Environmental and Social Impact Mitigation Measures Study (ESIMMS) of the DFC Project

Final Report

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MINISTRY OF RAILWAYS
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Environmental and Social Impact Mitigation Measures Study (ESIMMS) Report of the DFC Project

CONTENTS

Volume-1: Gujarat

Volume-2: Rajasthan

Volume-3: Haryana

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Table of Contents

Pages

List of Tables

List of FIGURES

List of Annex

LIST OF ABBREVIATIONS

AAQ	:	Ambient Air Quality
ADB	:	Asian Development Bank
AF_S	:	Affected Families
AIDS	:	Acquired Immunodeficiency Syndrome
ASI	:	Archaeological Survey of India
ASR	:	Ambient Noise & Vibration Measurement at Sensitive Receptors
BIS	:	Bureau of Indian Standard
BOD	:	Biological Oxygen Demand
cc	:	Cubic Centimeter
CF	:	Conservator of Forest
Cl	:	Chlorine
CO	:	Carbon Monoxide
CPCB	:	Central Pollution Control Board
CPR_S	:	Common Property Resources
CS	:	Construction Supervision
CWC	:	Central Water Commission, India
dB	:	Decibel
DFC	:	Dedicated Freight Corridor
DFCCIL	:	Dedicated Freight Corridor Corporation of India Limited
DFO	:	Divisional Forest Offices
DO	:	Dissolve Oxygen
DPR	:	Detailed Project Report
DR	:	Detailed Railway
EA	:	Environmental Assessment
EAC	:	Expert Appraisal Committee
EIA	:	Environment Impact Assessment
EMAP	:	Environmental Management Action Plan
EMP	:	Environment Management Plan
EMU	:	Environment Management Unit
ESIMMS	:	Environmental and Social Impact Mitigation Measure Study
EWG	:	Environmental Working Group
Fe	:	Iron (Ferrum)
GOI	:	Government of India
Hg	:	Mercury (Hydrargyrum)
HIV	:	Human Immunodeficiency Virus
ICD_S	:	Inland Container Depot
IS	:	Indian Standard
JARTS	:	Japan Railway Technical Services
JBIC	:	Japan Bank for International Cooperation
JICA	:	Japan International Cooperation Agency
JIS	:	Japanese International Standard
K	:	Potassium (Kalium)
LA	:	Land Acquisition
LA Act	:	Land Acquisition Act
LA_E	:	Exposure Noise Level
LAeq	:	Equivalent Noise Level
LPG	:	Liquefied Petroleum Gas
MLA	:	Member of Legislative Assembly
MOEF	:	Ministry of Environment and Forest

MP	:	Member of Parliament
MOR	:	Ministry of Railway
N	:	Nitrogen
Na	:	Sodium (Natrium)
NEP	:	National Environmental Policy
NGO	:	Non Government Organization
NK	:	Nippon Koei Co.Ltd.
NOx	:	Oxides of Nitrogen
NPRR	:	National Policy on Resettlement and Rehabilitation
NRCP	:	National River Conservation Plan
NRP	:	National Rehabilitation Policy
NTH	:	Non Titleholder
OM	:	Organic Matter
OP	:	Operational Policy
PAF_S	:	Project Affected Families
PAP_S	:	Project Affected Person
Pb	:	Lead (Plumbum)
PCCF	:	Principal Conservator of Forest
PCI	:	Pacific Consultants International
PCM	:	Public Consultation Meeting
PDA	:	Passenger Diesel A (Plain Route) Train
PIU	:	Project Implementation Unit
PUC	:	Pollution Under Control Certificate
RAP	:	Resettlement Action Plan
ROB	:	Railway Over Bridge
ROW	:	Right of Way
RPM	:	Respiratory Particulate Matter
R&R	:	Resettlement & Rehabilitation
RRP	:	Resettlement and Rehabilitation Plan
RS	:	Railway Station
RUB	:	Railway Under Bridge
SAR	:	Sodium Absorption Ratio
SC	:	Scheduled Caste
SDOE	:	State Department of Environment
SEIAA	:	State Environment Impact Assessment Authority
SGRY	:	Sampoorna Grammeen Rojgar Yojna
SHM	:	Stakeholder Meeting
SIA	:	Social Impact Assessment
SOx	:	Oxides of Sulphur
SPCB	:	State Pollution Control Board
SPM	:	Suspended Particulate Matter
SR	:	Sensitive Receptor
ST	:	Scheduled Tribe
TH	:	Title Holder
TOR	:	Term of Reference
VRC	:	Village Rehabilitation Committee
WB	:	World Bank
WHH	:	Women Headed Households
WHO	:	World Health Organization
WLS	:	Wild Life Sanctuaries
Zn	:	Zinc

CHAPTER 1 INTRODUCTION

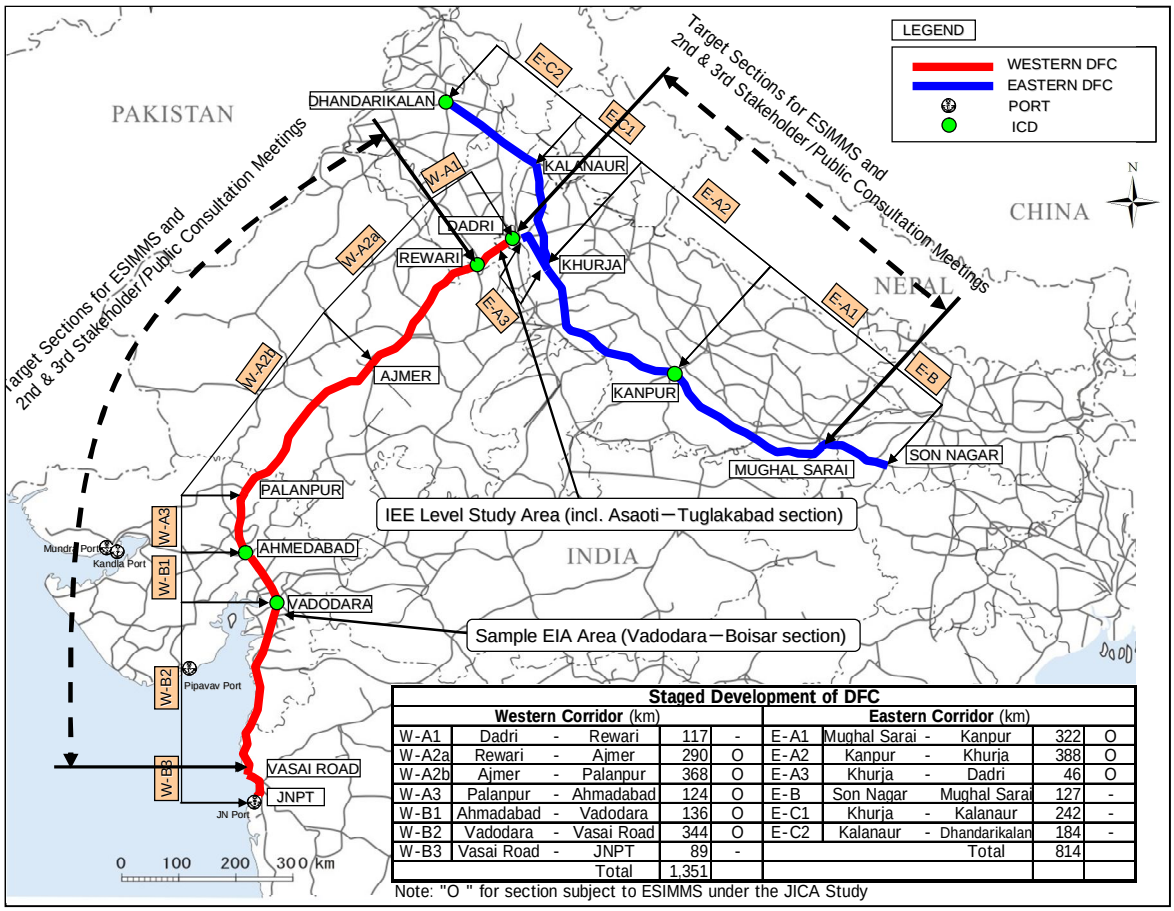
1.1 BACKGROUND

Indian Railways, the prime movers of the nation, have the distinction of being one of the largest railway systems in the world under a single management. Its contribution to the nation's progress is immeasurable and it has a dual role to play as a commercial organization as well as a vehicle for fulfillment of aspirations of the society at large. It is an important catalyst to growth of trade, industry and the economy as a whole, with immense potential for providing indirect employment. Considering this, Indian Government attaches the highest priority to the development and expansion of railway infrastructure. The Golden Quadrilateral and diagonals of the railway system are heavily congested routes and strengthening/widening of these routes has been taken up as part of National Rail Vikas Yojana. Surveys and construction of gauge conversion and new lines have been undertaken with a view to provide alternate routes to decongest the heavily utilized ones. Delhi-Mumbai and Delhi-Howrah stretches of Quadrilateral railway system have been identified as heavily congested routes and need to be decongested on priority basis.

In view of this, on the request of Ministry of Railways (MOR), Japan International Cooperation Agency (JICA) has conducted the feasibility study for the "The Development of Dedicated Multimodal High Axle Load Freight Corridor with computerized Control for Delhi-Mumbai and Delhi-Howrah in India (JICA F/S)". Objective of JICA F/S was to review the PETS and Final Location Survey (FLS) of the Dedicated Freight Corridor (DFC) Project that was supposed to be prepared by the GOI. However, since the FLS could not be available during JICA F/S, Guideline Design (GLD) and General Arrangement Drawings (GAD) have been proposed for the preparation of FLS for both Eastern and Western Corridors during JICA F/S.

The Environmental and Social Considerations Study (ESCS), which was equivalent to Initial Environmental Examination (IEE) level study, was conducted from November 2006 to March 2007 in the First Year of JICA F/S. In the Second Year of JICA F/S, Environmental and Social Impact Mitigation Measures Study (ESIMMS), which is equivalent to Environmental Impact Assessment (EIA) level study, has been conducted base on GLD and GAD covering the development stage sections between Rewari, Haryana and Vasai Road, Maharashtra (approx. 1,262 km) for the Western Corridor and between Dadri and Mughal Sarai, Uttar Pradesh (approx. 756 km) for the Eastern Corridor. The overall study area of ESIMMS is shown in Figure 1-1.

For the Western Corridor, ESIMMS has been conducted for the DFC route from Rewari to JNPT Mumbai which includes 2 districts of Haryana, 7 districts of Rajasthan, 12 districts of Gujarat and 1 district of Maharashtra. However, this ESIMMS report elaborates environmental and social impact mitigation measures for the DFC route in Haryana state upto Rewari Junction. The districts covered in this ESIMMS are Mahendragarh and Rewari.



