FD)

In this project both Forest land and private land were coming equally in the submergence area.

5.3 Villages submerged

5.3.1 Sanjay Sagar Wah Project

168 families were affected due to the construction of this dam. Majority of these families had agriculture as main occupation. The submergence involved 1202 ha of private land. Total of 27 villages were to be submerged. Out of these 23 is in Vidisha and 7 is in Bhopal. The villages which were to be under full submergence included: Hanotia, Dunatar, Alampur, Rajpura, Gangapur, Khusmalpura, Thagar, Kanchanpur and Bhairanpur. Partially submerging village was Nusratgarh.

5.3.2 Omkareshwar Multipurpose Project

Any serious effort to deal with the impacts of displacement and to restore peoples' livelihoods begins with the collection of data. People who are not counted at the beginning have little chance of being rehabilitated at the end. According to the Narmada Valley Development Authority (NVDA), the Omkareshwar Project was to affect 3024 families (around 15,120 persons from 30 villages).

These were some of the villages which were to be submerged.

Ekhand, Goal, Goghalgaon, Indhawadi, Kamankheda,Karoli ,Kelwa Buzurg,Paladi Saktapur,Sukwa ,Toki ,Panthiaji.

5.3.3 Rajeev Sagar (Bawanthadi) Irrigation Project

In total ten villages were in the submergence area three of Bhandara and seven of Nagpur .The villages were: Sitekasa, Kamkasur, Susurdoha, Pusada, Chikanpur, Murzakd, Pundkapar, Sitapur, Karozghat and Tangha. Out of these ten villages Sitekasa was proposed to be resettled to Khapa Khurd, Kamkasur to Rampur Hamesha and Susurdoh to Garra Bagheda.

5.3.4 Maksudangarh Tank Project

One village Basilgarh under Tehsil Lateri District Vidisha was coming under submergence completely while the agriculture land of village Aari under the same Tehsil and district was also coming under

submergence partly. 18 families of village Basilgadh were about to get displaced and rehabilitate in nearby village Mawan. For this the consent of villagers were also obtained as per the Rehabilitation Plan.

5.3.5 Pehsari Dam

In this project no village came under submergence.

5.3.6 Rampurakhurd Tank

The private land coming under submergence belongs to Rampurakhurd, Guardia Rao and Narpakhedi villages. Total 109 families of these villages get affected. For the 73 families coming under the forest area submergence (i.e. forest villages) belongs to Hazipura, Neemat, Tappar, Peethapura and Pamakhedi.

5.4 Area to be Irrigated

5.4.1 Sanjay Sagar Wah Project

Total 40 villages i.e. 33 villages of Vidisha and 7 villages of Bhopal district will be benefitted. The annual irrigation expected from this project 17807 ha. The Kharif annual irrigation will be 8409 ha and that of Rabi will be 9398 ha. Because of this irrigation the water level will also rise through which drinking problem will be sorted out.

5.4.2 Omkareshwar Multipurpose Project

The project envisaged to irrigate about 2.83 lakhs hectares annually. The Culturable command area was 1.468 lakhs hectares.

5.4.3 Rajeev Sagar (Bawanthadi) Project

The Culturable command area of this project in Balaghat District in M.P. is 18615 hectare and in Bhandara District in Maharashtra is 17537 hectare. The intensity of irrigation is 158%. The total irrigation in 105 villages under Balaghat district was proposed to be 29412 ha and in 77 villages under Bhandara District was proposed to be 27709 ha.

The table below shows the detailed description of command area in two districts.

Table 11: Details of command area

S.No.		Maharashtra Portion(ha)	Madhya Pradesh Portion(ha)	Total (ha)
I	Gross Command area (G.C.A)	39459	37410	76869
II	Culturable Command Area (C.C.A)	25062	23786	48848
III	Irrigated Command Area(I..C.A)	1753	18615	36152

IV	Annual Irrigation	27708	29412	57120

(Source 13: Reports at Bhandara FD)

Both the states were proposed to have nearly equal gross Command area.

5.4.4 Maksudangarh Tank Project

The project was planned to irrigate 1943 ha of land (Net C.C.A.) with 122.90 % of irrigation intensity in 11 villages of Raghogadh Tehsil, Guna.

5.4.5 Pehsari Dam

This project envisaged irrigation of 33,000 acres under the command of Feeder canal and Sank Swaran Rekha Link canal.

5.4.6 Rampurakhurd Tank

The cultural command area under this project was 3412 ha.

5.5 Electricity to be produced and Drinking water to be supplied

5.5.1Sanjay Sagar Wah Project

This project did not involve generation of electricity. The project may serve for providing drinking water.

5.5.2 Omkareshwar Multipurpose Project

This project envisaged construction of a concrete dam with gated spillway to generate power with an installed capacity of 520MW.

5.5.3 Rajeev Sagar (Bawanthadi) Project

This project did not involve electricity production.

5.5.4 Maksudangarh Tank Project

This project did not involve generation of electricity. This project also served for providing drinking water to nearby villages.

5.5.5 Pehsari Dam

This project did not involve electricity production. The main prupose of this project was to supplement the drinking water requirement of Gwalior town.

5.5.6 Rampurakhurd Tank

This project does not involve generation of electricity. This project did not serve as providing drinking water to nearby villages.

Chapter 6: Status of Compliances

There were various conditionalities which were to be fulfilled under the Forest Clearance. The general conditionalities were:

i. Legal status of forest shall remain unchanged.

ii. Tree plantation to be done on the either side of the canal and foreshore and in the waste land/vacant lands under the control of Irrigation Department.

iii. Water to be supplied free of cost to the Forest Department for raising nursery and irrigation forestry plantations in the command area.

iv. Creation of Environment cell/Reviewing committee (Major Projects).

v. In order that the construction labor and staff while working on the project in the forest area may not cause destruction to the forest area for meeting their fuel wood needs, the User Agency will establish fuel wood depots and will provide the fuel wood to them free of cost or its cost deducted from their salary and wages. Special arrangements for check on hunting and damage to the adjoining forest area done by laborers.

vi. Tree felling will not be permitted between FTL/FRL and four mt below FTL/FRL.

vii. Reclamation/Leveling of Quarry to be done.

viii. Compensatory Afforestation shall be raised and maintained on equivalent non-forest land/double degraded forest land at project cost. The non forest lands identified for this purpose should be handed over to the Forest Department and notified as protected forest before the release of forest land diverted by the orders. For the CA the conditionalities /compliances were governed by the following conditions:

   a. It should be continuous with the existing forest boundary or as much as possible nearer to the existing forest boundary.

   b. There should be no disputes.

   c. It should be free of encroachment.

   d. No cattle grazing should be allowed.

e. It should be on big, manageable block (>10 ha).

f. It should be suitable for afforestation, selected as per keeping in mind the fuel-wood, grazing and other needs of the village people.

6.1 Status of Compliances of approved Conditionalities for the Projects

The general conditionalities of all project covered with their status of compliance is shown in the table below.

Table 12: Status of compliance of Conditionalities of the studied project

Conditions Projects	**Tree felling At FRL and four mt below FRL**	**Provision for facilities Labor**	**Reclamation and leveling of Quarry**
Sanjay Sagar Wah Irrigation Project	Project under construction.	Yes	In construction phase
Omkareshwara Multipurpose Dam	No permanent demarcation	Yes	Yes
Rajeev Sagar Irrigation Project	No permanent demarcation	No	No
Maksudangadh Tank	Not identifiable	No	Yes
Pehsari Dam	No permanent demarcation	Yes	Yes
Rampurakhurd Tank	Not identifiable	Yes	No

(Source 14: pers obs)

It was found that Tree felling at FRL and four mt below FRL was not readily identifiable, because no permanent demarcation was found on the site, if boundary demarcation done in some places it was with stones.

The details of the compliance summary of individual project are given below:

i. Sanjay Sagar Wah irrigation Project

Table 13: Compliances summary of Sanjay Sagar Wah Project

S. No.	Condition	Yes	No	Can't say	Comments
1.	Transfer of non-forest land to Forest Department.	√			Yes the required area of non-land have been transferred and given to forest department.
2.	Declaration of Non-forest land as reserved forest	√			The non forest land given is now under reserved forest category.
3.	Cost of raising and maintaining the Compensatory Afforestation to be given by the user agency.	√			The government has already paid Rs 17.92 Crores as land acquisition and 90 lakhs to the forest department for the plantation.
4.	Above cost deposited by SFD to CAMPA.	√			No documents in this regard were found. But was confirmed by Forest Department.
5.	To construct 4 feet high RCC pillars with forward or backward bearing to demarcate the area			√	The dam construction was still going on but it is proposed to have 4 feet RCC pillars.
6.	Reservoir(1956 ha) to be declared as Reserved		√		The irrigation department do not agree to the declaration of reservoir as reserved.(as stated in year 2004)
7.	Only regulated fishing right			√	As the dam is in its initial phase.
8.	Legal status of forest to be unchanged		√		Since Work is in progress. As soon as the work will finish the announcement of entire submergence area as reserved forest will be initiated.

9.	Rehabilitation should not be done on forest land	√			Resettlement is done on revenue land plus all the facilities e.g. road, electricity, hand pump, school have been provided by the government.
10.	Forest land not to be used for other purpose			√	The forest land is not to be used for other purpose.
11.	CAT Plan implemented or not?	√			The CAT plan was drafted and Check dams, stop dams etc were also made.
12.	Water whether given free of cost for nursery and plantation			√	As the dam is in its initial phase still government people say that water will be provided free of cost.
13.	Native trees species to be planted on the vacant land along the reservoir and canal			√	As the dam is in its initial phase.
14.	Measures taken by user agency to conserve environment and forest		√		No measures have been taken by the user agency in this regard.
15.	No labor camp to be set up in forest area, not in habitation to come up in the forest area	√			The labor are provided with tin made camps along with some self made huts not in the forest area but near the construction site.
16.	Protection of wildlife by user agency		√		There are habitats of birds and butterfly but no measures have been taken by the user agency in this regards.
17.	Steps taken to minimize biotic pressure over adjoining / nearby forest		√		No such steps were taken.
18.	Whether local people involved in CAT or not for monitoring and aftercare		√		Local people were not involved in any of the plans and monitoring schedule.
19.	Free homestead land of 0.2	√			The plot of size 60/90 is proposed

	ha to all the affected families				to be given to all affected families. The sites have already been selected near Dangarwada and Laadhpur village.
20.	Carrying capacity of the villages where displaced are to be settled	√			They will be settled in new areas.
21.	Whether scientific study of flora, fauna, catchment conservation, wildlife habitats done or not		√		No such study was conducted.
22.	Catchment Area Development whether includes impact on quality of surface and ground water			√	No documents in this regard were found.
23.	Condition of water logging		√		In dams water logging does exist in the downstream for initial 1-2 years but it is not the case with this dam as the soil is not water logging. Also if it exists then there will be seepage due to design.