Staged Development of DFC

Western Corridor (km)					Eastern Corridor (km)				
W-A1	Dadri - Rewari	117	-		E-A1	Mughal Sarai - Kanpur	322	O	
W-A2a	Rewari - Ajmer	290	O		E-A2	Kanpur - Khurja	388	O	
W-A2b	Ajmer - Palanpur	368	O		E-A3	Khurja - Dadri	46	O	
W-A3	Palanpur - Ahmadabad	124	O		E-B	Son Nagar Mughal Sarai	127	-	
W-B1	Ahmadabad - Vadodara	136	O		E-C1	Khurja - Kalanaur	242	-	
W-B2	Vadodara - Vasai Road	344	O		E-C2	Kalanaur - Dhandarikalan	184	-	
W-B3	Vasai Road - JNPT	89	-			Total	814		
	Total	1,351							

Note: "O " for section subject to ESIMMS under the JICA Study

Figure 1-1 Overall Study Area of ESIMMS

1.2 OBJECTIVE OF ESIMMS

The specific objective of ESIMMS is to ensure that potential problems are foreseen and addressed at an early stage in the project's planning and design. Design, execution and operation of the project can be planned in the light of the findings of this ESIMSS, so that the expected benefits from the DFC project can be sustained with minimum and acceptable adverse environmental impacts. The main objectives of ESIMMS are given below:

- Identification of the project activities likely to cause potential significant impacts on the environment.
- Identification of the extent of environmental impacts caused by DFC Project activities to the environment.
- Prediction and analysis of intensity and nature of impacts whether they are permanent or temporary, cumulative, and/or irreversible.
- Consultation with the general public as well as those concerned with the DFC Project, which are ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole by holding a series of stakeholder/public consultation meetings (PCMs). The broad objective of PCMs and its proper documentation is to verify opinions of the general public and other stakeholders that could be affected by the DFC Project.

1.3 SCOPE OF ESIMMS

In ESCS which was mainly conducted based on the collected secondary data as IEE level study, the major environmental and social consideration items were identified. Based on the results of ESCS, further EIA level study has been required for the following components.

(1) Natural Environment

The secondary data collection and survey of natural reserves, such as national parks and wildlife sanctuaries along the DFC alignment shall be conducted. Reserved forests and protected forests along the DFC alignment shall be examined to assess their impacts.

(2) Pollution Control

1) Sensitive Receptors (SRs) along the DFC alignment shall be identified for noise and vibration measurement. Ambient and railway noise/vibration levels shall be measured at the selected SRs. In addition, railway noise and vibration measurements were conducted along the DFC alignment to obtain unit sample data at 16 sites in total.

2) The secondary data collection of water quality, air quality and other components shall be conducted. The mitigation measures shall be proposed based on the analysis of the collected data.

(3) Social Environment

1) Field survey to identify the number of Project Affected Families (PAFs)[1] shall be identified.

2) Socio-economic questionnaire survey shall be conducted at 10% of total number of the identified PAFs.

3) The social impact assessment along the DFC alignment shall be conducted. The Resettlement and Rehabilitation Plan Framework shall be formulated.

(4) Stakeholder/Public Consultation Meetings

1) The 2nd Stage PCM was planned to be conducted at each district to be directly affected by the DFC Project.

2) Targeted PCM participants shall be representatives of Panchayats, villages and towns.

3) After the 2nd Stage PCM participated representatives of Panchayats, villages and towns shall disseminate the information obtained from the PCM amongst villagers and town residents, discuss with the issues and exchange opinions with residents at a village feedback meeting. The results of the village meeting shall be recorded.

4) In the 3rd Stage PCM, either one representative of each Panchayats, villages or towns or one representative of potential Project Affected Persons (PAPs) shall present their outcomes of the village meeting. The outcomes shall be discussed, and components of the suggested RRP Framework shall be agreed by the participants of the 3rd Stage PCM.

(5) Formulation of the Resettlement and Plan Framework

1) In the village feedback meetings to be organised before the 3rd Stage PCM, the RRP Framework shall be introduced to village residents. The components shall be confirmed and discussed by village residents.

[1] PAF is defined as Project Affected Families to be relocated; however, at the stage of ESIMMS, the number of affected residential structures is considered as PAF. The exact number of the PAF shall be identified by the detailed field survey at the next stage of the project.

2) The components of the RRP Framework shall be discussed and agreed by participants of the 3rd Stage PCM.

3) The social environmental monitoring plan shall be formulated in order to use for 3-5 years after the resettlement is completed.

(6) Environmental Management Plan (EMAP) and Environmental Monitoring Plan (EMOP)

EMAP and EMOP for construction of relevant railway facilities of each district shall be prepared.

Scope of ESIMMS as EIA level study has been elaborated in a well defined manner in Terms of Reference (TOR) as Technical Working Paper as part of JICA F/S. As per the TOR, major issues to be covered are summarized under four major heads as the details of major four components are discussed below:

- Natural Environment Impact Assessment Study
- Pollution Control Study
- Social Impact Assessment Study
- Stakeholder/Public Consultation Meeting

1) Natural Environment Impact Assessment Study

The significant environmental issues, particularly ecologically sensitive areas on natural environmental components such as topography, geology, soil, climate, land use, water bodies, and ecology etc. likely to be impacted due to proposed activities of DFC, were identified and a suitable and effective environmental management and monitoring plan to mitigate negative impacts and enhance positive impacts was prepared. Monitoring Plan was elaborated for construction period as well as spanning over 3-5 years covering locations sensitive to other pollution aspects as well as areas covering protected areas, wildlife sanctuary, eco-sensitive along DFC alignment. Effective and feasible measures were identified and elaborated necessary to take in order to mitigate, reduce, rectify or compensate adverse impacts caused by the project to the areas subject to protection of forest, wildlife, or any other species of fauna and flora and eco-sensitive areas. Baseline status of natural environmental components was prepared based on reconnaissance environmental survey and secondary data available. Detailed field survey was carried out to substantiate the findings focusing on forestry and railway side plantation using quadrate survey representing each forest by three minimum plots with size 10 m x 10 m. This was further supported by interview survey with relevant expert and local residents covering confirmation of the present situation in flora and fauna including avifauna.

2) Pollution Control Survey

The current status of water quality in rivers, air quality, noise, vibration along the proposed alignment was grasped based on mainly secondary data supported with reconnaissance field survey. Primary survey was carried out for ambient and railway noise and vibration including its attenuation at the selected sensitive receptors near proposed DFC alignment. Interview survey on noise and vibration with local residents living along the existing railway side at each monitoring location using suitable questionnaire was conducted so as to record the surrounding land use and other activities as well as to get the feedback from the local people. Noise and vibration levels were predicted and evaluated.

3) Social Impact Assessment Study

Baseline regional socio-economic status such as demographic features, social stratification, occupational pattern, land holdings, cultural aspects was prepared using secondary data. No of

Project Affected Families (PAFs) and its respective locations were identified in each district where resettlement of local people is necessary. Socio-economic primary survey on 10% of the population directly affected by the project in the respective district was conducted using a suitable questionnaire where construction of detours, junction/crossing stations, bridges, and other railway facilities so as to reflect baseline socio-economic status of PAFs. Based on the findings of socio-economic survey and extensive stakeholder/public consultation meetings, a Resettlement and Rehabilitation Plan (RRP) was elaborated for titled PAFs, non-titled PAFs, scheduled caste and tribes based on the provision of draft National Rehabilitation Policy, 2006. Social environment monitoring plan spanning 3-5 years was elaborated for PAFs after resettlement and R & R activities in a village or in a hamlet formed by bi-secting or fragmented by construction of DFC facilities.

4) Stakeholder/Public Consultation Meetings

Integrating valuable feedback from stakeholders from the conceptualizing and planning stage of the project has been recognized as important activities as part of EIA level study. In line with this, three rounds of PCMs have been planned in JICA F/S. The first round PCMs were hold in February 2007 during the First Year of JICA F/S, while the second and third rounds of PCMs have been conducted as part of ESIMMS. These two rounds of PCMs have been conducted in each project district. The key objective of second round consultation is to verify opinions of the general public that would be affected by the proposed alignment of DFC Project and elaborate with the PAFs a general framework of RRP. The key objective of third round consultation was to reach general agreement in principle with the identified PAFs in terms of the contents of RRP. During PCMs, a questionnaire is used to collect important feedback from all participants. Information on the DFC project as well as the record of the first round PCMs was disseminated through feedback meeting with head of each directly affected panchayat organization. All meeting proceedings were properly documented.

1.4 STUDY AREA

The project corridor which is covered by this ESIMMS starts from Nizampur (Mahendragarh District of Haryana) and ends at Rewari Junction (Rewari District of Haryana). The area of this ESIMMS included 2 districts namely Mahendragarh, Rewari consisting of 48 potentially affected villages by the DFC project.

Table 1-1 District and Village to be Covered by this ESIMMS in Haryana

District	No. of Villages Potentially Affected by the Project
Mahendragarh	24
Rewari	24
Sub-total	**48**

CHAPTER 2 APPLICABLE GUIDELINES, POLICIES AND LAWS

2.1 APPLICABLE NATIONAL POLICIES AND REGULATIONS

This chapter describes applicable guidelines, policies and laws at national and international levels that ensure certain level of quality in the infrastructure projects for ensuring sustainable development. The Objective is that the railway improvement project should not lead to major ecological or other losses to the country and the people that could nullify the otherwise immediately available project benefits. The various regulations apply to the design (project preparation stage), construction (implementation stage) and post project stage (operational stage) are provided in details in this chapter.

The primary responsibility of administration and implementation of the Government of India's policy with respect to environmental management, conservation, ecologically sustainable development, and pollution control rests with the Ministry of Environment and Forests (MoEF). The MoEF has agencies and institutions to implement the environmental polices as follows.

- **Central Pollution Control Board (CPCB):** It is a statutory authority attached to Ministry of Environment and Forests (MoEF)
- **MoEF Regional Offices:** The country is divided into several regions, with each region having a Regional Office.
- **State Pollution Control Board (SPCB):** These play the role in environmental management at the state level, with emphasis on air and water qualities.
- **State Department of Environment and Forests:** These perform function similar to MoEF only at the state level.

2.2 APPLICABLE REGULATIONS

List of all most important applicable GOI regulations are summarized in Table 2-1 below:

Table 2-1 Summary of Applicable Regulations

Applicable Policies & Regulations	Year	Objective	Applicability
Environment (Protection) Act	1986	To protect and improve over-all environment	Protect environment in general
Environment Impact Assessment (EIA) Notification	1994	Requirement of Environmental Impact Assessment	Direct
Air (Prevention and Control of Pollution) Act	1974	To control air pollution by controlling emission and air pollutants according to prescribed standards	Control of air pollution
Water (Prevention and Control of Pollution)	1974	To control water pollution by controlling emission and water pollutants according to prescribed standards	Control of Water Pollution
Indian Forest Act	1927	Protection and management of forests	Forests
Forest (Conservation) Act	1980	To regulate the conversion of forests for non-forestry purposes	Forests
The Wildlife (Protection) Act	1972	Protection of wildlife	Wildlife
Ancient Monuments and Archaeological sites &	1958	Conservation of Cultural and Historical Remains found in India	Archaeological Remains

Applicable Policies & Regulations	Year	Objective	Applicability
Remains Act			
Land Acquisition Act	1894 & 1989	Set out rule for Acquisition of land by Government	Land acquisition
Noise Pollution (Regulation and Control) Rules, 2000	2001	Noise pollution regulation and controls	Control of Noise pollution
Public Liability Insurance Act	1991	Assessment of Hazardous materials and accidents hazards	Health and safety
Biological Diversity Act	2002	Control of access to biodiversity	Biodiversity
EIA Notification	2006	For environmental impact assessment of major development projects	Environmental clearance
International environmental treaties to which India is a Party, such as Convention on Biological Diversity, Ramsar Convention on Wetlands, Bonn Convention on Migratory Species, UN Framework Convention on Climate Change and its Kyoto Protocol,, etc		International cooperation and domestic commitments in biodiversity conservation, greenhouse gas emission, etc	Environmental protection

Source: www.envfor.nic.in

The following sections elaborate relevant acts in the context of this project.