(Source 15: pers obs)

Ii .Omkareshwar Multipurpose Project

Table 14: Status of compliances

S.No.	Conditionalities	Yes	NO
1.	Legal status of forest shall remain unchanged	√	
2.	Compensatory Afforestation shall be raised and maintained over degraded forest land double in extent at the project cost (as per the revised cost structure**)** by the State Forest Department. The maintenance of the	√	

	plantation shall be done for next 7 years at the project cost.		
3.	The catchment area treatment works shall be followed and executed as per the plan under the supervision of the State FD.	√	
4.	The State Government shall create a **special fund** out of the proceeds recovered, from harvesting of forest produce in the project area within a period of six months. The compliance in this regard shall be reported by the State Government to the Regional Office, Bhopal. This fund shall be utilized for the purpose of regeneration, re-afforestation of degraded forest and forest development.		Cant Say
5.	No forest land shall be utilized for rehabilitation of project affected persons. Displaced people shall be resettled by the State Govt. immediately on non-forest lands as per the Resettlement and Rehabilitation Plan to avoid any kind of encroachment on forest lands.	√	
6.	Demarcations of the area will be done on the ground at project cost using 4 feet high RCC pillars. The RCC pillars should bear serial numbers, forward and back bearings and distance between adjacent pillars.		√
7.	Trees shall be felled by the State FD following the proper silvicultural procedures and an inventory of timber and produce shall be √maintained by the State FD.		Cant Say

8.	Reservoir so created shall be declared as "Reserved Forest" under Indian Forest Act, 1927 and regulated fishing rights shall be allowed.		√
9.	Water will be provided free of cost to the FD for raising nursery/plantation in nearby areas.		Forest Department did not ask for it.
10.	No labor camps shall be established on the Forest Land. Laborers shall be provided free supply of fire-woods or other sources of energy by the project authorities. In case of forest wood, it shall be procured from MP Forest Development Corporation.		Cant say
11.	Environment clearances shall be obtained by the user agency.	√	
12.	The forest land shall not be used for any other purpose other than that specified in the proposal.	√	
13.	Any other condition may be impose from time to time in the interest of conservation, protection and development of forests.	√	

(Source 16: pers obs)

iii. Rajeev Sagar (Bawanthadi) Project

Table 15: Status of Compliances

S.No	Condition for Approval	Position of Compliance(As cited in the documents Dated 28.04.89)	Comments/observations
1	The legal status of the forest land will remain unchanged.		Done
2.	Canal system will have a	Tree plantation has been done	Canal plantation could not be

	length of 50 kms in Maharashtra and 78 kms in M.P. Canal sites will provide an area of about 78 ha for afforestation. This should be made available to the State forest dept. for raising plantation.	by Irrigation Deptt during 1980-81. Plantation in other areas to be done by Forest Deptt after completion of canal.	observed .It was also proposed that canal plantation would be done through social forestry.
3.	Surplus irrigation potential is around 5 Mm^3. This water should be made available to the Forest Deptt of M.P. and Maharashtra for raising irrigated plantation.	Condition accepted by both states.	Project yet not completed. Can't Say.
4.	No Reservoir/Dam land should be utilized for any purpose including summer agriculture etc.	Agreed by both the states.	Can't Say.
5.	The dam will result in creation of a huge reservoir which should be used as sanctuary tank by the Forest Deptt of Maharashtra and M.P.	Fisherman affected by the project should allowed fishing.	Fishing will be allowed.
6.	The areas which will not submerge should be handed over to the Forest Deptt so that it may not form foci for encroachment in forest.	Pocketed areas submitted to collector. The acquisition proposals are under progress.	Not Done.
7.	Rehabilitation plan and CAT plan should be got approved from the environment angle.	R & R plan submitted by S.E., N.I.P.C, Nagpur. Action plan for CAT Plan are to be prepared by M.P. Govt with help from Maharashtra Govt.	Both plans are approved and submitted.
8.	Tree felling will not be permitted between F.R.L.	Condition agreed by both the states. F.R.L. & F.R.L. below four mt stones are fixed by M.P.Project authority on periphery of dam.	Cannot be monitored as no permanent demarcation was observed.
9.	Compensatory plantation	In Maharashtra compensatory	Done. Cannot say anything

	should be raised on equivalent non-forest area at the cost of the project. The non-forest lands identified for this purpose should be handed over to the forest department and notified as protected forests before the release of forest lands being diverted by these orders.	afforestation have already been completed on 2448 ha. These lands have been notified as protected forest land and handed over to Forest Deptt. In M.P. too works of C.A. have been completed.	about Declaration as protected forest, since documents in relation to it were found.
10.	Tree plantation to be done on either side of canal road and foreshore of the reservoir and in the waste land/vacant lands under the control of the irrigation department .	Plantation on R.B. Main canal and Branch I and II have been done. Plantation on rest of canal system will be done after the completion of canal work.	Plantation on RB main canal not seen. However the plantation is proposed and will be done after the completion of construction works.
11.	Water to be supplied free of cost to the Forest Deptt. For raising nursery and irrigation of forestry plantation in the command area.	To be fulfilled after filling of the reservoir.	No land for compensatory afforestation comes under command area so water cannot be provided from the canal.
12.	User agency will establish fuel depot and will provide fuel woods to the labor free of costs/or cost deducted from their salary or wages.	Special clause introduced in the condition of contract. Supply depot already working in the vicinity of the project.	Fuel depots have been established by User agency for the labor force.

(Source 17: pers obs)

iv. Maksudangarh Tank

Table 16: Compliance Status of Maksudangarh Irrigation project

S.No.	**Conditionalities**	**Observation/Comments**
Forests and Environment		
1.	The legal status of forest land will remain unchanged	Done.
2.	Compensatory afforestation to be raised over equivalent non-forest land which will be notified as protected forest under the Irrigation Forest Act.	The compensatory afforestation was done but not according to the proposal.
3.	Catchment Area Treatment to be done as per the	Done.

	plan prepared at the project cost.	
4.	Tree planting to be done on the either side of the canal, foreshore of the reservoir and the waste land/vacant lands under the control of Irrigation Department.	There was no tree plantation when we visited the canal and sub canals. However few have the views that user agency did some plantation on these sides BUT according to our observation whatever few trees were there, they all were naturally grown.
5.	The State Government should take immediate action for transfer and mutation of non-forest land in favor of the State Forest Department	Done but the land was under encroachment.
6.	To restrict the minimum use of forest area, suitable construction material i.e. quarry soil for earthwork of bund are proposed in the submergence area.	Can't say.
7.	Special monitoring committee to be constituted with experts from various fields' ecology, watershed, soil, sociology etc for preparing and implementing EMP (Environment Action Plan).	Not done.
8.	Restoration of construction area, leveling, and filling of borrow pits.	Yes these restoration were done, the areas were leveled.
9.	Special arrangement to be made for restricting the entry of the laborers to the nearby forest area to avoid damage to vegetation cover.	No such special arrangements have been made in reference with the compliance. The laborers had access to the nearby forest and they might be using these forest woods thereby putting pressure on forests and disturbing the wildlife.
For selecting land for CA		
10.	It should be as continuous with the existing forest boundaries or as near as possible.	Yes, the compensatory afforestation done was in continuance with the existing forest.
11.	There should be no disputes.	There were no such disputes however on the land where compensatory afforestation were proposed, that was encroached but

		people left the place when government asked them to do so without creating any disputes.
12.	There should be no encroachment.	There were encroachments.
13.	It should not be a regular cattle grazing ground. (As far as possible).	It was a regular cattle grazing ground as area itself was encroached thus the encroachers may be allowing their cattle to graze on these land thereby creating pressure and disturbing the soil stratum.
14.	It should be suitable for afforestation, selected as per keeping in mind the fuel-wood, grazing and other needs of the village people.	No, this was not kept in mind.
15.	It should be big, manageable block not less than 10 ha.	Yes, all the compensatory afforestation areas were having size more than 10 ha.
Others		
16.	Fuel arrangements for laborers at work.	No such arrangement was made. The laborers used to bring fuel woods from nearby forest.
17.	To prevent spread of communicable diseases screening of work force at the project and health centre to be made.	Not Done.
Rehabilitation and Resettlement		
18.	Resettlement cell to be set up for implementation and monitoring, consultation mechanism consulting with affected people and state government.	No such resettlement cell was set up for the given purpose.
19.	Homestead land i.e. plots having size 90X60 fts was given.	Yes plots of given size were given.
20.	The resettlement site was proposed to have roads, school building, water, electricity, Panchayat Bhavan etc.	The site has (Mahawan) roads, school, water facility, electricity facility and Panchayat Bhavan. The medical and education facility was at Lateri at distance of 3 km from Mahawan.

21.	It was proposed to give compensation as Land to Land. If anyone refused to take land then compensation would have been given in monetary terms.	The compensation was given @ Rs 6000 per bigha 14 years before the construction of dams started. Compensation only for agricultural land were given.
22.	For landless families adequate ex-gratia will be given which should be kept in fixed deposit to ensure income to them.	Yes it was given.
23.	The landowners would be allowed to raise crops in the submerged area when tank will be dry.	Yes these people had access to raise crops in the submerged area during summers. They usually grow onion, moong on these lands.
24.	The landless families were also given subsistence allowance at the rate of Rs 150 per month for 18 months and for 6 months to the landowners.	Yes such subsistence was given to these families.
25.	Adequate training facilities to make the people equipped for suitable jobs.	Yes training facility was given. People from Aari village were also given training facility. Entire Aari village was aware of such training facility BUT many village people themselves did not went for training because of their lack of willingness plus they were already occupied with their agricultural activities.
26.	Oustees will get priority in getting suitable jobs on the project.	No such activity was conducted. Most of the jobs related to the dam activity were given to laborers hired from other places by the Contractors.

(Source 18: pers obs)

v. Pehsari Dam

Table 17: Status of Compliances of Pehsari Dam

S.No.	Condition for Approval	Comments and observation
1.	Legal status of forest land to remain unchanged.	Done.
2.	Tree felling will not be permitted between FTL/FRL and 2/4 mt below FRL/FTL.	Can't Say. Since no permanent demarcation boundary was there it was not possible to identify the area.
3.	Compensatory plantations to be raised on equivalent non-forest area at the cost of the project. The non-forest land identified for this purpose should be handed over to Forest Department and notified as protected forests before the release of forest lands being diverted by these orders. Note: per ha cost for the CA during the year 1986 was 10000 per ha.	Done. The declaration of area as protected forest was not done.
4.	The afforestation cost was paid by the user agency	Yes. Rs 769760 were being paid.
5.	The land on which afforestation was to be done to be declared as protected/reserve forest	Not Done. The procedure was in initial phase.
6.	Tree planting to be done on either side of the canal and foreshore of the reservoir and in the waste land/vacant lands under the control of irrigation Deptt.	Not Done.
7.	Water to be supplied free of cost to the Forest Deptt. for raising nursery and irrigation forestry plantations in the command area.	FD had not asked for it.
8.	In order that the construction labor and staff while working on the project in the forest area may not cause destruction to the forest area for meeting their fuel-wood needs, the	Can't Say, as construction of project was over.

	user agency will establish fuel depots, and will provide the fuel wood to them free of cost or its cost deducted from their salary and wages.	
9.	Whether any committee has been formed for monitoring of the action on condition stipulated	Not Done.

(Source 19: pers obs)

vi. Rampurkhurd Tank

Table 18: Compliance Status of Rampurakhurd Tank

S.No.	Conditionalities	Observation and comments
1.	Legal status of forest will remain unchanged.	Done.
2.	Tree felling will not be permitted between FTL and 2 meter below FTL.	Can't Say, as no permanent boundary Demarcation was present so area was not identifiable.
3.	Compensatory plantation should be raised on equivalent non-forest area at the cost of the project. The non forest land identified for this purpose should be handed over to the Forest Department and notified as Protected forests before the release of forest lands being diverted by these orders.	Not Done.
4.	Tree planting to be done on either side of the canal, road, and foreshore of the reservoir and in wasteland /vacant lands under the control of the irrigation department.	Not Done.
5.	Water to be supplied free of cost to the forest department for raising nursery and irrigation of	FD had not asked for it.

	forestry plantation in the command area.	
6.	In order that the construction labor and staffs while working on the project in the forest area may not cause destruction to the forest area for meeting their fuel wood needs, the user agency will establish fuel wood depots, and will provide fuel wood to them free of cost.	Can't Say, As project was already completed.

(Source 20: pers obs)

6.2 Some major Conditionalities

6.2.1 Compensatory Afforestation

The table shows the details of the area which were given for CA for the Projects.

Table 19: Details of CA site

Project	Status	Total Area (ha)
Sanjay Sagar Wah Irrigation Project	Done	304
Omkareshwara Multipurpose Dam	Done	11660
Rajeev Sagar Irrigation Project	Done	2448.10
Maksudangadh Tank	Done	179.445
Pehsari Dam	Done	769.76
Rampurakhurd Tank	Not Done	-

(Source 21: pers obs)

In five of the projects equivalent non-forest land was given for CA, in Omkareshwar Dam due to non availability of non-forest land, CA was to be done on Double degraded forest land.

i. Sanjay Sagar Wah Project

No details regarding CA were found for this project due to various reasons. The sites which were visited were on the basis of the Information given by the Forest Guard of Shamshabad, Vidisha.

ii. Omkareshwar Multipurpose Project

Non-Forest land was not identified. A scheme for raising plantation in degraded forest land over an extent of 11660 hectare at accost of Rs21.98 Crores was prepared. The degraded forest areas proposed for plantation were situated in Khargone District. Afforestation was to be done by Narmada Valley development Authority, for which two Forest divisions were created exclusively. Since the available non-forest land in the project areas were already set apart for CA against Narmada Sagar project, there was no more non-forest area available for Omkareshwar Project since the Project impact area overlap for both the projects. No details regarding where were the CA sites actually given were got.

iii. Rajeev Sagar (Bawanthadi)Project

For this project total land for CA was identified to be 699.710 ha which was on Zudupi Jungle. The plan was made for 10 years. It was planned to raise 2500plants/ha in areas having heavy rainfall. Measures for soil conservation were also planned to be carried out. In the CA sites it was proposed to make fire lines and keep watch guards. Few species which were planted in CA were Shivan, Sisoo, Siras, Arjun, Bamboo, Baheda. Villages identified for CA were :

a) Gondia(M.P.) – Kharra, Tikayatpur, Murdala, Wadad and Gangazari.
b) Tiroda – Gondmohadi, Rustampur, Pindkepar, Sukadi, Vihiriya, Indorabuj, Sarandi, Yedmakot, Jamuniya, Manora, Paldongari, Garada and Arjuni.
c) Nagpur – Goreghat and Ambajhari

iv. Maksudangarh Tank Project

To compensate for the loss of forest, CA over equivalent non forest land was identified. Afforestation progress was to be executed by Territorial Forest Division, Vidisha. It was also proposed that the Afforestation area were demarcated one year in advance and was protected by cattle proof trench or wall.

The table shows the action plan which was made in regard to be implemented for Maksudangarh Project.

Table 20: Action plan for CA for Maksudangarh project

1	Project for which land is needed.	Maksudangarh Irrigation tank Project
2	Total forest land needed	129.53 ha
3	Non forest land identified for CA	179. ha revenue wasted land.
4	Location of non forest land	Tehsil Lateri, Dist. Vidisha
5	Plan period	5 years

6	Annual afforestation plan	50 ha
7	Capital expenditure	Rs 3 lakhs
8	Total expenditure	Rs 30 lakhs

(Source 22: pers obs)

The land given was revenue wasted land, and the quality of the soil was very poor.

v. Pehsari Dam

Total of 769.760 ha non-forest land was given for CA in Gwalior division. The plantation was done in 1990, 1991 and 1992, as written in the document. Amount paid by the user agency for CA was nearly 77 lakhs. It was mentioned in the document that out of the total land given for CA plantation was done on755.658 ha. Details of plant species planted were not available. The areas given for CA were situated in: Ramoa(35.6 ha), Singarpura(58.99 ha), Bastari(23.1 ha), Singhpur(13.7 ha), Chandobakhurd(11.7 ha), Santua(12.3 ha), Mohana(41.007 ha),Sikrawali(54.25 ha), Jakhoda(119.65 ha), Bhagwanpur(62.015 ha), Sirsu(95.63 ha) and Barhaipura(241.5 ha).

vi. Rampurakhurd Tank

In lieu of forest covered area 100.44 ha, 117.316 ha was proposed in village Bhoura, tehsil Ashta. This site was also adjacent to Bhoura reserve forest. For forest land under cultivation on pattas 184.625 ha was proposed in village Khandopur and Amipur. The site was inspected by revenue, irrigation and forest official and was found suitable.

6.2.2 Catchment Area Treatment plan

This is the most important conditionality which need to be done effectively, since it is directly related to the storing capacity of the reservoir. Various engineering and biological measures are adopted for the Catchment area treatment. These measures are contour bunding, terracing, paddy bunding, gully plugging, inclusion of vegetable barriers, horticultural operation, farm forestry, afforestation etc. these measures help in integrated development of catchment area and also increase life of Dam.

i. Sanjay Sagar Wah Project

The catchment area for this project was 562.5 Sq Km. The break use of catchment area were:

i. Sapan river 117.20 Sq Km
ii. Banjari River 100.30 Sq Km
iii. Wah River 344.50 Sq Km

In order to control the silting of the reservoir, the provision for treatment of catchment was made. For CAT plan Rs 636.71 lakhs was given on 1st January 2010. It was mentioned in the documents that given below treatment have been taken.

Table 21: Treatment of catchment area

1.	Plantation	2500 ha
2.	Rehabilitation of Degraded Forest	2966 ha
3.	Fodder Development	1000 ha

(Source 23: CAT Plan of Sanjay sagar project

Various CAT measures were used like contour trenching, stone bunding, check dams, stop dams, gully plugging etc. the completion of CAT is targeted to be 7 years. It was mentioned that the Forest Department would have to do the work for CAT in forest area and for non forest area it was to be done by Water Resource Department

ii. Omkareshwar Multipurpose Project

Total drainage area was 6488 km^2 out of which free drainage area was 3238 km^2.The area was divided into ten sub –watersheds. On the basis of silt yield index the extent of watershed areas coming under different priority were as shown below.

a) High Priority – 46875 ha
b) Medium Priority – 165625 ha
c) Low Priority – 130000 ha

Total - 342500 ha

The scheme envisaged intensive treatment of actual available forest land in the high priority areas. Total forest area available in these high priority areas was 16825 ha. Out of this 10404 ha Area was under treatment against Narmada Sagar Project. Also, 406 ha were proposed to go under submergence of Omkareshwar project and areas under forest villages were 502 ha. After deducting these areas the net area available for treatment was 5513 ha. It was planned to raise plantations, carry out soil conservation measures, pasture development and other measures for preventing silting. The total financial outlay was estimated at Rs7.985 Crores which included maintenance of the measures taken. The entire scheme was planned to last for 11 years.

iii. Rajeev Sagar (Bawanthadi)Project

The catchment area up to the dam site was 1365 square km .And out of that it was spread over Balaghat district 29.12km^2 and Seoni district 913.88 km at Madhya Pradesh. In Maharashtra,564.12 square km in Nagpur District and 57.88 square km in Bhandara district. The upper part of the catchment was mostly in M.P. and lower part in Maharashtra. The priority delineation of the catchment area was done by all India Soil and land use Survey, GOI through its regional center at Nagpur. Various measures were mentioned in the CAT plan which included Biological as well as Engineering Measures.

iv. Maksudangarh Tank Project

The catchment area was 65.63 sq kms. The land under catchment area was hilly track, undulating, flat and sloppy zones. The catchment area of Nalla was 25.35 sq miles at the dam site. The soil of the land under catchment area was Hard soil and Black cotton soil mixed with boulders.

The Land Use of Catchment area was:

Table 22: Land Use of Catchment area

S.No	Category of land in catchment	Total Area in ha	Critical Area proposed for treatment in ha	Proposed treatment
1.	Submergence	213.72		
2.	Culturable land	1729.00	615.00	Field bunding, stepping, planting of grass, shrubs etc.
3.	Culturable fallow land	121.00		
4.	Barren land	227.00		
5.	Forest land	3260.28	923.00	Gully, plugging, check dams, turfing, staggered, trenching and plantation of fast growing indigenous plants.
6.	Rocky area	884.00		
7.	Other land	131.00		
	Total	6566.00	1538.00	

(Source 24: CAT Plan of Maksudangadh)

The treatment for prevention of land erosion, being necessary, included checking by the construction of check-dams, stop dams, trenches, staggered and suitable fast growing indigenous plants.

The villages under the catchment area treatment plan were:

a. Mohanpur,
b. Nainwas Bhulnipura
c. Aligant
d. Kalyanpur
e. Isarwas
f. Nayanagar
g. Rampur
h. Kokangarh
i. Arepani
j. Sojankhera
k. Bhatoli

v. Pehsari Dam

No CAT plan could be got from the concerned office.

vi. **Rampurakhurd Tank**

Catchment area of Rampurakhurd tank was 5376 ha out of which 539.93 ha fall within FRL contour. 4604 ha was forest area and 232.07 ha was the revenue land. The revenue land comprises of gentle slopes and no soil conservation arrangement was required. Out of 4604 ha of forest area, the critical area of 841.47 ha required anti-erosion treatment. The C.A.T. plan comprised of providing check dam, gully plugging, trenching, step guard trenching, plantation, and contour bunding. In all 18 big and 24 small check dams along with 28.219 Km long trenching were proposed.

6.2.3 Rehabilitation and Resettlement

i. Sanjay Sagar Wah Project

The dam was going to affect 168 families. Submergence involved 1202 ha of private land. Also majority of people had agriculture as their main occupation. The landless laborers who were going to be affected were expected to be provided with jobs in the project. The resettlement was given in revenue land and all the facility were to be provided by the User Agency.

ii. Omkareshwar Multipurpose Project

Any serious effort to deal with the impacts of displacement and to restore peoples' livelihoods begins with the collection of data. People who are not counted at the beginning have little chance of being rehabilitated at the end. According to the Narmada Valley Development Authority (NVDA), the Omkareshwar Project will affect 3024 families (around 15,120 persons from 30 villages).

These were some of the villages which were submerged - Ekhand ,Goal ,Goghalgaon, Indhawadi, Kamankheda,Karoli ,Kelwa Buzurg,Paladi Saktapur,Sukwa ,Toki ,Panthiaji.

The major provisions in the Rehabilitation Policy for the Oustees of the Narmada Projects were:

a) Every land-owning family that will lose more than 25% of its land is entitled to land for- land compensation, with a minimum of 5 and a maximum of 20 acres to be provided.
b) Long-term encroachers will be treated on par with land-owners.
c) Villages should be resettled as communities.
d) Each person whose land is being acquired for purposes of the project is considered a project-affected person.
e) If an oustee family expressly wishes to receive cash in lieu of land, it must submit an application to this effect to the Land Acquisition Officer. If an oustee family belongs to the Scheduled Tribes (Adivasi) and submits such an application, the District Collector must verify that cash compensation will not adversely affect the interests of the family.
f) The project authorities are responsible for the transportation of families from the area of submergence to the relocation sites and the entire expenditure for transportation will be met by the project. Civic amenities (electricity, school, temple, dispensary, seed store etc.) are to be provided at the new site.

iii. Rajeev Sagar (Bawanthadi) Project

Due to submergence of Rajiv Sagar (Bawanthadi) project total 11 villages were affected 10 from Maharashtra and one from Madhya Pradesh state. Out of this only land affected in 3 villages (2 in Maharashtra and 1 village Kharlangi in M.P.) did not require rehabilitation and resettlement. The Rehabilitation and Resettlement of the fully effected 8 No. village of Maharashtra State work were being done by Irrigation Department of Maharashtra State. As per programme this work was to be completed up to March-2010.The provision for rehabilitation of the population affected by this project has been made in the estimate as per Maharashtra Resettlement Act 1989. Rehabilitation of 10 villages in Maharashtra state out of which 5 villages viz Pusada, Murzad, Chikanapur, Pindkapar and Sitepartola were in Nagpur District and 3 villages viz Sitekasa, Susurdoh and Kamkasur were in Bhandara district. Remaining 2 villages were Karajghat and Tangla. Sitekasa in Tumsar Tehsil situated on dam seat was rehabilitated at village Khapa Khurd in 1983. All the civic amenities had been provided through Zila Parishad ,

Bhandara. The remaining families belonging to remaining 7 villages were proposed to be rehabilited as per the provision laid down in the Maharashtra State "Resettlement of project displaced persons Act 1976".

The table shows the details which were mentioned in one of the Environment Cell meetings held at Nagpur.

Table 23: Details of Rehabilitation

S.No.	Affected Villages	Proposed village for resettlement	Present status of resettlement
Dist Bhandara			
1	Sitekesa	Khapa Khurd	Civic amenities have been provided
2	Susurdoh	Garra bagheda	Work of civic amenities nearly completed
3	Kamkasur	Rampur-Hamesha	Work of civic amenities nearly completed
Dist Nagpur			
4	Pusada	Chichda	Work of civic amenities nearly completed
5	Murzad	Pindkepar (at higher level)	Work of civic amenities nearly completed
6	Chikanapur	Tangla	Work of civic amenities nearly completed
7	Pindkepar	Pindkepar (at higher level)	Work of civic amenities at final stage
8	Sitepartola	Sitepartola (only 2 housed are affected)	Work of civic amenities not required

(Source 25: pers obs)

Most of the rehabilitation sites were very dry and no vegetation was found near to the sites.

iv. Maksudangarh Tank Project

Only one village called Basilgarh having a population of 153 was under submergence. Provision of Rs 43.49 lakhs was made on this account which included rehabilitation grant to 160 families @ 150/- PM for 18 months along with grant aid towards transportation, dismantling and re-erecting of dwellings. It was also decided to made provisions to provide primary school, Children Park, seed store well, internal roads, electricity, conservancy, playground, platform, hand pump, community hall etc.

a. Resettlement and Rehabilitation Plan

One village Basilgarh under Tehsil Lateri District Vidisha was coming under submergence completely while the agriculture land of village Aari under the same Tehsil and district was also coming under submergence partly. The village families were shifted to the village Mahawan.