2.2.1 Environment Protection Act, 1986

The Environment Protection Act 1986 is an umbrella act providing for the protection and improvement of environment and for matters connected therewith. This act authorizes the central government to intervene directly in order to protect the environment and also allows public interest litigation for the same purpose. In terms of responsibilities, this Act and the associated Rules require obtaining environmental clearances for specific type of new/expansion projects addressed under EIA notification. Environmental clearance is not applicable for Railway Projects in India. Since Railway is one of the most environmental friendly mode of transport and basically non polluting in nature and do not involve any disposal of solid waste, effluents and hazardous substances on land, air and water, so limited requirements of Environmental (Protection) Act, 1986 are applicable particularly during construction stage of project.

2.2.2 EIA Notification in India

This is the Indian Government's guidelines for environmental impact assessment governing all of the development interventions that takes place within the boundaries of India. EIA notification was issued by Ministry of Environment and Forests (MoEF) in 1994 and later amended in 2002. Purpose of this was to impose restrictions and prohibitions on the expansion and modernization of any activity or new projects as specified in Schedule 1 in any part of India unless environmental clearance has been accorded by the Central Government or State Government in accordance with the procedure specified in the notification. The EIA notification was revised and notified on September 14, 2006 in order to make the EIA process more transparent and effective**.**

According to new latest gazette notification, there are two categories of projects via, category A and Category B. Category A will be cleared by the Ministry of Environment and forests at central level (Expert Appraisal Committee or EAC constituted by MOEF)) and the category B project will be cleared by the State Environmental Impact Assessment authority (SEIAA)

constituted by MoEF at State level. If there is no State level authority constituted, all categories of projects as spelt out in Schedule 1 would be dealt at central level.

The objective of the notification is:

To formulate a transparent, decentralized and efficient regulatory mechanism to:

- Incorporate necessary environmental safeguards at planning stage
- Involve stakeholders in the public consultation process
- Identify developmental projects based on impact potential instead of the investment criteria

Differences between EIA Notifications, 1994 & 2006

- Public consultation structured; to be conducted by SPCB and presided by DM (with in 45 days); proceedings to be videographed; MoEF to intervene if Public Hearing not held in time
- Time limits with consequences at each stage
- State Environment Impact Assessment Authority (SEIAA) at the state level and Expert Appraisal Committee (EAC) at central level

According to latest EIA notification, Railway and Bridge construction projects do not appear in the list of Schedule 1 and as such, are exempted from the Environmental Clearance.

2.2.3 Forest Conservation Act, 1980

This Act provides for the conservation of forests and regulating diversion of forestlands for non-forestry purposes. When any projects falls within forestlands, prior clearance is required from relevant authorities under the Forest (Conservation) Act, 1980. State governments cannot de-reserve any forestland or authorize its use for any non-forest purposes without approval from the Central government.

Applicability of Forest Conservation Act to Railway side Strip Plantations

In 1986, when MOEF enacted the Environmental Protection Act, the entire linear stretches of roadside, railway line and canal plantations were declared as protected forests. The February 18, 1998 MOEF circular on linear plantations on roadsides, canal and railway lines modified the applicability of provisions of Forest (Conservation) Act, 1980 to linear plantations. The new modification recognizes that the spirit behind the Forest (Conservation) Act was conservation of natural forests and not strips plantations. In the case of the "notified to be protected" railway side plantations, the clearance may be given by the concerned regional office of the MOEF, irrespective of the area of plantation lost. While issuing the approval, in place of normal provision for compensatory afforestation, the regional offices will stipulate a condition that for every tree removed at least two trees should be planted. If the concerned Regional office does not issue the decision within thirty days of the receipt of fully completed application, the project proponent may proceed with widening/expansion under intimation to the State Forest Department and the MOEF.

Central Rules, Guidelines and Acts related to forest are listed in Table 2-2.

Table 2-2 Laws Relevant to Forestry

Area/ Sector	Type	Level of Control
Forestry/ Forest Conservation	Acts Forest (Conservation) Act, 1980, amended 1988. The Indian Forest Act, 1927. State/Union Territory Minor Forest Produce (Ownership of Forest Dependent Community) Act, 2005 – Draft.	Govt. of India and All State Government
	Rules Forest (Conservation) Rules, 2003. Forest (Conservation) Rules, 1981, amended 1992.	Govt. of India and All State Government
	Guide Lines No.5-5/86-FC, [25/11/1994] – Guidelines for diversion of forest lands for non-forest purpose under the Forest (Conservation) Act, 1980.	Govt. of India and All State Government

Source: www.envfor.nic.in

Definition of various forest related terminologies used in this report are provided below.

Table 2-3 Forest Terminologies

Term	Definition
Forest	General term used to indicate all categories of forest reserves
Reserved Forest	The reserved forests are those forests where all settlement of rights has been completed. The Reserve Forests are always notified and everything is prohibited in these forests except what is listed in the notification. (Chapter II of Forest Act) Most protected forest category.
Protected Forest	In the case of Protected Forests all activities listed are allowed except what is not listed. (Chapter IV of Forest Act)
Demarcated PF	Demarcation of all legal verification has been complete. Legally protected
Undemarcated PF	Demarcation of all legal verification not complete. Legally protected
Unclassified Forests	Forest areas (govt. land) not notified as RF or PF (or Village Forest). This is not a legal category of forests, but managed by State Forest Departments.
Wildlife Sanctuaries	Strictly protected natural habitats designated as per section 18 of the Wildlife Protection Act.
National parks	Critical wildlife habitats designated as per section 35 of the Wildlife Protection Act. Stricter protective regulations than for Sanctuary.
Others (like cantonment and municipal forests)	These are forest areas raised, conserved and protected by Military and municipal authorities. No major ecological significance but protected.

Sources: relevant laws, etc

2.2.4 The Biological Diversity Act, 2002

To provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resources and knowledge, a convention, the United Nations Convention on Biological Diversity was formulated in 1992. India being a Party to the said Convention enacted the Biological Diversity Act in 2002 and it came onto force on 5th February 2003. The rules and orders issued under the Act are existing Laws on Biodiversity are given in Table 2-4.

Table2-4 Laws on Biodiversity

Area /Sector	Type	Level of Control
Biodiversity	Biological Diversity Act, 2002. NO. 18 of 2003, [5/2/2003] - The Biological Diversity Act, 2002. S.O.753 (E), [01/07/2004]- Coming in to force of sections of the Biodiversity Act, 2002. S.O.497 (E), [15/04/2004]- Appointment of non-official members on NBA from 1st October, 2003. S.O.1147 (E)- Establishment of National Biodiversity Authority from 1st October, 2003. S.O.1146 (E)- Bringing into force Sections 1 and 2; Sections 8 to 17; Sections 48,54,59,62,63,64 and 65 w.e.f. 1st October, 2003.	Govt. of India and All State Government
	Rules G.S.R.261 (E), [15/04/2004] - Biological Diversity Rules, 2004.	Govt. of India and All State Government

Source: www.envfor.nic.in

As per the provision of the Act certain areas which are rich in biodiversity and encompasses unique and representative ecosystems are to be identified and designated as biodiversity heritage sites facilitate their conservation. However, no site has been established in the country so far.

2.2.5 The Wildlife Protection Act, 1972

The first comprehensive legislation relating to protection of wild life was passed by the Parliament and it was assented by the President on 9th September, 1972 and came to be known as The Wildlife (Protection) Act, 1972 (53 of 1972). This law has given special importance for the protection of specified plants, control/ prohibition of trade or commerce in wild animals, animal article and trophies and hunting of animals, declaration of sanctuaries, national parks and closed areas etc.

Table 2-5 Laws on Wildlife

Area /Sector	Type	Level of Control
Wildlife	Acts The Wildlife (Protection) Act, 1972 (amended in 1993 and 2002.)	Govt. of India and All State Government
	Rules S.O.1092 (E), [22/9/2003] - The National Board for Wild Life Rules, 2003. S.O.445 (E), [18/4/2003] - The Declaration of Wild Life Stock Rules, 2003. G.S.R.350 (E), [18/4/1995] - The Wildlife (Specified Plant Stock Declaration) Central Rules, 1995. G.S.R.349 (E), [18/4/1995] - The Wildlife (Specified Plants - Conditions for Possession by Licensee) Rules, 1995. G.S.R.348 (E), [18/4/1995] - The Wildlife (Protection) Rules, 1995. Recognition of Zoo Rules, 1992. G.S.R.328 (E), [13/4/1983] - The Wildlife (Protection) Licensing (Additional Matters for Consideration) Rules, 1983. G.S.R.29 (E), [25/1/1973] - The Wildlife (Stock Declaration) Central Rules, 1973. G.S.R.198 (E), [9/4/1973] - The Wildlife (Transaction and Taxidermy) Rules, 1973.	Govt. of India and All State Government
	Wildlife Guidelines Guidelines for Appointment of Honorary Wildlife Wardens.	Govt. of India and All State Government

Source: www.envfor.nic.in

2.2.6 Land Acquisition Act, 1894

In India land is acquired by the Government for a public purpose under the principles of eminent domain, that is, the Government has the first right to land. Land is acquired by Government most commonly under the LA Act of 1894 modified in 1984. The amendment of 1984 extended the scope of the definition of public purpose and some of its norms related to time, amount and procedures of compensation were liberalized. However, the Act in essence remains unchanged. The Act is applicable to the whole of country except the State of Jammu and Kashmir. The land needed for the Dedicated Freight Corridor (DFC) project will be acquired under the LA Act of 1894 and compensated as per the provisions of Act unless decided otherwise by the Government. Land acquisition under the Act on an average takes two to three years time period. However, there is a provision of emergency clause under the LA Act but, in general; this clause is not invoked to acquire land. The compensation as per LA Act includes the award amount, 30 % solatium and interest @ of 12% from the date of U/s 4A. The valuation of trees and other immovable properties on the land is based as per the rates decided by the competent authority in consultation with concerned departments for the purpose of payment of compensation.

In fact one of the major criticisms of LA Act is that, though the Act provides that the market price of the land will be paid as compensation against acquisition and lays down the processes to arrive at the market price but in essence the market price for the purpose of paying compensation is much less than the prevailing market price which is one of the main reasons for opposition against acquisition and result in lengthy court cases. Some other criticisms of the LA Act are that the Act only deals with compensation of land and property acquired and does address rehabilitation issues at all which has become one the major problems of

development. Another important aspect of this Act is that it does not address the issue of non-titleholders which means under the Act only those who have legal ownership rights are eligible for compensation. One more major problem of this Act is that no compensation is payable to landless labourers, forest-land cultivators, forest produce collectors, artisans and shifting cultivators as they do not have any land record in the record of rights. Various sections of LA Act 1894 that are applicable for the completion of land acquisition are as under:

Sections		Description
3	-	Definition
4	-	Publication of preliminary notification and powers of officers to enter for survey
5	-	Payment for damage
5A	-	Hearing of Objections
6	-	Declaration that land is required for a public purpose
7	-	After declaration, Collector to take order for acquisition
8	-	Land to be marked out, measured and planned
9	-	Notice to persons interested
10	-	Powers to require and enforce the making of statements as to names and interests
11	-	Enquiry into measurements, value and claims and award by Collector
12	-	Award of Collector when to be final
13A	-	Correction of Clerical Errors, etc.
16	-	Power to take possession
17	-	Special powers in cases of urgency
18	-	Reference to court
23	-	Matters to be considered in determining compensation
24	-	Matters to be neglected in determining compensation

2.2.7 Noise Pollution Regulation and Control Rules 2000

As a result of considering the deleterious and psychological effects of the noise pollution on the human well being, Ministry of Environment and Forest (MoEF) has drawn up the above rules, which have come to force with effect from February 14 2000. According to the provisions of the Rules notified, a person could make a complaint to the designated Authority in the event that the actual noise levels exceed the ambient noise standards by 10 dB or more as compared to the standards prescribed in the Schedule of the Rules. The designated authority will take action against violator in accordance with the provisions of these rules or other laws in force.