It has been mentioned in the project reports that the consent of the villagers affected was to be obtained as per the rehabilitation plan, but discussion with the affected families showed that no such consent was taken from them .However no conclusion could be made, since it may be the case that some of the people of the village might have been consulted .But this was sure that consent of the whole village was not taken.

Provision for land for land was to be made to the cultivators coming under submergence as per the norms of the state Government if the suitable Government land was available in the district. Otherwise ,it was proposed to give a choice to the cultivators to accept the compensation ,but however in case they do not agree to the above the cultivators were to be given a choice to purchase more or less similar quality of land and the difference in purchase cost minus payable compensation was to be borne /paid by the Government. However no such condition seemed to have been followed. None of the affected person has either got any land as per the provision or were they given any choice. The agriculture land which was submerged was very fertile, now the people are left with not even poor quality land. The livelihood which was dependent on, agriculture has now changed to labor work and the economic condition of the people has degraded.

b. Resettlement

The village under submergence because of the construction of this tank was Basilgarh having an area 213.7 ha including the agricultural land of Aari village. Resettlement was done at Mahawan. Plots having size 90X60 fts was given. The resettlement site was proposed to have roads, school building, water, electricity, Panchayat Bhavan etc. The medical and education facility was at Lateri at distance of 3 km from this village. It was proposed to give compensation as Land to Land. If anyone refused to take land then compensation would have been given in monetary terms. And if person purchases land then the extra cost will be bear by the Government. The landowners would be allowed to raise crops in the submerged area when tank will be dry. The landless families were also given subsistence allowance at the rate of Rs 150 per month for 18 months and for 6 months to the landowners. Oustees will get priority in getting suitable jobs on the project

v. Pehsari Dam

No village came under submergence. Therefore no Rehabilitation and Resettlement was required**.**

vi. Rampurakhurd Tank

R & R plan was prepared in 1989. Resettlement and rehabilitation plan has been prepared for affected families. Total area coming under submergence belongs to Rampurakhurd, Guradia Rao and Narpakhedi villages. This land has already been acquired and payment was also made. Total 109 families have received payment of their land. The land for resettlement was proposed in village Narpakhedi at a distance of 2 Kms from submergence. 8.10 ha was proposed for this purpose. 182 number of plot with basic amenities like school, drinking water, playground, community hall and roads were proposed.

Chapter 7: Impact on forest and Wildlife

Environmental Impact Assessments (EIAs) for large dam projects have been routine administrative procedure in India since the late 1970's. In 1985, the Ministry of Environment and Forests issued its "Guidelines for Environmental Assessment of River Valley Projects", which were updated in 1989 and specified the various studies that must be carried out under an EIA. Furthermore in 1994, the Ministry of Environment and Forests issued a notification under the *Environmental Protection Act*, making EIAs a legal requirement for large dams.

These projects cause great harm to the intact natural forest areas in their vicinity. The dam reservoir submerges huge areas of forest land which also includes rich forest bank vegetation and disturbs the river side habitats of many wild animals. The project impacts, however, go far beyond the the forest area that usually gets drowned in the reservoir.

Generally the forest which get submerges is already having heavy dependence of the local population for forest resources and the project increases the pressure on the remaining forest areas. And thus there is always a chance that as a result, these forests will get drastically altered.

Another major environmental concern is the issue of water-logging. This has grave implications for the environment, but also for the economics of the project, as water-logging raises the salinity of the soils, destroys natural vegetation, reduces agricultural yields and damages buildings and roads. Despite popular belief that the major environmental impacts of dams are upstream, the downstream adverse impacts of dams are often even greater.

One of the adverse downstream impacts of large dams is a significant increase in river bank erosion, especially in the area immediately below the dam as silt deposits are held back, flow patterns change and sudden releases of water create flooding conditions. The erosion and potential collapse of the river banks poses a serious problem for the town of Omkareshwar and will endanger the long-term stability of many of its temples, which are situated directly on the perimeter of the island.

In the Omkareshwar project the now submerged area used to have dry deciduous teak forests which harbored nilgai, spotted deer, leopards, tigers, sloth bears, wild boars and many other large mammals as well as around 130 species of birds .According to the Wildlife Institute of India, this was one of the last pristine stretches of riparian forest along the Narmada River.

There may have been some kind of Environmental Management Plan for Omkareshwar, and NHDC claims that this covers „most of the requirements of an EIA". However, the Environment Ministry's „Guidelines for Environmental Assessment of River Valley Projects" specify that there must be both an Environmental Impact Assessment and an Environmental Management Plan. We were not able to obtain a

legible copy of this plan from NHDC, but it is, in any case, hard to see how an appropriate Environmental Management Plan could have been developed without the information that would be contained in a full EIA.

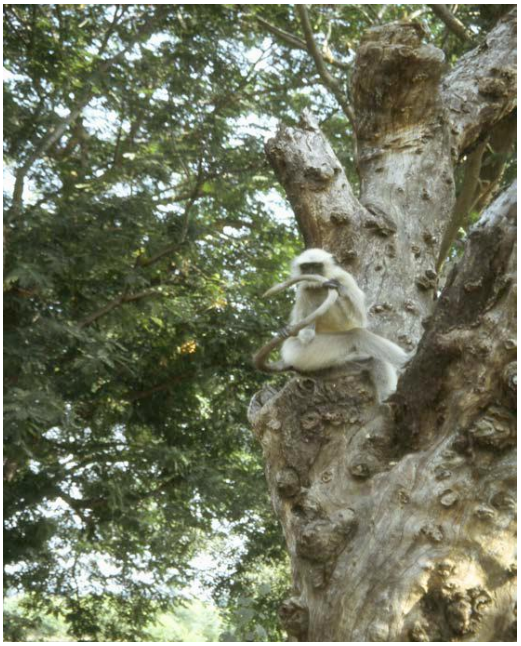


Figure 1: Langur on the banks of the Narmada River

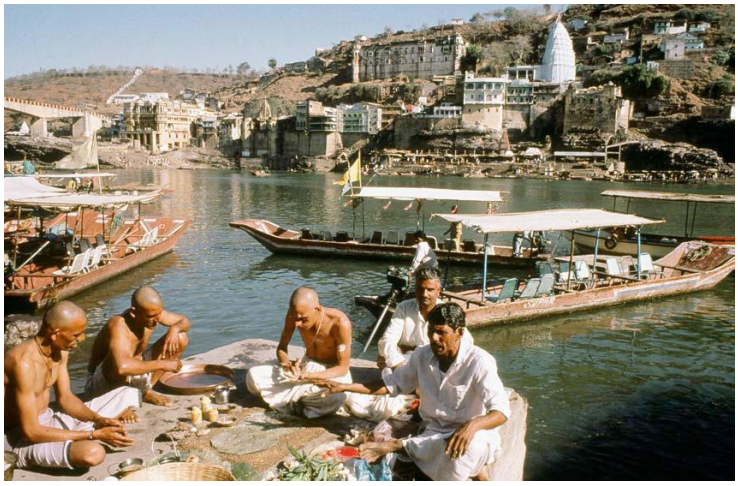


Figure 2: The town of Omkareswar on Mandhata Island

Chapter 8: Observations and Key Findings

Major findings of the projects is given below in detail.

8.1. Sanjay Sagar Wah Irrigation Project

8.1.1 Compensatory Afforestation

The site of Compensatory Afforestation we visited was at Vidisha itself. The condition was good there with fences all around. Also the survival rate of trees was also good. Mainly Teak plantation was found.

Figure 3: CA at VIDISHA(teak plantation)

8.1.2 Catchments Area Treatment Plan

CAT measures like check dams and stop dams was made which were in good condition.

8.1.3 Canals

One of the major conditionality under canal is to do the canal plantation including plantation of trees on side of reservoir, foreshore. However no canal plantation was seen on the visited site. Not even we were able to see any natural plantation.

Figure 4: Canal site at Vidisha

8.1.4 Resettlement and Rehabilitation

168 families were to be affected due to the construction of this dam. Majority of these families had agriculture as main occupation. Total of 27 villages were proposed to be submerged. Out of these 23 were in Vidisha and seven were in Bhopal. The villages which will be under full submergence include Hanotia, Dunatar, Alampur, Rajpura, Gangapur, Khusmalpura, Thagar, Kanchanpur and Bhairanpur. Partially submerging village will be Nusratgarh.

The Resettlement was proposed in Laadhpur. We did visit the site where construction was going on. The schools and medical facilities have been provided.

We also made visit to Alampur village. Here the people were resettled years ago due to the construction of Halali Dam. So the village people were reluctant to move to another place. Also they were of the opinion that the compensation given to them was very less. Also they do not want land for land to compensate for their lost agriculture land.

8.1.5 Specific Observation:

i. Alampur should be reconsiderd with respect to the compensation. Also the affected family of all the villages should be given appropriate compensation and facility.

ii. Provision of Labour facility: As the construction work was going on we were able to visit the labor camps which were present in the dam area. The fuelwoods were also provided to them from the user agency called, Nagarjuna Construction Company. No forest land was acquired by the laborers so there was no as such impact on forest.

iii. Reclamation of quarry- As the dam was under construction so reclamation of quarry was not done.

8.2. Omkareshwar Dam

8.2.1 Compensatory Afforestation

The Compensatory Afforestation condition for Omkareshwar was very poor. The survival rate was very bad. There was a facility for irrigation in the form of water tank. No signboard was found at the place.

Figure 5: Compensatory afforestation site at Omkareshwar (Bamboo.5 year old)

8.2.2 Catchments Area treatment Plan

The catchments area treatment at Omkareshwar includes check dams which were present in series. These were managed properly

Figure 6: Check Dam at Omkareshwar

8.2.3 Canal Plantation

There was no canal plantation on the canal side neither on the reservoir and foreshore side.

Figure 7: Canals at Omkareshwar

8.2.4 Resettlement and Rehabilitation

The people were Rehabilitated too far. They were not given land for land .Most of them possessed land ,but after rehabilitation they were left with nothing. Facilities like roads, electricity water was provided. But no healthcare center was there.

8.2.5 Specific Observation

i. Provision of labor camps on the Dam Site: Specific provisions were made for the laborers.

ii. Reclamation of Quarries- Proper disposal of quarry was done.

8.3 Rajeev Sagar (Bawanthadi) Project

8.3.1 Compensatory Afforestation

The site visited by us was at Nagpur. The survival rate of plants was good. Trees like Teak, Saja, Palash were grown. Also the site was near to a water body so there was no problem of irrigation.

Figure 8: Compensatory plantation at Nagpur

8.3.2 Catchments Area treatment Plan

No catchment area treatment measures have been taken.

8.3.3 Canal Plantation

Like others no plantation was seen on the canal and reservoir sides not even on the foreshore.

Figure 9: Canal plantation at Bawanthadi

8.3.4 Resettlement and Rehabilitation

In total eleven villages were affected, ten from Maharashtra and one from Madhya Pradesh state. Out of this only land affected in three villages (two in Maharashtra and one village Kharlangi in M.P.) does not require rehabilitation and resettlement.

Rehabilitation of ten villages in Maharashtra state out of which five villages viz Pusada, Murzad, Chikanapur, Pindkapar and Sitepartola are in Nagpur District and three villages viz Sitekasa, Susurdoh and Kamkasur are in Bhandara district. Remaining two villages viz Karajghat and Tangla. Sitekasa in Tumsar Tehsil situated on dam seat has been rehabilitated at village Khapa Khurd in 1983. All the civic amenities have been provided through zila Parishad Bhandara. The remaining families belonging to remaining seven villages are proposed to be rehabilited as per the provision laid down in the Maharashtra State “Resettlement of project displaced persons Act 1976”.

We were able to visit Khapa Khurd and interacted with villagers.

Figure 10: R & R for Bawanthadi Project

8.3.5 Specific Observation

i. Provision of labor camps on the Dam site: labor camps were set up in the Forest area only violating the conditionality and thereby increasing pressure on nearby forests.