2.2.8 The Air (Prevention and Control of Pollution) Act, 1981

This Act provides for the prevention, control and abatement of air pollution. It is applied when air polluting activity in an air pollution control area or when emissions of any air pollutants into the atmosphere exceed the standards set by the Central and State Boards.

2.2.9 Water (Prevention and Control Pollution) Act

The Water (Prevention and Control of Pollution) Act, 1974 resulted in the establishment of the Central and State level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, as well as monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of certain facilities.

2.2.10 Other Relevant Acts

The other relevant acts that will be involved with the project are given below.

Cultural Environment Related Act, 1958

As a result of growing interest in cultural heritage in the nation, both government agencies and NGOs concerned with the preservation and conservation of this heritage have been established. The Archaeological Survey of India (ASI) is the organization working on the protection and conservation of monuments and archeological sites. It is supported in its endeavors by the state Directorate of Archeology. The ASI administers the Ancient Monuments and Archaeological Sites and Remains Act, 1958. According to this act, areas within radii of 100 m and 300 m from the "protected property" are designated as "protected" and "controlled" respectively. No development activity is permitted in the protected area, without prior permission of the GOI. Similarly, certain development (likely to damage the protected property) activities require prior permission from GOI. Conservation for the designated protected monuments/sites/remains is addressed by the existing legislation. However, there are several railway side cultural properties that are not "protected", but are of significant cultural or religious value to the community. No procedure exists at present for conservation of these "smaller" cultural properties.

Motor Vehicle Act, 1988

In 1988, the Indian Motor Vehicle Act empowered the State Transport Authority to enforce standards for vehicular pollution and prevention control. The authority also checks emission standards of registered vehicles, collects road taxes, and issues licenses. In August 1997, the "Pollution Under Control Certificate" (PUC) programme was launched in an attempt to crackdown on the amount of vehicular emissions in the state. To date it has not been highly effective.

Regulation/Act governing Vibration

There is no prevailing regulation/standard in India governing train induced ground vibrations. Regulations/standards prevailing in other countries such as USA, Japan, and Sweden etc. have been reviewed and compared with the findings of vibration monitoring in its respective chapter. Vibration Regulation Law in Japan issued by Ministry of the Environment, Government of Japan stipulates to preserve living environment and contribute to protection of the people's health by regulating vibration. As per this law, standards for vibration emitted from specified construction works and limits for motor vehicle vibration have been provided for different land use pattern. As per USA Federal Transit Administration, the criteria for environment impact from ground-borne vibration are based on the maximum root-mean-square (rms) vibration levels for repeated events from same source. Experience based on international standards provides a good foundation for predicting and controlling annoyance from ground-borne vibrations in residential areas as well as interference with vibration-sensitive activities.

Applicable Cross Sectoral Laws

There are a number of laws that are cutting across all sectors and development process of the country. Some of these are directly relevant especially during the construction stage are listed in Table 2-6.

Table 2-6 Cross Sectoral Laws that has Applicability in Infrastructural Development Projects

Applicable GOI Acts	Year	Objective	Applicability
Minimum wages Act	1948	As per this act, the employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government.	Direct
Child labour (prohibition and regulation) Act	1986	This Act prohibits employment of children below 14 years of age in Building and Construction Industry covering Railway.	Direct
Labour Act	1988	The health and safety of workers employed in construction work etc	Direct
The Factories Act	1948	Health and Safety considerations for workers	Direct
Workmen's Compensation Act	1923	This act provides for compensation in case of injury by accidents arising out of and during the course of employment.	Direct
Contract Labour (Regulation and Abolition) Act	1970	This act provides for certain welfare measures to be provided by the contractor to contract labour.	Direct
Payment of Wages Act.	1936	It lays down as to by what date the wages are to be paid, when it will be paid and what deduction can be made from the wages of workers.	Direct
Equal Remuneration Act	1979	This act provides for payment of equal wages for work of equal nature to Male and Female and not for making discrimination against Female employees.	Direct
The Building and other Construction Workers Act	1996	All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. The employer is required to provide safety measures at construction work site and other welfare measures such as canteens, first-aid facilities, ambulance, housing accommodation for Workers near the Workplace etc.	Direct

Source: www.worldbank.org

After several years of negligence, Government of India now decided to strictly apply the Child labour Act to all sectors that are exploiting the children's at their younger age for personal, economic and other benefits. According to this law children's are for primary education till the age of 14 and then up to the age 18 years children if employed should not be engaged in the hazardous working conditions.

2.3 APPLICABLE POLICIES & STRATEGIES

Applicable guidelines and policies/strategies relevant to this project are described below.

2.3.1 JICA Guidelines on Environmental and Social Considerations

JICA prepared the new guidelines on environmental and social considerations in March 2004. As per this guideline, JICA supports the recipient governments by offering cooperation projects into which JICA incorporates appropriate environmental and social considerations so as to avoid or minimize development projects' adverse impacts on the environment and local communities. JICA thus promotes sustainable development in developing countries. JICA

recognizes the following seven principles to be very important under environmental and social considerations of a project.

- Coverage of a wide range of environmental and social impacts to be addressed.
- Implementation of measures for environmental and social considerations at an early stage in project cycle based on analysis of alternatives.
- Incorporation of outcome of environmental and social considerations in the implementation of projects after cooperation projects is terminated.
- Paying attention to accountability and transparency when implementing cooperation projects.
- Ensuring the meaning participation of stakeholders in order to take consideration of environmental and social factors and to reach consensus accordingly.
- Disclosing information on environmental and social considerations in order to ensure accountability and to promote participation of various stakeholders.
- Capacity building of Organizations to consider environmental and social factors appropriately and effectively at all times.

JICA classifies projects under three categories (A, B and C) according to extent of environmental and social impacts similar to the funding agencies categorization like World Bank, ADB and JBIC. To make this classification, JICA takes into account an outline of the project, the scale, site condition, and environmental impact assessment study scheme in host countries.

As per JICA guidelines, the impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety as well as the natural environment. Impacts on the natural environment include trans-boundary or global-scale impacts through air, water, soil, waste, accidents, water usage, climate change, ecosystems and biodiversity. The impacts to be assessed also include social impacts, which include the migration of populations and involuntary resettlement; local economy such as employment and livelihood; utilization of land and local resources; social institutions such as social infrastructure and local decision-making institutions; existing social infrastructures and services; vulnerable social groups such as the poverty level and indigenous peoples; equality of benefits and losses and equality in development process; gender; children's rights; cultural heritage; local conflict of interests and infectious diseases such as HIV/AIDS.

In addition to the direct and immediate impacts of projects, derivative, secondary and cumulative impacts are also to be assessed in regard to environmental and social considerations within the extent possible. JICA takes into account the importance of good governance surrounding projects so that measures for appropriate environmental and social considerations are implemented. JICA respects the principles of internationally established human rights standards like the International Convention on Human Rights, and gives special attention to the human rights of vulnerable social groups – including women, peoples, persons with disabilities, and minorities – when implementing cooperation projects. JICA obtains country reports and information issued by related institutions about human rights, and JICA understands local human rights situations by disclosing information about cooperation projects.

When JICA's assessment differs from the review by JBIC, JICA conveys its own relevant information to Japan Bank for International Corporation (JBIC), and requires JBIC to undertake adequate measures. JICA discloses the information after making inquiries to the recipient governments and related organizations. When significant impacts become clear and JICA judges it difficult to address them, JICA makes recommendations to the Ministry of Foreign Affairs of JAPAN (MOFA) to stop the studies. JICA discloses recommendations after making inquiries to the recipient governments and related organizations.

The present project is committed to address all requirements of JICA guidelines on environmental and social considerations.

2.3.2 JBIC Guidelines on Environmental and Social Considerations

JBIC established "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" on April 1, 2002, as unified guidelines of two environmental guidelines applied to International Financial Operations and Overseas Economic Cooperation Operations respectively. The Guidelines has been implemented from October 1, 2003.

JBIC Guidelines give guiding principles related to environmental consideration by JBIC in its appraisal of a project. They also give the environmental matters to be considered and environmental measures to be prepared by the recipient country in the planning and preparation stages of a project. Projects have been categorized into three basic categories A, B and C depending upon extent of involvement of significant environmental and social issues similar to other funding agencies such as World Bank and ADB.

As per JBIC guideline, projects must, in principle, be undertaken outside protected areas that are specifically designated by laws or ordinances of the government for the conservation of nature or cultural heritage (excluding projects whose primary objectives are to promote the protection or restoration of such designated areas). Projects are also not to impose significant adverse impact on designated conservation areas.

JBIC guidelines focus on participation by stakeholders as local community inhabitants who will be affected by the project. They require the project executor to solicit stakeholders' participation from the project planning stage. The checklist to be confirmed by JBIC now includes social considerations pertaining to resettlement, indigenous people and women. Also more strengthened than in the previous guidelines is a provision on information disclosure. JBIC is required to make public such items as the category classification of the project prior to loan approval.

Projects must be adequately coordinated so that they are accepted in a manner that is socially appropriate to the country and locality in which the project is planned. For projects with a potentially large environmental impact, sufficient consultations with stakeholders, such as local residents, must be conducted via disclosure of information from an early stage where alternative proposals for the project plans may be examined. The outcome of such consultations must be incorporated into the contents of the project plan; Appropriate consideration must be given to vulnerable social groups, such as women, children, the elderly, the poor and ethnic minorities, all of whom are susceptible to environmental and social impact and who may have little access to the decision-making process within society.

Involuntary resettlement and loss of means of livelihood are to be avoided where feasible, exploring all viable alternatives. When, after such examination, it is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected;

People to be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by the project proponents, etc. in timely manner. The project proponents, etc. must make efforts to enable the people affected by the project, to improve their standard of living, income opportunities and production levels, or at least to restore them to pre-project levels.

Appropriate participation by the people affected and their communities must be promoted in planning, implementation and monitoring of involuntary resettlement plans and against the loss of their means of livelihood.

The present study integrated the basic concerns on environmental and social considerations as per the JBIC guidelines.

2.3.3 Asian Development Bank's (ADB) Environmental Policy

ADB's Environment Policy has been prepared to address five main challenges:

- the need for environmental interventions to reduce poverty
- the need to mainstream environmental considerations into economic growth and development planning
- the need to maintain regional and global life support systems
- the need to work in partnership with others
- the need to further strengthen the processes and procedures for addressing environmental concerns in ADB's own operations

The Policy highlights a number of areas that require attention in ADB's environmental assessment process. It addresses the need for more upstream environmental assessment at the level of country programming, the need for more structured consultation in the conduct of environmental assessments, the need for greater emphasis on monitoring and compliance with environmental requirements during project implementation, and finally the need to view environmental assessment as an ongoing process rather than a one-time event.

Similar to other funding agencies, projects are classified into category A (with potentially significant environmental impacts); category B (with potentially less significant impacts); category C (unlikely to have significant environmental impacts); and a new category, FI, (credit line for subprojects through a financial intermediary, or equity investment in a financial intermediary). A project's environment assessment category is determined by the category of its most environmentally sensitive component, including both direct and indirect impacts. An IEE is required for category B projects, and an EIA, requiring greater depth of analysis, for category A projects. No environmental assessment is required for category C projects although their environmental implications nevertheless need to be reviewed. The classification scheme helps conserve resources for project preparation, by ensuring that the greatest effort is deployed on projects with potentially the most significant adverse environmental impacts.

As per ADB's environmental policy, important considerations in preparing the environmental assessment include assessing indirect and cumulative impacts, examining alternatives, achieving environmental standards, designing least-cost mitigation measures, developing appropriate environmental management plans and monitoring requirements, formulating institutional arrangements, and ensuring meaningful public consultation.

The objectives of ADB's *Policy on Involuntary Resettlement* (November 1995), are to avoid involuntary resettlement whenever feasible, to minimize resettlement where population displacement is unavoidable, and to ensure that displaced persons receive assistance so that they are at least as well-off as they would have been in the absence of the Project. The policy stipulates three important elements in involuntary resettlement: (i) compensation for lost assets and loss of livelihood and income, (ii) assistance in relocation including provision of relocation sites with appropriate facilities and services, and (iii) assistance with rehabilitation so as to achieve at least the same level of well-being with the Project as before. The policy

further specifies that the absence of legal title to land cannot be considered an obstacle to compensation and rehabilitation privileges. All persons affected by the Project, especially the poor, landless, vulnerable, and disadvantaged households should be included in the compensation, transition allowance, and rehabilitation package.

2.3.4 World Bank Safeguard Policies

The World Bank has a number of safeguard policies; the details and applicability of the safeguard policies to the Project are provided in the Table 2-7.

Environmental requirements of the World Bank are specified in detail in its Operational Policy (OP) 4.01 and other related OPs. In instances in which the procedural and regulatory requirements differ, the more stringent applies. The World Bank environmental requirements are based on a three-part classification system.

- *Category A*-requires a full Environmental Assessment (EA).
- *Category* B-projects require a lesser level of environmental investigation.
- *Category* C-projects require no environmental analysis.

Table 2-7 Applicability of World Bank Safeguard Policies

WB Safe Guard Policy	Subject Category	Reason for its Applicability	Mitigation Measures	Documentation
OP 4.01	Environmental Assessment	Umbrella policy	All necessary mitigation measures incorporated.	EIA and EMP required
OP 4.04	Natural Habitats	Eco-sensitive -Forestry and wildlife related issues	A separate study is being carried	EMP.
OP 4.36	Forestry	Some Forest Land to be acquired	Compensatory Afforestation	EMP
OP 4.09	Pest Management	Not Applicable	Not Applicable	Not Applicable
OP 4.30	Involuntary Resettlement	Alignment will lead to loss of livelihood, land and house	Comprehensive action plan	Resettlement Action Plan prepared
OP 4.20	Indigenous people	Not Applicable	Not Applicable	Not Applicable
OP 4.11 (Draft)	Cultural Property	A number of temples, shrines etc are located adjacent to the alignment.	Adequate mitigation measures to be taken	EMP and RAP to be prepared to minimize the adverse effect on cultural property

Source: www.worldbank.org

As is clear from above table, five of the World Bank safeguard policies concern the current project. The environmental mitigation measure developed for the project needs to be in tune with these safeguard policies.

2.3.5 National Environmental Policies

The National Environmental Policy (NEP) 2006 is a response to national commitment to clean environment mandated in the Indian Constitution and is intended to mainstream

environmental concerns in all development activities. NEP recognizes environmental degradation as a major causal factor in enhancing and perpetuating poverty particularly among the rural poor. One of the key objectives of NEP is to integrate environmental concerns into policies, plans, programmes and projects for economic and social development. This policy has evolved from the recognition that only such development is sustainable, which respects environmental and ecological constraints. In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

2.3.6 National Forest Policies

Government of India in the erstwhile Ministry of Food and Agriculture enunciated a National Forest Policy to be followed in the management of State Forests in the country long time back in 1952. However, forests in the country have serious depletion over the years. The need to review the situation and to evolve a new strategy of forest conservation for the future has become imperative. In view of this, National Forest Policy was revised in 1988. The principal aim of new Forest Policy is to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which is vital for sustenance of all life forms, human, animal and plant. The derivation of direct economic impact must be subordinated to this principal aim. The policy envisions to enhance the forest coverage of the country to 33 % of total geographical area of the country.

2.3.7 Resettlement & Rehabilitation Policy

There is no comprehensive legislation, as yet, at the National or State level that governs the resettlement and rehabilitation of PAPs. Ministry of Rural Development (Department of Land Resources) approved a National Policy on Resettlement and Rehabilitation (NPRR) for Project Affected Families (PAFs), 2003, published in the Gazette of India on 17th February 2004. It recognizes the following essential features:

- That project affected families (PAF) not only lose their lands, other assets and livelihoods, they also experience adverse psychological and social/cultural consequences;
- The need to minimize large-scale displacement and where displacement is inevitable, resettlement and rehabilitation has to be handled with utmost care. This is especially necessary for tribal, small and marginal farmers and women;
- That cash compensation alone is often inadequate to replace lost agricultural land, homesteads and other resources. Landless laborers, forest dwellers, tenants, artisans are not eligible for cash compensation;
- The need to provide relief especially to the rural poor (with no assets), small and marginal farmers, SCs/ STs and women;
- The importance of dialogue between PAFs and the administration responsible for resettlement for smoother implementation of projects and R &R.
- The policy is in the form of broad guidelines and executive instructions and will be applicable to projects displacing 500 families or more in plain areas and 250 families or more in hilly areas.

The NPRR does not meet some of the International Funding Agencies (World Bank, ADB etc.) resettlement policy's key requirements. Firstly, the NPRR states that in acquisitions for highways, railway lines, transmission lines and pipelines, project affected families will be offered an ex-gratia payment of Rs 10,000 and no other resettlement and rehabilitation benefits. Secondly, the cut-off numbers of affected persons for whom World Bank requires resettlement plans are much lower. Thirdly, replacement value is not clearly defined and more

importantly is not taken into account in the various lump-sum compensation payments that have been decreed in the policy. Fourthly, no specific entitlements have been provided for untitled persons such as squatters and encroachers. However, the policy does recognize some significant principles. It requires projects to (a) minimize displacement and to identify non-displacing or least-displacing alternatives; (b) plan the resettlement and rehabilitation of PAPs including special needs of tribal and vulnerable sections; (c) provide a better standard of living to PAFs; and (d) facilitate harmonious relationships between the requiring body and PAFs through mutual cooperation. A National Monitoring Committee will be set up comprising the Secretary Land Resources (Chair), Secretary Planning Commission, Secretary Social Justice and, Secretary Water Resources, Secretary Tribal Affairs, Secretary Railways, Secretary Power and Secretary Coal. In addition a National Monitoring Cell will be established in the Department of Land Resources in the Ministry of Rural Development under a Joint Secretary, assisted by zonal directors, subject matter specialists, deputy directors and other support staff.

In view of many deficiencies identified in NPRR, a new National Rehabilitation Policy has been formulated after reviewing the NPRR many times. The new NPRR has been cleared by the union cabinet very recently on 11th October 2007. The Government of India now plans to give the policy Statutory Status by amending Land Acquisition Act, 1894.

R & R under Current Project

Resettlement & Rehabilitation Framework for this project has been elaborated and subjected to the objectives and the scope of following guidelines and policies.

- National Policy on Resettlement & Rehabilitation 2007
- JICA Guidelines
- JBIC Guidelines
- World bank Safeguard Policies
- ADB Environmental Policies

Entitlement framework for this project has been recommended derived from specific project requirement identified by a baseline socio-economic census and exhaustive community consultation sessions. Considerable references were made to the earlier R&R experiences from the Railway project financed by ADB and other best-demonstrated practices in Gujarat and India.

Hindustan Times
epaper
Published on October 12 2007, Page 10

New policy to share fruits of growth with the land owners

Aloke Tikku and Satyen Mohapatra
New Delhi, October 11

THE GOVERNMENT on Thursday unveiled a new rehabilitation policy that intends to make the displacement of people for industrial growth a less painful experience.

Land in return for land for displaced families, preference in project jobs to at least a member of each family, vocational training, scholarships for children and housing benefits including houses to affected families in rural and urban areas are some of the benefits under this new policy. The policy and the amendments in land acquisition laws approved by the Cabinet on Thursday also make Social Impact Assessments of projects that affect more than 400 families in the plains (and 200 families in hilly areas) mandatory.

Furthermore, the policy requires the Centre to set up a National Rehabilitation Commission empowered to independently evaluate the satisfactory rehabilitation and resettlement of affected families. The concept of post-implementation social audits has also been made.

The policy was necessitated by violent protests in West Bengal, Maharashtra and Orissa by farmers who were displaced from their land for the setting up of factories and special economic zones. In light of this resentment, Congress president Sonia Gandhi had asked the government to frame a humane and equitable policy.

Information and Broadcasting Minister Priya Ranjan Dasmunsi said the new policy is aimed at striking a balance between the need for land for development and protecting the interests of land owners, tenants and others who depend on that property for livelihood. One way the policy strives to achieve this is by giving displaced people the right to share the fruits of industrial growth. "Entitled persons shall have the option of taking up to 20 per cent of their rehabilitation grant and compensation amount in the form of shares if the acquiring entity is a firm authorised to issue shares and debentures," he said.

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Highlights

REHABILITATION AND RESETTLEMENT POLICY, 2007

- National Rehabilitation Commission, ombudsman for grievance redressal and Rehabilitation and Resettlement Committee for each project
- Consultation with gram sabhas compulsory
- Social Impact Assessment for displacement of 400/200 families in plains/hill areas
- Tribal Development Plan for displacement of 200-plus tribal families
- If possible, land for land compensation and housing benefits for those who lose house
- Option for affected families to take 20%-50% compensation with government approval
- Preference in project jobs and one job per nuclear family, support for skill development
- Rs 500 monthly pension for destitute, widows, unmarried girls

LAND ACQUISITION AMENDMENT BILL, 2007

- Land can be acquired for public purpose. It also includes strategic purposes vital to the state and public infrastructure such as electricity, water supply. However, if land remains unutilised for five years, it will revert to government.
- Rate of compensation not to be less than floor price fixed by the state or average of higher prices paid in 50% of land sale cases.
- Persons with tenancy rights recognised entity for proportionate share in compensation.

2.3.8 Other Relevant Policies/Strategies

There are a number of other national policies to address various issues relating to the exploitation of natural resources and other environmental issues. The more relevant of these policies and their applicability to the project are provided in Table 2-8.