Figure 11: labor camps on forest land

ii. Reclamation of Quarries- proper disposal of quarry was not done. The quarries were lying as it is near the dam site.

Figure 12: No quarry disposal being done

8.4 Maksudangarh Tank, Vidisha

8.4.1 Compensatory Afforestation

Fencing and trenches were made. The site was being encroached by the dwellers. Although the site was proposed for raising Bamboo plantation but when we visit the place, it was used for agriculture purpose and was being encroached.

Figure 13: Compensatory Afforestation at Maksudangarh

8.4.2 Catchments Area treatment Plan

Although measures in the form of check dam and stop dam were taken but these were not managed properly. When we visit the site it was filled with litters.

Figure 14: Check dam at Maksudangarh

Figure 15: Stop Dam at Maksudangarh

8.4.3 Canal Plantation

There was no canal plantation seen either on the reservoir side or on the foreshore side.

Figure 16: Canals at Maksudangarh

8.4.4 Resettlement and Rehabilitation

One village Basilgarh under Tehsil Lateri District Vidisha was coming under submergence completely while the agriculture land of village Aari under the same Tehsil and district was also coming under submergence partly. The village families were shifted to the village Mahawan.

It has been mentioned in the project reports that the consent of the villagers affected was to be obtained as per the rehabilitation plan, but discussion with the affected families showed that no such consent was taken from them .However no conclusion could be made, since it may be the case that some of the people of the village might have been consulted .But this was sure that consent of the whole village was not taken.

8.4.5 Specific Observation

The site was heavily encroached by the villagers. Agriculture was raised on the forest land which was not controllable. The villagers cut down all the bamboo plants which was raised for the CA for their own benefits and did agriculture.

Figure 17: Encroached site at Maksudangarh

8.5 Pehsari Dam, Gwalior

8.5.1 Compensatory Afforestation

Since the site was hilly in terrain the condition was not good. Trees like Babool, Subabool were grown.

But trenches were made which also help in moisture conservation.

Figure 18: CA site for Pehsari dam

8.5.2 Catchments Area treatment Plan

Not done.

8.5.3 Canal Plantation

No canal plantation was done.

8.5.4 Resettlement and Rehabilitation

No village came under submergence, therefore no rehabilitation was required.

8.6 Rampurakhurd Canal

8.6.1 Compensatory Afforestation

There were no compensatory Afforestation areas visited by us. As CA was not done.

8.6.2 Catchments Area treatment Plan

The catchment area treatment measure was taken but the site was encroached by the village dwellers.

It was not done at the crucial places.

Figure 19: Contour Bunding as CAT measures

8.6.3 Canal Plantation

There was no plantation done on the canal side. Whatever plantation we saw those were naturally grown.

Figure 20: Canals for Rampurakhurd

8.6.4 Resettlement and Rehabilitation

Total 109 families have received payment of their land. The land for resettlement was proposed in village Narpakhedi at a distance of two Kms from submergence. 8.10 ha was proposed for this purpose. 182 number of plot with basic amenities like school, drinking water, playground, community hall and roads were proposed. Necessary provision for recreation of houses was also made.

Figure 21: R & R for Rampurakhurd

In regard to various compliances being given for each project, we came across our observation.

i. In majority of the project the funds for Compensatory afforestation have been released by the user agency. The area for CA i.e. the non forest area has been selected. But plantation of all the area has not been done properly. Also one of the provision of Conditionalities is that the user agency will provide water free of cost to the FD for raising of the nursery and CA but in all the project we observed that plantation were dependent upon rainfall.

ii. Coming to another major Conditionalities i.e. Tree plantation on sides of canal, foreshore and reservoir have also not been done in any project visited by us. Whatever plantation we saw on the canal sides was all because of the natural growth.

iii. The rehabilitation and resettlement plan was being stipulated for every project. Also all the facilities including drinking water, school, medical facility etc were being stipulated for every project.

iv. The catchment area treatment plan was stipulated for the entire project. But at some places CAT measures taken like stop dams, check dams were not being managed properly like in Maksudangarh Project.

v. **Bawanthadi Project, Nagpur -** Unlawful Canal Construction on 25 ha (approx.) of non approved forest land was done, the was work stopped in 2007,but finally got approval for the same in 2008.They also paid fine of 8crores.

vi. **Omkareshwar Dam –** In the research conducted by Wildlife Institute of India (WII), for the loss of riparian forest it was recommended to make Omkareshwar Sanctuary, Surmanya Sanctuary and Narmada Sanctuary, which are yet to be declared.

vii. **Pehsari Dam, Gwalior-** User agency has not yet paid fine of four lakhs levied by FD for violation. They filled the reservoir prior to the final approval and thus good forest was submerged.

Chapter 9: Data Analysis

A wide spectrum of projects were studied therefore a common parameter was not possible to be chosen to rank the projects on their Status of Compliances .Out of the six projects three projects were major projects while three were medium projects thus their conditionalities were different .Also all projects were having conditionalities according to the requirement of the project. For a comparative analysis of the projects the projects were firstly, assigned percentage of compliance on the basis of number of conditionalities complied from the total conditionalities to be complied. Secondly, the projects were assigned percentage on the quality of the work of the complied conditionalities. Finally, the two were combined and overall percentage was calculated and projects were assigned ranks on that basis.

9.1 Conditionalities Status

For conditionalities percentage was calculated for total conditionalities which were followed out of total conditionalities specified for each project.

Year of Approval	Project	Conditionalities followed
2005	Sanjay Sagar Wah Irrigation Project ,Vidisha(M.P.) (Under Construction)	Out of 16 conditionalities four conditions were to be followed after completion of the project. Therefore out of 12 conditionalities five were complied whereas seven were not complied.
2004	Omkareshwar Multipurpose Project ,Khandwa(M.P.) (Completed)	Out of 16 conditionalities four were not able to be monitored due to logical reasons. Therefore out of 12 conditionalities nine were complied and three were not complied.
1989	Rajeev Sagar (Bawanthadi) Irrigation Project, Bhandara (Maharashtra) (under construction)	Out of 13 conditionalities two were not able to be monitored while five were to be followed after construction of the dam. Therefore out of six conditionalities three were followed and three were not followed.
1993	Maksudangarh Tank, Vidisha (M.P.) (Completed)	Out of four conditionalities three were followed one was not followed.
1987	Pehsari Dam, Gwalior(M.P.)	Out of six conditionalities two were not able to be monitored. Therefore

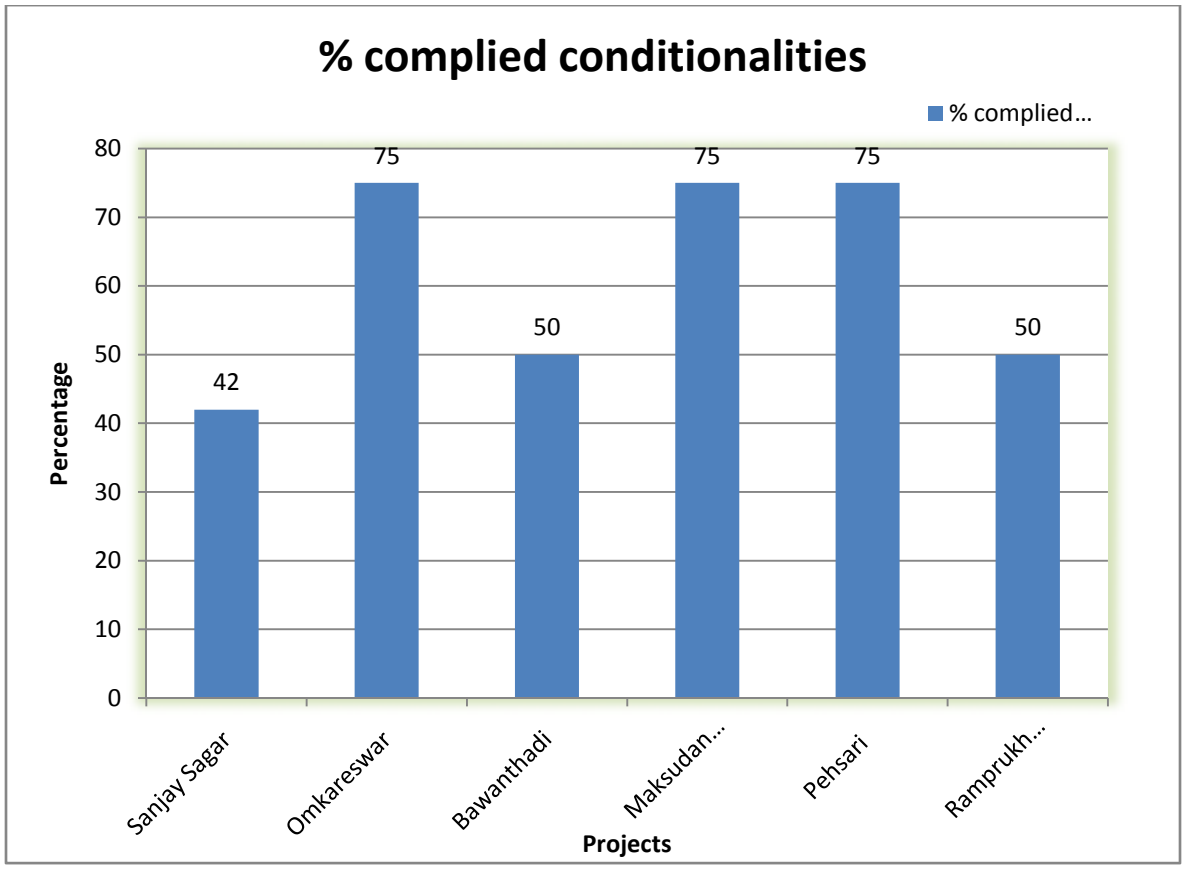
	(Completed)	out of four conditionalities three were followed one was not followed
1990	Rampurkhurd Tank, Sehore(M.P.) (Completed)	Out of six conditionalities two were not able to be monitored. Therefore out of four conditionalities two were followed two were not followed.

(Source 26: pers obs)

Thus, Sanjay Sagar Wah Irrigation Project was far behind fulfilling its all conditionalities, whereas Maksudangadh Tank, Vidisha was the most efficient project in terms of fulfilling its conditionalities.

Below is the bar graph showing the percentage of complied conditionalities of all the six projects .In calculation of percentage , conditions which were not able to be monitored were not taken into account as well as conditions which were to be complied after project completion were not taken into account.

Graph 2: % complied conditionalities



It was inferred from the graph that Sanjay Sagar Project was lagging behind in compliance of its conditionalities. Omkareshwar, Maksudangarh and Pehsari were at the same level of seventy five percent in complying with their conditionalities.

9.2 Quality of Complied Conditionalities

For assessing the quality of the major conditions certain indicators were identified . On the basis of how many indicators were followed overall percentage for that condition was calculated. The major conditionalities were CA, CAT, canal side plantation, and R&R plan.