Table 2-8 Applicable GOI Policies to the DFC Project

Applicable GOI Policy	Year	Objective	Applicability
National Water Policy	2002	Conservation and management of water resources	Direct
Policy Statement on Abatement of Pollution	1992	National Policy on the Pollution control and prevention	Direct
National Conservation Strategy and Policy Statement on Environment And Development	1992	Strategy for development taking environmental concerns in to account in our development process	Direct
National Rehabilitation and Resettlement Policy	2003	All social issues relating to land acquisition, resettlement and rehabilitation	Direct
National River Conservation Plan(NRCP)	2001	For the conservation management of issues relating to rivers	Direct
National Lake Conservation Plan		For the conservation management of issues relating to Lakes	Direct
Wildlife Conservation Strategy	2002	For the conservation management of issues relating to Wildlife	Direct
National Biodiversity Strategy and Action Plan	2006	Developed in fulfillment of India's commitment to the Biodiversity Convention, it provides strategic directions and action plans for the sustainable management of biodiversity	Direct
National Wildlife Action Plan	1984	Addresses the need of conserving the nations biodiversity and emphasizes requirements of evolving prescriptions for management of multiple use areas which provide for wildlife habitat needs and forest products	Direct

Source: www.envfor.nic.in

CHAPTER 3 DESCRIPTION OF THE PROJECT

3.1 ALIGNMENT OF THE PROJECT

The project corridor for DFC in Haryana passes through two districts, namely, Mahendragarh and Rewari covering a total length of 76 km. The details of the alignment are given in **Table 3-1.**

Table 3-1 Description of Project Alignment in Haryana (km)

S.No	District	Parallel & Detour	Parallel	Detour
1	Mahendragarh	48	48	0
2	Rewari	28	20	8
Total		76	68	8

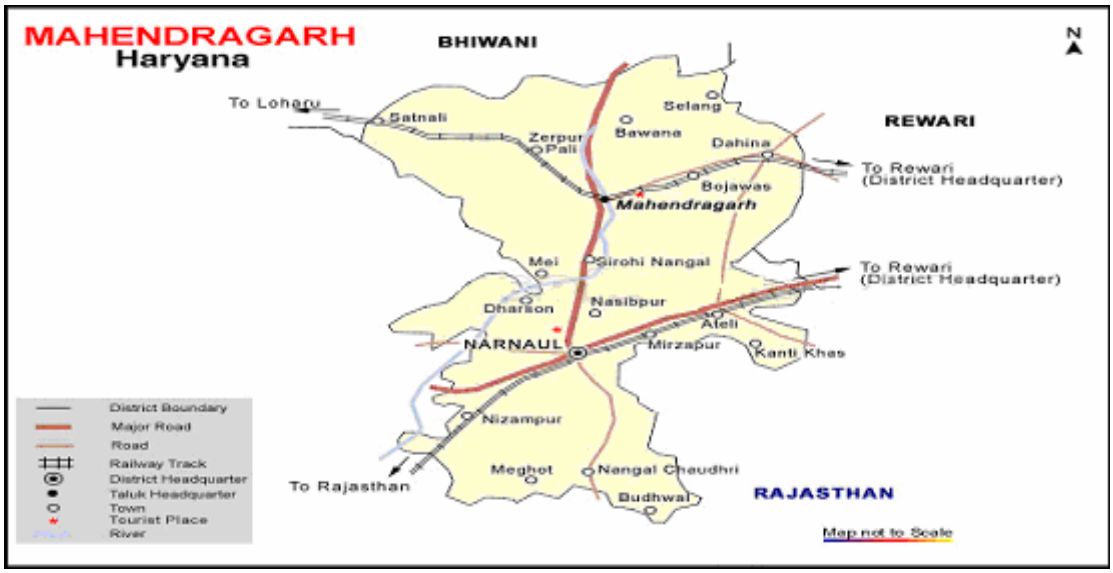
The alignment of the Western Corridor in Mahendragarh District starts from Nizampur Railway Station and ends at Ateli. The total length of the stretch is 48 km. The total numbers of villages falling in this stretch are 24. There is no town in this section corridor passing through Mahendragarh District. Only two tehsil in the project area i.e. Nangal, and Narnaul.

There are 5 railway stations in Mahendragarh District, namely, Nizampura, Mirzapur Bachod, Amerpura Jorsi Narnaul and Ateli.

The alignment in Rewari District starts from Kund Railway Station and ends at Rewari Junction. The total length of the stretch is 28 km (Table 3-1). The total numbers of villages falling in this stretch are 24. There is no town in this section corridor passing through Rewari District. Only two tehsils fall in the project area i.e. Rewari, Khol. 700 m of the alignment in Rewari District passes through forest area.

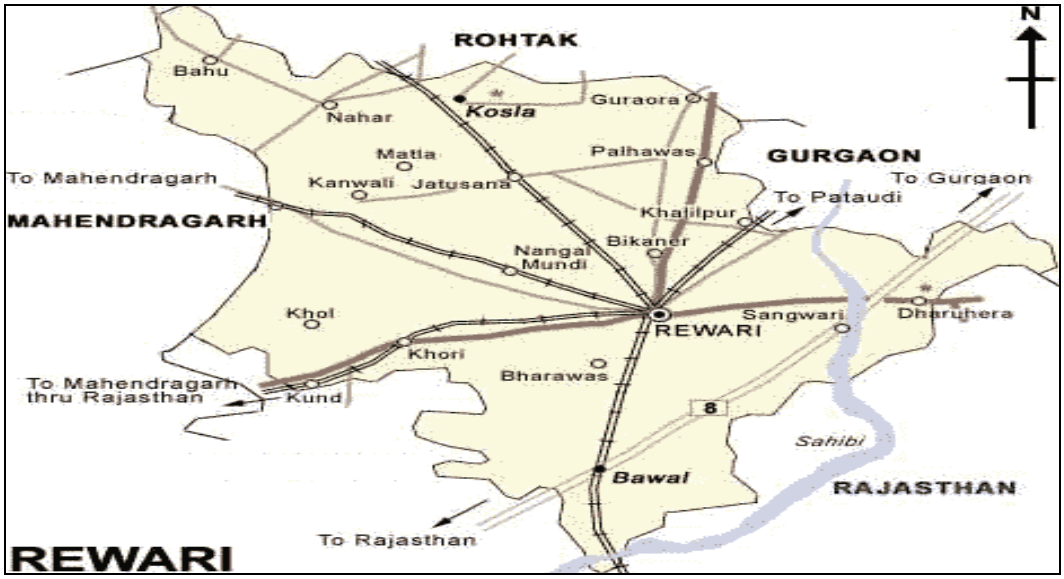
There are 3 railway stations in the district, Kund, Khori and Rewari.

The alignment in Rewari district passes through forest area for 700 m length.



Source: Maps of India

Figure 3-1 Alignment in the District Mahendragarh



Source: Maps of India

Figure 3-2 Alignment in Rewari District

3.2 PROJECT ACTIVITIES ENVISAGED

Dedicated Freight Corridor (DFC) Project's railway line will be constructed alongside the existing railway lines called as parallel section for maximum part of its stretch. In addition, various railway facilities planned to be constructed include mainly as below:

- Detours (by-passes) of DFC Project's railway lines avoiding urban centres alongside the existing railway lines
- Junction and crossing stations of approximately 60 m wide and 1600 m long each
- Major bridges crossing over important rivers as well as minor bridges
- Railway over Bridge (ROBs) and Railway under Bridge (RUBs) subject to construction

Project activities associated with construction of these main facilities are likely to cause significant environmental impacts in the vicinity of project sites. Main project activities subject to examination should be subdivided into three phases of the Project and are as follows:

1) Environmental Impacts during Pre-Construction (Planning & Design) stage
   - Land Acquisition
   - Resettlement and Rehabilitation
2) Environmental Impacts during Construction Phase

   i) Preparation Works

   - Materials and Equipment Transportation
   - Mobilization of Labour and Construction Equipment
   - Preparation of base camp, workshop, storage etc,
   - Identification of borrow areas and quarry sites
   - Clearance for forest land diversion
   - Planning and approval for Utilities shifting

- Resettlement and Rehabilitation (Continue)

ii) Implementation

- Site clearance and land preparation
- Excavation and filling
- Material transportation (quarry/borrow pit activities)
- Earth works followed by rail, electric line and signal installation works
- Crossing/Junction station works
- Demobilization and site restoration

3) Environmental Impacts during Post-construction (Operation) Stage

- Operation and maintenance of trains, railways, ROBs/RUBs and bridges

3.3 FACILITY CONSTRUCTION PLAN

The DFC will entail construction of the Railway alignment with associated facilities. The alignment has been selected judiciously considering environmental and social aspects. Detours are proposed to avoid the congested cities so that land acquisition and Project Affected Persons (PAPs) are minimized. The other features of alignment include construction of junction stations, crossing stations and service lanes.

3.3.1 Junction Stations

No junction station is located in the stretch of Mahendragarh.

In Rewari district one junction station located in the stretch of Rewari and another near Thothwalka village are proposed. The dimension of the junction is approximately 60 m x 2,130 m.

List of the stations falling in the existing alignment in Haryana is given in Table 3-2.

Table 3-2 List of stations along the existing alignment in Haryana

S. No.	Name of Station
1	Nizampura
2	Amarpur Jorasi
3	Mirzapur Bachnod
4	Tajpur
5	Ateli
6	Kund
7	Khari
8	Riwari

3.3.2 Crossing Stations

In Mahendragarh district there is one crossing station i.e. Mirzapur station located 1,269 km from the terminal point (JNPT Station). The dimension of the crossing stations will be 60 m x 1,600 m.

In Rewari District the crossing station i.e. Kund station located 1,291 km from the terminal point (JNPT Station). The dimension of the crossing stations will be 60 m x 1,600 m.

3.3.3 Detours

There is no detour in Mahendragarh District.

There is detour in the section passing through Rewari District. Detour section of 8 Km length is planned on western side near Dhoki village, bypassing the Rewari town which meets the existing line near Hari Nagar.

The salient features of the detour sections are:

- The width of detour section is 43.5 m excluding the drainage portion.
- RUB will be provided at every road
- Pedestrian footpath will be provided for approx. every 1 km for the local needs.
- 4 m wide service road will be provided on both side of the detour route

Typical section of detour is attached as Annex-3.1

3.3.4 Railway Over Bridge (ROB) & Railway Under Bridge (RUB)

There is no ROB and RUB in the Western Corridor Section passing through Mahendragarh and Rewari Districts.

3.3.5 Bridges

There is no major bridge in the Western Corridor section passing through Mahendragarh and Rewari Districts.

CHAPTER 4 EXISTING ENVIRONMENT

4.1 GENERAL

Haryana is situated in the north between 270 37' & 30035' latitude and between 740 28' and 770 36' longitude. Haryana has Uttar Pradesh (UP) on its eastern border, Punjab on its western border, Uttaranchal, Himachal Pradesh & Shivalik Hills on its northern border and Delhi, Rajasthan and Aravali Hills on its southern border. The altitude of Haryana varies from 700 ft to 900 ft above the mean sea level. An area of 1,553 sq km is covered by forest. Haryana has four main geographical features. There are total 20 districts in Haryana, and out of which two fall in the DFC alignment.

Rewari was accorded the status of a district by the Government of Haryana on 1st November, 1989. Its geographical boundaries have Rohtak district in its north, Mahendragarh district in west and district Gurgaon in east & north-east directions. District Alwar of Rajasthan touches Rewari in the south-east. Prior to it, Rewari was a Sub-division and Tehsil head quarter of district Mahendragarh.

Rewari is located at 82 km milestone in the south-west direction of the national capital Delhi across the Delhi Jaipur National Highway No.8. Rewari town is situated at an altitude of 242 m above mean sea level.

Mahendergarh district in the west. Spread-over an area of about 1,859 km^2 this district is situated between 27.52- 28.50 N latitude and between 76.0 to 76.5 eastern longitudes.

4.2 APPROACH AND METHODOLOGY

The approach of the study involved review of secondary data and primary survey of the project area. The secondary data was used to compile the regional features whereas the primary data was used to describe project influence area. The study consisted of reviewing topography, geology, soil, groundwater, hydrology, landscape, flora and fauna of the project area. The primary survey was followed by consultation with local people to obtain the relevant information about the area.

The standard quadrate method with random sampling approach was used to characterize the vegetation of the forest area under the project. Quadrate size 10 x 10 m was used for the flora study.

(1) Flora Assessment Techniques

The density measurements reflect as to how many individuals were present, the dominance measurements denote which specie is largest in terms of its presence and frequency measurements indicate how widely species are distributed among the same plots. Importance value is a reasonable measure to assess the overall significance of a species since it takes into account several properties of the species in the vegetation. Importance value index will be calculated as per Curtes & Mc Intosh (1950).

(i) Importance Value Index

$$\text{Density} = \frac{\text{Number of species A}}{\text{Area sampled}}$$

$$\text{Frequency} = \frac{\text{Number of plots in which species A occurs}}{\text{Total no. of plots sampled}}$$

$$\text{Dominance} = \frac{\text{Total cover or basal area of species A}}{\text{Area sampled}}$$

$$\text{Abundance} = \frac{\text{Total number of individuals of the species in all quadrats}}{\text{Total number of quadrats in which the species occurred}}$$

$$\text{Relative Density} = \frac{\text{Density of species A X 100}}{\text{Total density of all species}}$$

$$\text{Relative Frequency} = \frac{\text{Frequency value for species A X 100}}{\text{Total of all frequency values for all Species}}$$

$$\text{Relative Dominance} = \frac{\text{Dominance for species A X 100}}{\text{Total Dominance of all species}}$$

Importance Value Index = (Relative Density + Relative Dominance+ Relative Frequency)

(ii) $$\text{Similarity Index} = \frac{\text{2 x no. of common species X 100}}{\text{Total number of species in both the associations}}$$

(iii) Shannon – Weaver Index (1948)

The number of species and number of individuals in a community is measure of species diversity, which depends on stability of the habitat. Vegetation of the study area was assess by determining Shannon – Weaver diversity index, D (1948)

$D = \Sigma (ni / n) \log_2 (ni / n)$
ni = Number of individuals of each species in the sample
n = Total number of individuals

(2) Field Interview

During the survey, field interview was conducted in the project area to know about various aspects of forest studies. Information about uses of various plant species by local people as well as sighting of any wildlife species; uses, poaching etc. were obtained. The questionnaire used for environmental survey is attached as Annex-4.1.

4.3 TOPOGRAPHY

Based on the soil, physiography, bioclimate, and length of growing period, the state of Haryana has been divided into 8 agro-ecological zones (NBBS&LUP, 1989). Rewari district along with Gurgaon and Mahendragarh, falls in Zone 3. The topography of the district is represented by rugged hilly terrain of Aravalli ranges. The region has suffered a prolonged period of aridity during the quaternary and sub-recent times and the landscape has been

greatly modified by Aeolian action. The effect of fluvial cycle in developing the landform is also pronounced. The landscape of the district is peculiar. It has varied topography comprising of valleys, undulating lands, sand dunes and alluvial plains. The Aravalli ranges lie in the southern and western parts of the district and thinly spread throughout the district. The region has suffered a prolonged period of aridity during the quaternary and sub-recent times and the landscape has been greatly modified by Aeolian action. The effect of fluvial cycle in developing the landform is also pronounced. The catchment areas of Sahibi River, falling, in Rewari district can be divided into five distinct landscapes:

a) Aravalli Hills
b) Flood Plains
c) Foot Hills
d) Aeolian Plains and Sand Dunes
e) Alluvium Deposits

4.4 GEOLOGY

Rewari and Mehanragarh districts fall in the geological domain of Pre-Cambrian rocks of Aravalli Mountains. These are represented by Delhi Super Group of rocks (2500-1600 million years), which are confined to the southern part of the state of Haryana. It consists of Alwar group of rocks, overlain by rocks of Ajebgarh group. The Ajebgarh group of rocks is mostly developed in the form of hill ranges as well as parallel isolated hillocks in parts of Rewari. The dominant rock types of the group include shale, slate, phyllite, pelitic schist, crystalline and impure limestones, marbles, calc-schist with intercalations of thinly bedded quartzites.

4.5 SOIL

The district of Rewari is characterized by the soils belonging to two moisture regimes, i.e., Ustic (6.7%) and Aridic (1.4%). Dominant soils of Ustic zone are deep, excessively drained, sandy and alkaline classified as Typic Ustipsamments and associated soils as Typic Ustochrepts. Soils of Aridic zone are sandy and alkaline and classified as Typic Torripsamments and associated soils and Typic Camborthids.

The area is entirely covered by alluvial deposits, which consist of clay and sand with Kankar. Locally beds of gravel and cemented sands are occasionally present with the unconsolidated sands. The soils are alkaline in nature. The soils are deficient in nitrogen and organic matter. Within the alluvial tract occur the saline and alkaline soils.

4.6 CLIMATE

The climate is hot and semi-arid with annual rainfall about 300-500mm and growing period of less than 90-120 days. (Resources Atlas of Haryana:2004) with extremes of temperature in summer and winter. Hot and Dry winds laden with sand particles during summer are the common feature. Generally, bright sunshine, scarcity and variability of rainfall and very high rate of evapo-transpiration are the dominant climatic factors and it has been suffering from recurrent drought and famine conditions. The dominant components of the climate are as under.

The temperature starts rising from 29^0 C in March to 37^0 C in June and maximum temperature during summer season, in daytime, reaches up to 46^0 C whereas the minimum temperature during night is 17^0C to 20^0 C. In the winter season, the lowest temperature comes down to 0-2^0 C in the month of January and highest during the same period is up to 20^0 C, whereas, the mean temperature is 10^0 C. Thus, the exposed crop plants suffer from frost. The high

temperature coupled with high wind velocity and lack of soil moisture constitutes the main characteristics of the area.

The rainfall pattern is very erratic and precipitation received is also low. The rainfall is of monsoon type and sets in the last week of July and lasts upto 15th of September. About 70 % to 80% of the total annual rainfall is received during the monsoon period. During the winter season some rainfall is also received, which is not sufficient to meet the water requirement of Rabi crop. Irrigation is, therefore, essential to raise good Rabi crops. Uncertain and irregular rains cause drought in 3 years out of 10 years and drought like conditions in another 4 years.

4.7 LAND USE

Nearly 86% area of the geographical area is cultivable, out of which 93% is cultivated. The extent of current fallow (13,946 ha) is very high. Major crops grown in Rabi seasons are Mustard, Wheat, and Barley and, Bajra, Guar and Jowar are grown in Kharif season. However, a large area remains unsown during Kharif season due to less availability of water. Land use profile in the district is given below:

Table 4-1 Land use Profile in the Rewari District

S. No.	Particulars	Area (ha)
1	Geographical Area	150,678
2	Area Under Forests	1,906
3	Barren & Uncultivable Land	4,068
4	Agriculture Waste Land	1,096
5	Current Fallow	13,946
6	Total Cultivable Area	129,103
7	Cultivated Area	120,616
8	Net Area Sown	115,157
9	Net Irrigated Area	112,045
10	Canal Irrigated Area	1,327
11	Tube Well Irrigated Area	110,718
12	Cropping Intensity	148

Source: District Development Plan, Rewari.

About 85% of the total geographical area of district is occupied by agricultural lands of which double crop area covers 653 km^2 (44%) and Rabi in 196.71km^2 area (13%) suggesting availability of adequate water for irrigation. The Kharif crop occupies 25% of total geographical area of district. The fallow land occupies only 7% whereas agricultural plantation is only 1% of the total area. The occurrence of 7% fallow land is appreciable considering the good irrigation facilities and types of soils, which are non-calcareous and well drained. The principal crops in the district are wheat, rice, sugarcane and barley, which is grown in irrigated areas whereas maize, groundnut, bajra and pulses are the main Kharif crops.

4.8 WATER BODIES

River system

Rewari and Mahendragarh districts are covered under inland drainage basin .The Aravalli hill ranges occupying the southern margins of Haryana bring a number of small rainy streams from Rajasthan into this district. Among these streams Sahibi and Krishnawati are the major ones. There is general absence of canals in the study area. The topography of the district is such that did not permit under gravity canal commands. To overcome this, a lift canal system was developed. Rewari district falls in the Sahibi Watershed. Sahibi is a seasonal river passing

through the district. It enters the district from near Pavati Village in the south and then re-enters near Bhatsana and crosses over to Gurgaon district from near Meerpur Village. The seasonal river Krishnawati enters the district from Dhani Thethrabad and spread over Dahina-Zainabad Villages. One of the seasonal drain enters the district from Dhani Ahir Village to Majra Village and finds its way towards Mundi-Nangal Villages passing through Pali, Gothra, Mamria Thethar, Mamria Ahir, Mamria, Assampur Villages.

Ground water

Rewari is divided into five ground quality zones so far as quality of ground water is concerned, i.e., Fresh Ground water, Marginal ground water, shallow fresh deep/marginal, Shallow marginal / deep fresh, and shallow marginal /deep saline. Fresh water zones are found in the southern eastern parts of district is due to the presence of Aravali hills, which act as ground water recharging zones. Major zones of marginal ground water are found in Rewari district. The shallow marginal – deep fresh zones are associated with fresh water. Shallow saline and Deep/marginal zones are found at a few places in the northern –western fringes of the district. Rewari is among the districts where the ground water exploitation is the highest, resulting in ground water decline. Construction of embankments by the Rajasthan government in the Aravali hills has further aggravated the situation in the district. To overcome this serious problem, better ground water management with conjunctive use of surface and ground water is essential to supplement irrigation and domestic supplies.

4.9 NATURAL ENVIRONMENT

The forest in Rewari District comes under Mahendragarh division. Forests grow in Mahendragarh Forest Division comprising of two districts; Mahendragarh and Rewari. These districts lie between 28^0 27' 30" & 27^0 50' N Latitude and 75^0 58' to 76^0 50'E. Longitude covers a total area of about 321422.70 ha. It is located in the south western part of Haryana bordering Alwar district of Rajasthan in South, Sikar in the southeast, Jaipur in the West, Bhiwani district of Haryana in the North and Gurgaon in the East. There are five ranges in Mahendragarh Forest Division, namely Mahendragarh. Narnaul is in Mahendragarh District and Rewari, Nahar, Bawal in Rewari District. It is covered by following survey sheets.

The list of strip and block forests included in this working plan is given in below:

List of Strip and Block Forests

Name of division	Scale	No. of survey sheets
Mahendergarh (Including Rewari)	1:60,000	44/15,16
	(1" = 1 mile)	45 m/13 53D/3,4,5,6,7,8,9,10 11,12,15,16 54 A/1,9

(1) Distribution of the Area

Most of the area is situated along strips. Strip forest is situated along railway lines, roads, canals. Area under various categories of strip forest in the Division is 5873.58 ha.

There are 18 block reserve forests namely Salimabad, Nimbi, Duloth, Khairoli, Gadania, Sohla, Budin, Nangal Mala, Nawan, Digrota, Jatwas, Bassai, Narnaul, Kanti, Rasulpur, Nahar, Jhabua & Mukundpura and are declared as Reserve Forests vide various notifications of Govt. of Haryana. Total area of these reserve forests is 2160.68 ha. Detail data are described in Annexure- 5 and 5a.

Reserve Forest

The reserve forests are free from all kinds of rights and no one has any claim or right in any part of the forests or forest produce.