The table shows the conditionalities along with the indicators to show their quality

Table 24: Conditionalities and Indicators

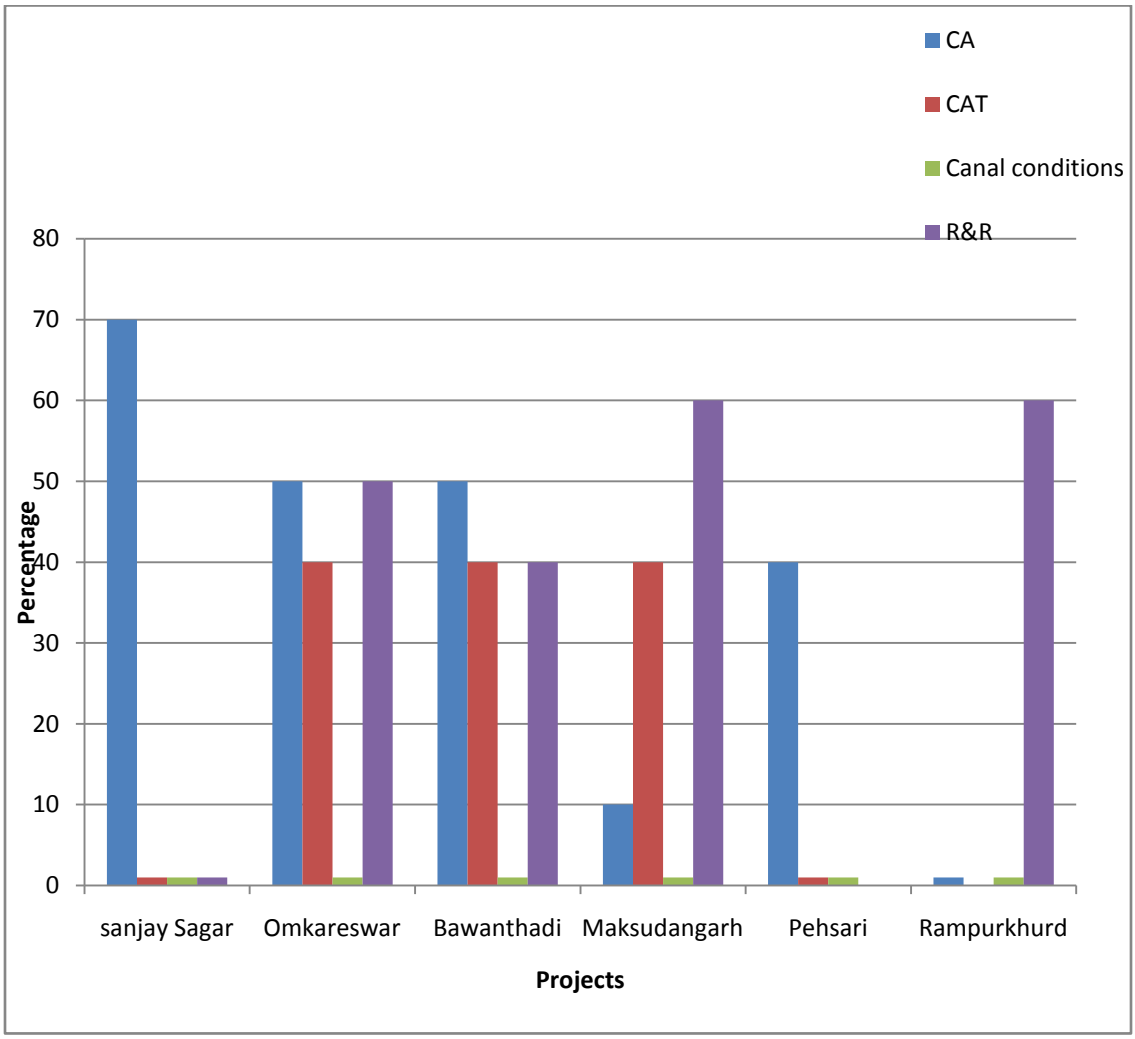
S.No.	Conditionalities	Indicators
1.	CA	Fencing, Irrigation, Grazing, Soil quality, Watch Guard, Growth, survival rate, Encroachment, Maintenance and Fire line.
2.	CAT	Stop Dam, Check Dam, tree Plantation, Contour Bunding and field Bounding
3.	Canal side Plantation	Canal plantation, Foreshore plantation and waste land Plantation
4.	R&R	Fair and just Compensation, Land for Land, Health Facilities(Hospital), Education facilities(School), Electricity, Water supply, Roads, Land Plots, Priority in jobs and Transport facility during rehabilitation.

(Source 27: pers obs)

These indicators are not the exhaustive and only means of quality indicators. These were only some major factors which determine the quality of the work done.

On the basis of how many quality indicators were followed the overall percentage for quality was given to each of the above mentioned conditionalities. The graph below depicts the quality percentage for different conditionalities in each project.

Graph 3: Quality of complied conditionalities



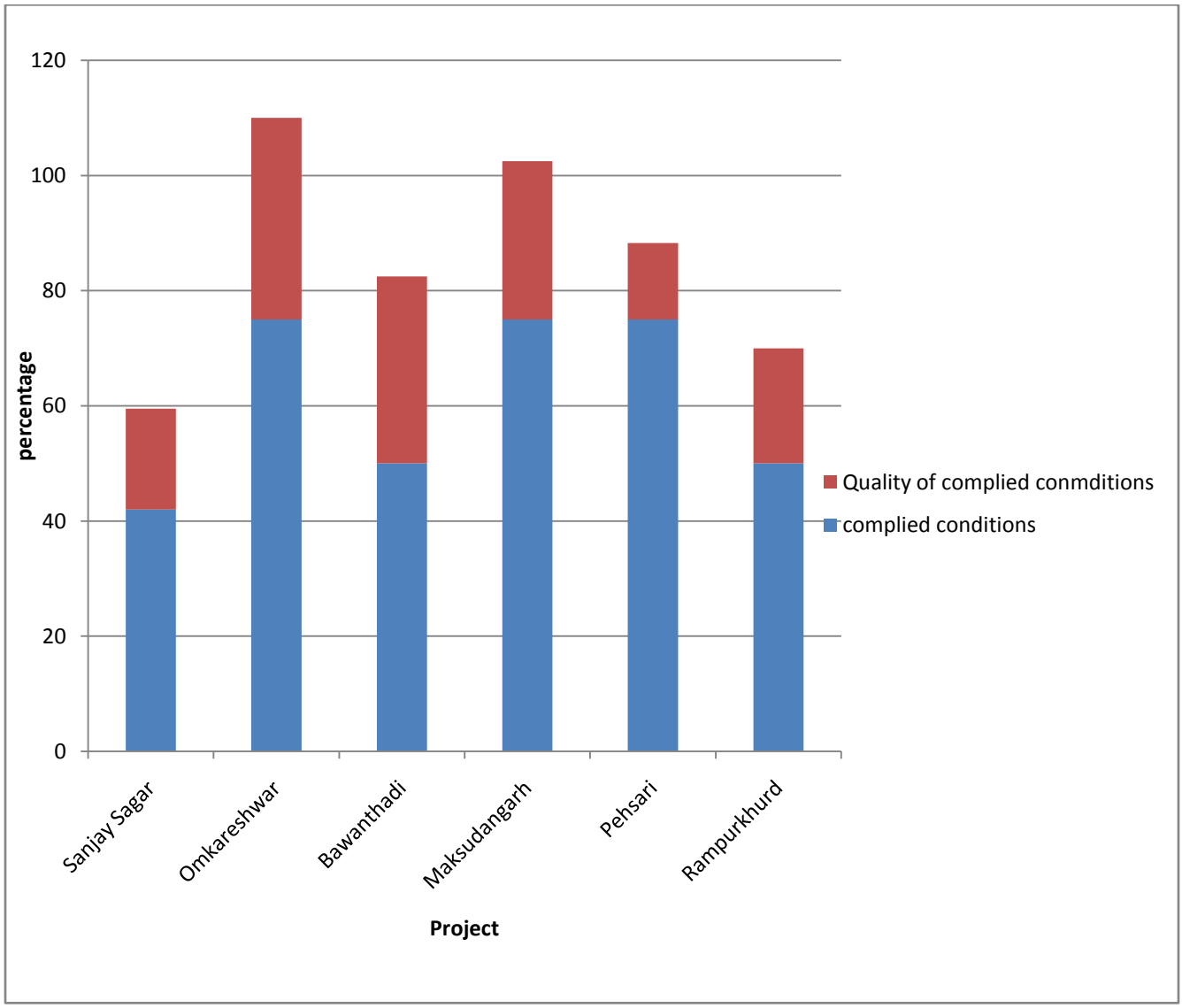
The value zero indicates that conditionality was not required in that project; while the value one indicates that the conditionality was not followed in the project. From the graph it can be concluded that Omkareshwar Project followed its conditionalities with a better quality than others and Sanjay Sagar project followed its conditionalities with the least quality.

For rating the projects the basis chosen was overall percentage ,including the percentage of complied conditionalities and percentage got in quality of the complied conditionalities ,got by the projects.

This ranking basis did not include those conditionalities which were not able to be monitored due to either lack of sufficient information or inaccessibility to the area. Also some conditionalities were to be followed during construction of the project, since projects four projects were already completed ,those conditionalities could not be monitored.

The graph below shows the average percentage of complied conditionalities and quality of complied conditionalities.

Graph 4: Comparative Status of the projects



It is inferred from the graph that Omkareshwar Project is the best project among the six studied projects in terms of following and maintaining the quality of its defined conditionalities. Sanjay Sagar was the last among the six projects in following and maintaining the quality of its defined conditionalities.

CHAPTER 10: SUMMARY AND CONCLUSION

The results show that the best project was Omkareshawar Project which complied with maximum number of its conditionalities and Sanjay Sagar was complied with the least number of its conditionalities.We came with the following conclusions:

In regard to the compensatory afforestation, we saw that expect for one project it was not done properly in any of the projects. The survival rate was very poor. In lieu of the mature trees which are present on fertile, black cotton soil near the river basin what we get is the patch of small sites which are there for doing the CA. Also major compliance of providing water to the nursery free of cost by the user agency is never followed. Plantation is dependent on the rainfall.

So the CA should be taken seriously and there should be a proper research to be done for soil checking for knowing about the soil condition. Also there should be proper sign boards, fencing of the CA sites. Fire protection measures, Watch-guard should be also be there.

In regard to the canal plantation, it was done for none of the project. Whatever plantation we saw that was naturally grown. So this condition should also be taken into account seriously.

Another major conditionality being the CAT measures which was fairly good in all the projects. But still management is to be done for these measures. At some places check dams were filled with tree litters. There should be a proper guideline regarding the number of check dams or stop dams to be constructed.

The R & R plans are being followed in every project but still the time taken for such work is too long. The compensation given is also not up to the mark according to the affected people. And the compensation of giving land for land should be followed strictly. Effective public hearing for better support should be done.

Also there should be a proper database management system. And this database which will be form should be accessible to everyone.

Thus these multi-purpose water projects which are planned should be plan in a way that it should not have a large impact on forest, wildlife and also people. The CA raised should be seriously done. There should be strict rules which are to be followed against the people who violate the conditionality and do not follow the compliances. Sustainability should be major focus in every project

CHAPTER 11: RECOMMENDATIONS

i. The first most important thing that must be done for better vigilance of the projects is to form permanent monitoring committees for Minor ,Medium and Major Multipurpose Water Projects in India.

ii. Permanent boundary Demarcation To be made on the Reservoir for keeping better check.

iii. There should be proper demarcation of CA sites, sign boards should also be present giving relevant information regarding the CA done.

iv. Fire protection measures, fencing of the CA area and watch guards should be made available specially for large CA area.

v. User agency should be involved in working of various plans like CAT, CA and Command Area Development. It has been observed that because of the poor coordination between the FD and the User Agency these plans are not implemented properly. Also, User Agency gets rid of the environment part by just giving away the cost of work.

vi. Wildlife conservation plan may be stipulated as one of the conditions of forest clearance. Wildlife Conservation is a part of conditionalities of mining projects and not Multipurpose Water projects.

vii. Strict and defined measures against those not following the compliances in the stipulated time period should be taken.

viii. Effective public hearing should be conducted for better support of villagers. It has been observed that the people to be rehabilitated and resettled are never satisfied. So for their support proper public hearing should be done and demands should be considered.

ix. Research work can be done for better plantation strategies on poor soil because most of the non-forest areas given for CA are generally degraded and thus poor survival and growth of plants occurs.

x. Proper inventory Management should be done, so that data is not lost. Also the information should be made available to every level of hierarcy.

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APPENDICES

APPENDIX A - LIST OF ABBREVIATIONS/ACRONYMS

MoEF	Ministry of Environment and Forests
CA	Compensatory Afforestation
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
FD	Forest Department
FCA	Forest Conservation Act
F.R.L.	Full Reservoir Level
Ha	Hectares
GoI	Government of India
MP	Madhya Pradesh
SFD	State Forest Department
RCC	Roller-Compacted Concrete
EIA	Environmental Impact Assessment
EISs	Environmental Impact Statements
EMPs	Environmental Management Plans
WCD	World Commission on Dams
WII	Wildlife Institute of India
UNEP	United Nations Environment Programme
SACEP	South Asia Co-operative Environment Programme
ICIMOD	International Centre for Integrated Mountain Development
UNCED	United Nations Conference on Environment and Development
CSD	Commission on Sustainable Development
GEF	Global Environment Facility
ESCAP	Economic and Social Council for Asia and Pacific
SAARC	South Asian Association for Regional Co-operation
GEAC	Genetic Engineering Approval Committee
IBSC	Institutional Biosafety Committees
RCGM	Review Committee of Genetic Manipulation
SBCC	State Biotechnology Coordination Committee

APPENDIX B -QUESTIONNAIRE.

1.Status of village:

- ☐ Fully submerged:
- ☐ Partially submerged:

2.General information about village:

a) Village name: ……..
b) Tehsil: ……
c) Sarpanch: ……
d) Total houses: ☐

e) Population: ☐

3.Personal information:

a) Name: …….
b) Age: ……..
c) Number of members in family: …….
d) Source of income:
   - ☐ Agriculture
   - ☐ Livestock
   - ☐ labour
   - ☐ Others
e) Livestock available:
f) Agricultural land:
g) Crops grown:
h) Annual income:

4.Specific information:

a) Whether public hearing has taken place?
   Yes ☐ **No** ☐

b) If yes, whether Participated in public hearing?

c) Whether they are aware about the compensation to be given?
   Yes ☐ **No** ☐

d) Specific need they expect from the government:

……
……..
……
……..
……
……..

e) Problems faced:

……
……
……
……
……
……

f) Whether satisfied with compensation:

Yes ☐ **No** ☐

g) Alternative opportunity for livelihood they will cater:

……
……

h) Whether involved in construction of dam or other project related activities(plantation etc)?

Yes ☐ **No** ☐

APPENDIX C - PROFORMA

Part-I

1. Name/purpose of the proposal
2. No. and date of government of India's letter according permission
3. Area permitted to diverted
4. District and Forest division
5. Area actually diverted

Part – II (Details of CA)

1. Location of the area
2. Whether the afforestation is made on forest or non-forest land.
3. If on non forest land, the land has been declared as protected/reserve forest.
4. If no, the steps taken to declare it protected forest.
5. Whether the afforestation cost was paid by user agency.
6. If yes, the amount paid.
7. Whether the amount paid was deposited in separate fund and was utilized in addition to the normal funds for forestry operation.
8. Details of plantation raised, species planted in area
    a) Expenditure
    b) If compensatory plantation not raised, the reason for the lapse.
    c) Condition of plantation:%survival, avg ht, avg girth
9. Remarks: it should be mentioned that the plantation are identifiable as specifically related to the project.

Part –III (Planting of trees in case of transmission lines)

1. Number of trees planted
2. Year of plantation
3. Expenditure
4. Present condition of plantation: :%survival, avg ht, avg girth

Part – IV (Reclamation of the area worked under mining/quarrying)

1. Mining/quarrying work completed in area (ha)
2. Reclamation work done:

a) Item of work
b) Area in ha
c) Year
d) expenditure

3. present condition of the area work/reclaimed

Part –V (Condition stipulated by the Government of India other than mentioned above)

Nature of the terms/Condition Action taken

I.
II.
III.

Part –VI (Condition stipulated by the state Government in addition to the Govt. of India conditions, and other step taken to preserve forest, wildlife and present soil erosion etc.

Condition/Purpose Action taken

I.
II.
III.

Part –VII (Monitoring)

1. Whether any committee has been formed for monitoring of the action on condition stipulated.
2. If No, give reason. If yes give details.
3. Reports of the monitoring committee, if any.

Part –VIII

1. Abstract report of inspection of forest officers if any.
2. Remarks of the C.C.F. in regard to progress of the action on stipulated conditions.
3. Effect of the project on forest and wildlife.

APPENDIX D - CHOICE OF SPECIES

Choice of species shall be based on terrain, soil availability of water and local needs. The tentative species grown are:

A. Hilly rocky areas:

Prosopis juliflora, Neem, Kullu, Moyen, Ber etc.

B. Murrum gravelly shallow soil:

Neem, karanj, Anjan, Chirol, Khair, Aonla, Cassia siamea, Prosopis juliflora, Acacia sps, Tendu, Subabool, Siris etc.

C. Moderately hilly, gravelly, shallow soil:

Teak, Sissoo, Siris, Neem, karanj, Chirol, Khair, Aonla, Cassia siamea, Tendu, Babool etc.

D. Sandy loam to loam soil, gently sloping area:

Teak, Khamer, Bija, Eucalyptus, Bamboo, Sissoo, Shisham, Siris, Subabool, Acacia sps, Cassia siamea, Neem, Karanj, Aonla, Tendu etc.

E. Clayey Black cotton soil:

Neem, karanj, Bamboo, Babool, Acacia Senegal, Cassia siamea, saja, Eucalyptus, Imli, Mahua, Sirs, Tendu.

F. Water logged areas:

Mahua, Jamun, saja, Eucalyptus, Babool etc.

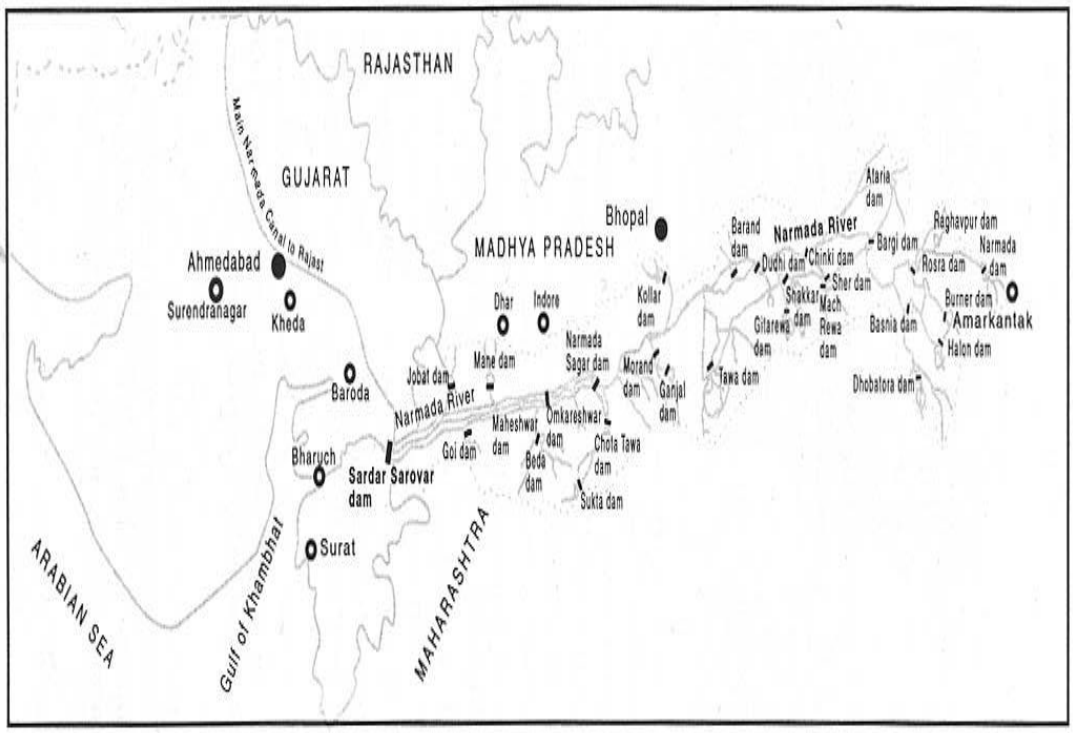
G. C.P.T. Bunds:

Prosopis juliflora, Bamboo, Babool, Agave etc.

Grasses to be grown (wherever feasible) are:

Cenchrus ciliaris, Cenchrus settigorus, Pennisetrum pedicellatum, Setaria speciolata, Chrysopogea fulvus, Dichanthia cinnalatum etc.

APPENDIX E :PHOTOS OF THE FIELDS VISITED



Narmada Valley and the proposed large dams

Photo 1: Canal of Omkareshwar Project, No Plantation on canalside

Photo 2: Plantation For Omkareswhwar Project, Poor Growth of Bamboo,amla

Photo 3: Check dams as measures for CAT ,Omkareshwar

Photo 4:Canal being dug up and quarry lying on the sides,Bawanthadi , Bhandara

Photo 5: Rich and dense forest which will submerge on side is the dry seasonal river ,Bawanthadi,Bhandara

Photo 6: Canal being dug up , Sanjay Sagar,VIdisha

Photo 7: Degraded forest of Vidisha near the dam site

Photo 8 : Canal of Maksudangarh, No plantation on canal side

Photo 9: Reservoir of Maksudangarh Tank, No Permanent boundary demarcation for FRL and Four mt below FRL

Photo 10 : People doing summer agriculture on the exposed reservoir land,Rampurakhurd,Sehore

Photo 11: Negligence in keep watch, empty watch guard tower, Rampurakhurd, Sehore

Photo 12: Plantation site of Pehsari , Gwalior, Poor survival and growth of plants(Babool,Subabool)

Photo 13: Dam of Pehsari,Gwalior

APPENDIX F : MAPS

D.1 Index Map- Sanjay Sagar Project

D.2 Map – Vidisha District

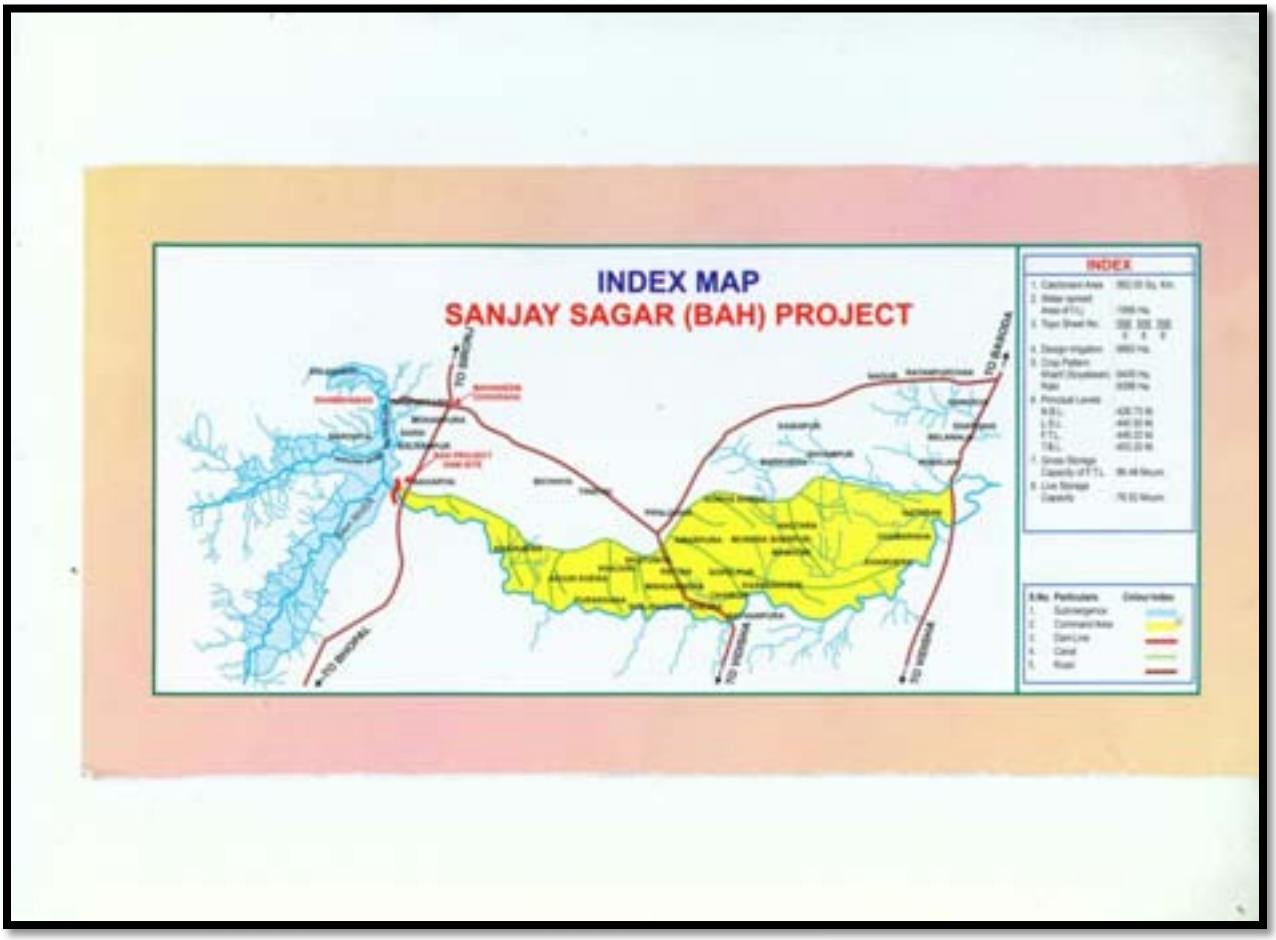
D.3 Index Map – Rajeev Sagar(Bawanthadi) Project

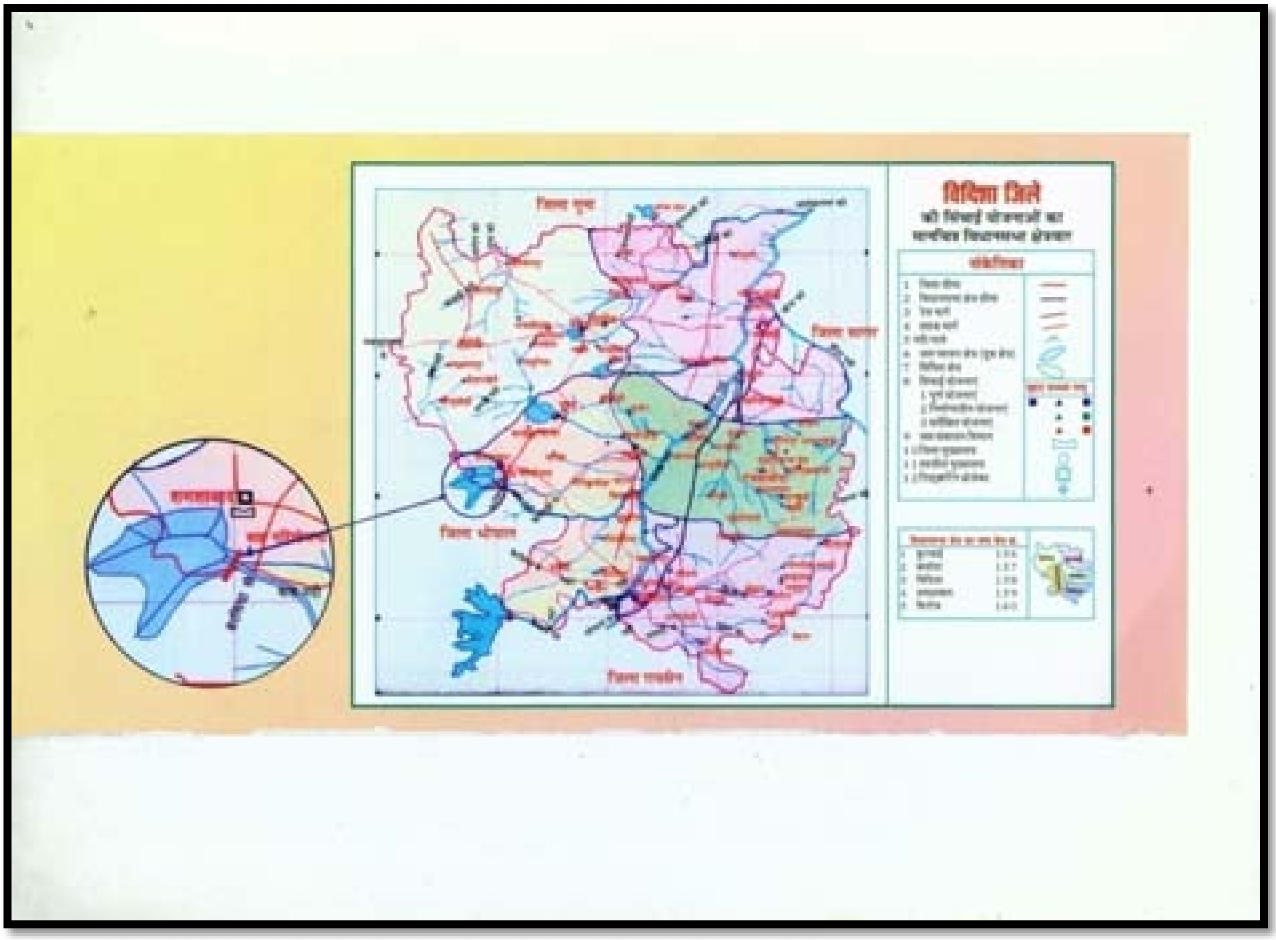
D.4 Index Map – Rajeev Sagar Project(Maharashtra)

D.5 Map – Rampurkhurd Project

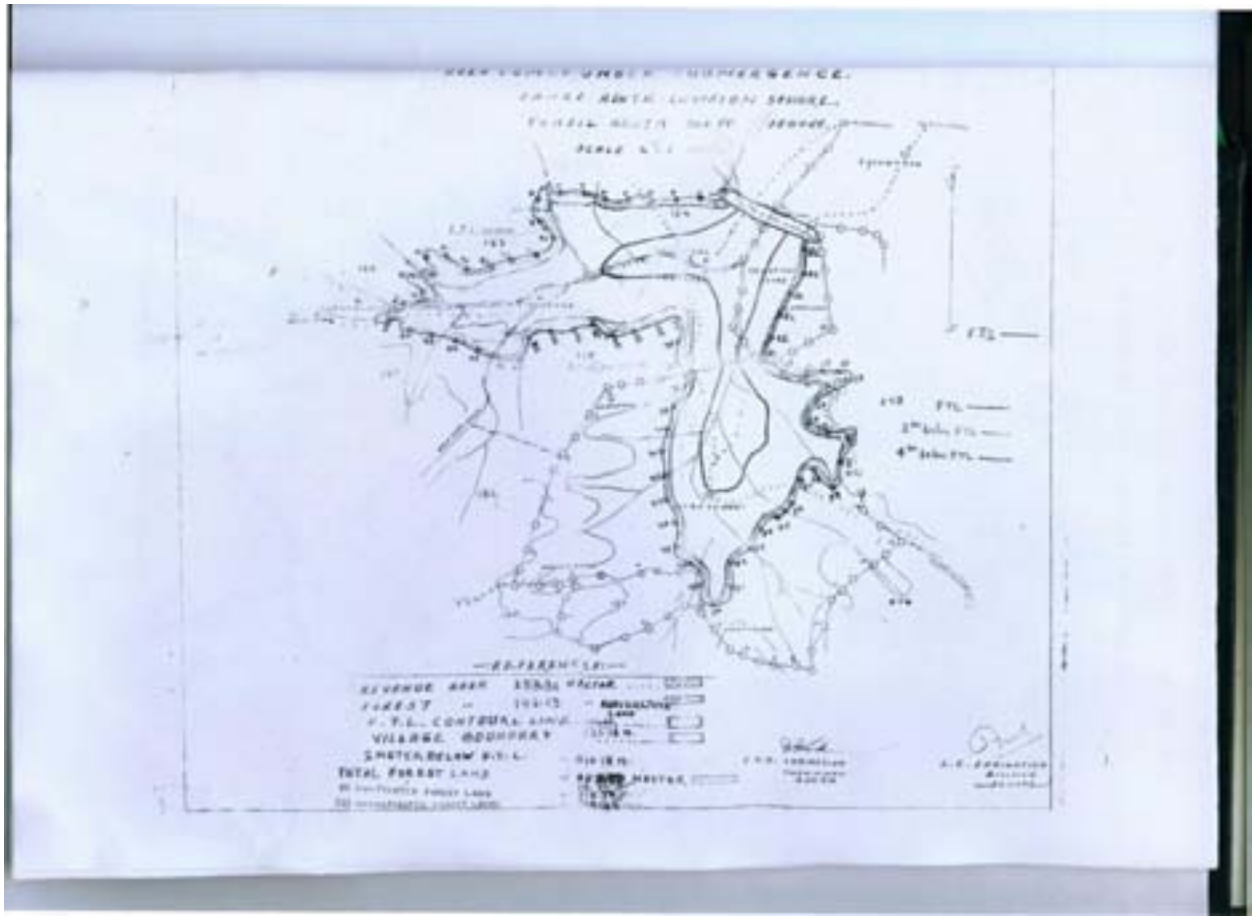
D.6 Map –RampurkhurdProject(CA site)

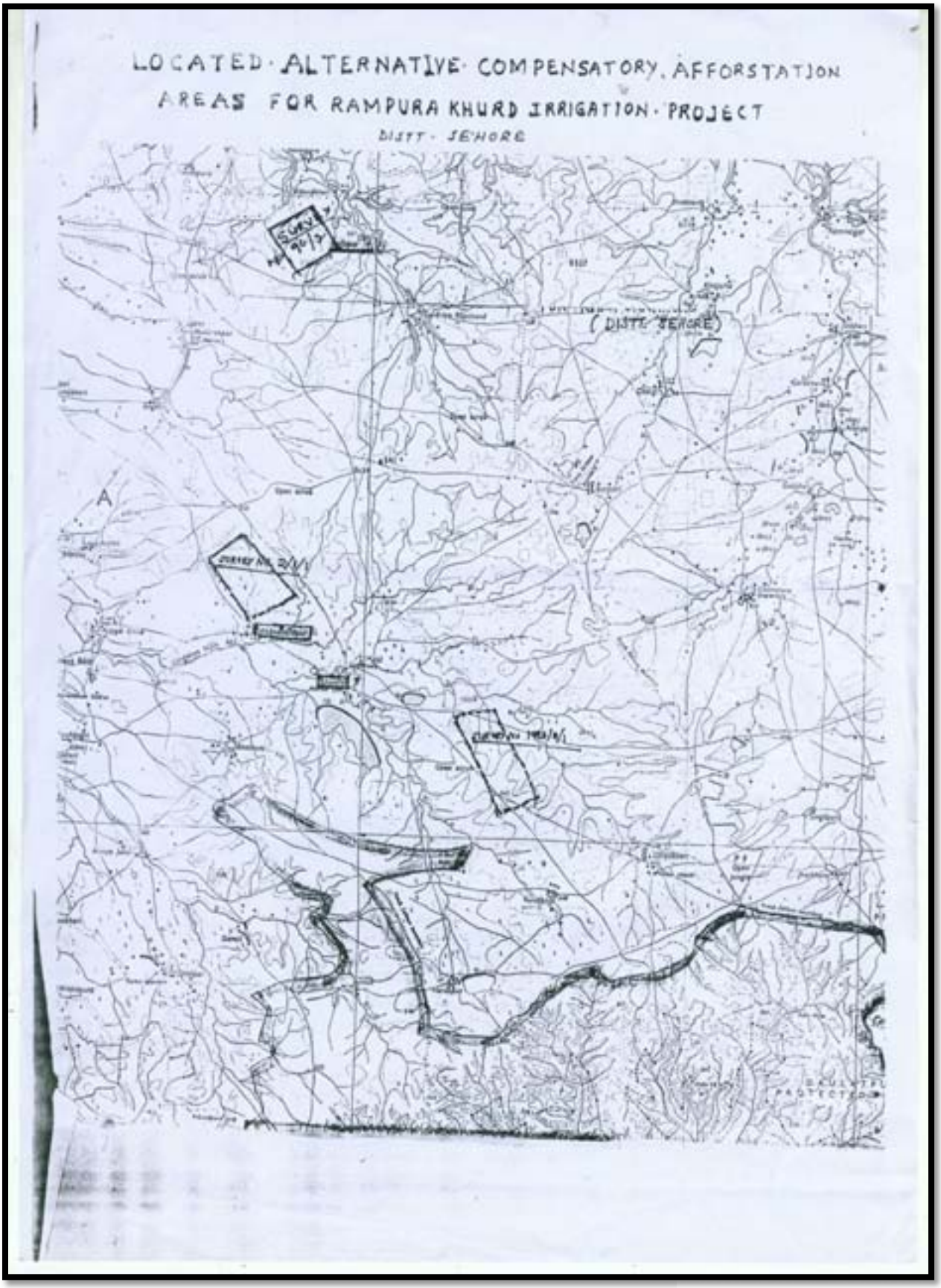
NOTE : Find the attached maps.


INDEX MAP
SANJAY SAGAR (BAH) PROJECT
INDEX




N
MADHYAPRADESH
MAHARASHTRA
INDEX MAP
BAWANTHADI PROJECT
GONDIA
INDEX




LOCATED · ALTERNATIVE · COMPENSATORY. AFFORSTATION
AREAS FOR RAMPURA KHURD IRRIGATION · PROJECT
DISTT · JEHORE
(DISTT. JEHORE)
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