(2) Protected Forests

These are also free from all kinds of rights.

Between Khori and Kund Station-There are many patches of open forest in western side of the DFC line. But near Meli approximate 750 m. DFC line passing from open forest area in eastern side and some reserved forest like Kanti Reserve Forest are approximant 4 Km. away from DFC line in same direction.

Between Pali and Khori Station- Protected forest area is located at the approximate 300m away from DFC line in western side.

Between Rewari Junction and Pali Station-Some patch of open forests area are located at distance of 3 to 6 km away from DFC line in eastern side

Between Mirzapur bhachod and Nizampura Station- open forest areas are located in western side at approximate distance 3 to 6 km away from DFC Line.

4.9.1 Flora

The xerophytic type of flora dominates in these districts. The districts are inadequately wooded and some parts are practically bare of trees. Tree species found are khairi, jand, pahari kikar, kikar, dhok, babool, rohera, janti or reru, jai or van, beri, barh, pipal, lasura, imli, barna, shisham, siris, neem, farash, henna, papri, gular, indokh, tut, gulmohar, simbal or samul, kandu, bakain, safeda, arind and dhak. Kikar or pahari kikar is found all over the district. Farash is common in Rewari tahsil. Jand and jai are the dominant species of the sandy areas.

Shrubs found in the district are pala, hins, Puthkanda, bansa, panwar, karia, khip, Aak, phog and Nagphani. Amarbel is a common parasite climber. One of the most characteristic shrubs is pala, a prickly shrub, which covers the fields thickly during September and October. It is very useful shrub; its leaves are used as fodder; its fruits are eaten; its throny bushes are used for hedges or as fuel and its roots for dyeing leather. Nagphani forms thick hedge round many villages in tahsil.

Medicinal plants found in the district and indirain, asgandha, glo, kharnthi, bhakra and dhatura. However, their collection becomes uneconomical as these are found in scattered form.

The important grasses found in the district are anjan, dhaman, dub, kana, dabh palwa and chirya. The palatable grasses like anjan, dhaman and dub have dwindled due to excessive grazing in village common land.

Jand, neem bakain, khairi, mesquite or pahari kikkar, henna and eucalyptus have been planted to increase the forest wealth

The major species of trees found in the district are given in Table 4-2.

Table 4-2 Flora of Rewari and Mahendragarh

Local Name	Botanical Name
Khairi	*Acacia senegal Willd*
Jand	*Prosopis cineraria (L.) (Druce)*

Local Name	Botanical Name
Dhok	*Anogeissus latifolius (Roxb.)*
Babool	*Acacia jaoguemontil Benth*
Rohera	*Tacomella undulata (Sm.) Seem*
Janti or Reru	*Acacia leucophloea Willd*
Jal or Van	*Salvedora oleoides. Decne*
Beri	*Ziziphus mauritiana (Lamk)*
Barh	*Ficus bengalensis (L.)*
Pipal	*Ficus religiosa (L.)*
Lasura	*Cordia dichotoma. (Forst)*
Imli	*Tamarindus indica.L.*
Barna	*Crateva nurvala Buch.-Ham.*
Shisham	*Dalbergia sissoo Roxb.*
Siris	*Albizia Lebbeck (L.) Benth*
Neem	*Azadirachta indica Juss. Syn.-Melia azadirachta L.*
Farash	*Tamarix aphylla (L.) Karst*
Henna	*Acacia tortilis. L.*
Papri	*Pongamia pinnata (L.) Pierre*
Gular	*Ficus racemosa L.*
Indolkh	*Anogeissus Coronate Staff*
Tut	*Morus alba L.*
Gulmohar	*Delonix regia (Boj.) Raf.*
Simbal or Samul	*Bombax ceiba L.*
Kandu	*Diospyros melanoxylon Roxb.*
Bakain	*Melis azedaraeh L.*
Safeda	*Eucalyptus*
Arind	*Recinus communies*
Dhak	*Butea monosperama (Lamk.) Taub.*
Kikar Acacia nilotica (L.) Willd. Ex. Del. Subsp. Indica (Benth) Brenan syn.	*Pahari Kikar Prosopis juliflora (Sw.) DC.*
Shrubs	*Pala Zizyphus numnularia*
Hins Capparis sepiara L. Carissa spinarum L.	*Puthkanda Achyranthes aspera L.*
Bansa Adhatoda vasiea Nees.	*Panwar i Cassia tora L.*
	ii Cassia occidentalis L.
Karir Capparis decidua (Forsk.) Edgew	*Khip Leptadenia pyrotechnica (Forsk.) Decme. Decne. Syn. L. Spartium Wight*
Kikar Acacia nilotica (L.) Willd. Ex. Del. Subsp. Indica (Benth) Brenan syn.	*Pahari Kikar Prosopis juliflora (Sw.) DC.*
Shrubs	*Pala Zizyphus numnularia*
Hins Capparis sepiara L. Carissa spinarum L.	*Puthkanda Achyranthes aspera L.*
Bansa Adhatoda vasiea Nees.	*Panwar i Cassia tora L.*
Ak	*Calotropis procera (Ait). Ait. f.*
Phog	*Calligonum polygonoides L.*
Nagphani	*Cactus indicus*
Medicinal Plants	
Indirain	*Citrullus colocynthis (L.) Schrad*
Asgandha	*Withania somnifera (L.) Dunal*
Glo	*Timospera cordifolia Miera ex. Hook. F. & T, Thoms*
Kharnthi	*Sida acuta Burm f.*
Bhakra	*Tribulus terrestris L.*
Dhatura	*Datura stramonium L.*
Grasses	
Anjan	*Cenchrus ciliaris L.*

Local Name	Botanical Name
Dhaman	*Cenchrus setigerus Vahl*
Dub	*Cynodon dactylon (I.) Pers.*
Kana	*Saccharum bengalense Retz. Syn. Erianthus munja (Jroxb.) Jesw.*
Dabh	*Desmostachya bipinnata (L.) Stapf.*
Pala	*Dichanthi Annulatum (Forest.) Stapf.*
Chirya	*Heteropogon contortus (L.) Beauv*

Note; Detailed List are available in Annex 4.2
Source: Field visit June, 2007

The land along the railway line comes under the jurisdiction of Railway Ministry. As per the Indian Forest Act -29 (subsection 4.12) the forestland along the railway line falls under protected forest. The land along railway line is not transferred to Forest Department but Forest Department Clearance for cutting trees along railway line in Rewari District is required. But prior permission needs to be taken from Railway Department.

Near Parla [76^{0}22'N- 28^{0}08'E]- In eastern direction along the railway track, Approx. 0.7 km and approx. 0.7 km. distance from track.

Figure 4-1 Crossing No.18 C- Kund Behrod Crossing

Table 4-3 Importance Value Index of Palra Forest

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Prosopis cineraria	40.00	2.00	5.00	26.67	45.45	30.41	102.54	0.16	0.60	9.0
Ziziphus jujuba	20.00	0.30	1.50	13.33	6.82	1.14	21.29	0.08	0.50	5.0
Terminalia arjuna	30.00	0.70	2.33	20.00	15.91	42.58	78.49	0.15	2.00	9.0
Dalbergia sisoo	10.00	0.10	1.00	6.67	2.27	1.53	10.47	0.05	1.00	12.0
Azadirachta indica	20.00	0.60	3.00	13.33	13.64	9.12	36.09	0.11	1.00	11.0
Acacia catechu	20.00	0.60	3.00	13.33	13.64	9.12	36.09	0.11	1.00	8.0
Madhuca indica	10.00	0.10	1.00	6.67	2.27	6.08	15.02	0.07	2.00	10.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section mostly Private and agricultural land along the railway track. Prosopis and Acacia are the dominant species of this section. The average height and DBH are varying in between 5 to 12 Ft and 0.5 to 2Ft. Other commonly plant species *are Acacia* spp, *Prosopis* spp and *Eucalyptus* spp.

Mandwaria Crossing [76^{0}32'N- 28^{0}11'E]- In eastern direction along the railway track, Approx. 0.2 km and approx. 1.0 km. distance from track.

Figure 4-2 Crossing No-11-C, Mamadiya Crossing

Table 4-4 Importance Value Index of Mamadiya Crossing

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Prosopis spicegera	60.00	0.90	1.50	46.15	47.37	35.28	128.80	0.16	1.00	8.00
Ziziphus jujuba	10.00	0.10	1.00	7.69	5.26	1.00	13.95	0.06	0.50	7.00
Butea monosperma	30.00	0.60	2.00	23.08	31.58	23.50	78.16	0.15	1.00	11.00
Diospyros melanoxylon	10.00	0.10	1.00	7.69	5.26	35.28	48.23	0.13	3.00	12.00
Acacia arabica	10.00	0.10	1.00	7.69	5.26	3.94	16.90	0.07	1.00	9.00
Albizzia leebeck	10.00	0.10	1.00	7.69	5.26	1.00	13.95	0.06	0.50	10.00

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

Prosopis and *Acacia* are the dominant species of this section. The average height and DBH are varying in between 7 to 12 Ft and 0.5 to 3 Ft. Other commonly plant species are *Acacia* spp., *Prosopis* spp. and *Eucalyptus* spp.

Near Bhagwat Bhati [$76^0$35'N- $28^0$11'E] In western direction along the railway track, Approx. 0.5 km and approx. 0.3 km. distance from track.

Figure 4-3 Near Bhagwat Bhati

Table 4-5 Importance Value Index of Bhagwat Bhati

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Madhuca indica	30.00	0.40	1.33	4.23	2.27	10.82	17.32	0.07	2.00	9.0
Anogeisuss latifolia	90.00	5.50	6.11	12.68	31.25	5.96	49.88	0.13	0.40	12.0
Dendroclamus strictus	30.00	0.60	2.00	4.23	3.41	0.16	7.80	0.04	0.20	9.0
Hymenodictyon excelsum	30.00	0.30	1.00	4.23	1.70	0.51	6.44	0.04	0.50	24.0
Terminalia bellerica	20.00	0.30	1.50	2.82	1.70	8.12	12.64	0.06	2.00	9.0
Schlecher oleasa	70.00	1.20	1.71	9.86	6.82	32.47	49.15	0.13	2.00	8.0
Chloroxylon swietenia	60.00	2.10	3.50	8.45	11.93	14.21	34.59	0.11	1.00	10.0
Sterculia urens	10.00	0.20	2.00	1.41	1.14	5.41	7.96	0.04	2.00	9.0
Anogeissus latifolia	20.00	0.60	3.00	2.82	3.41	1.02	7.24	0.04	0.50	7.0
Holarrhena antidysenterica	50.00	1.00	2.00	7.04	5.68	1.69	14.41	0.06	0.50	8.0
Pterocarpus marsupium	90.00	1.20	1.33	12.68	6.82	2.03	21.53	0.08	0.50	7.0
Lagerstroemia parviflora	30.00	0.30	1.00	4.23	1.70	2.03	7.96	0.04	1.00	6.0
Alangium salviifolium	40.00	1.10	2.75	5.63	6.25	7.45	19.33	0.08	1.00	9.0
Diospyros melanoxylon	30.00	1.10	3.67	4.23	6.25	1.86	12.34	0.06	0.50	10.0
Emblica officialanis	30.00	0.30	1.00	4.23	1.70	0.51	6.44	0.04	0.50	10.0
Buchanania lanzan	40.00	0.70	1.75	5.63	3.98	4.74	14.35	0.06	1.00	11.0
Millettia auriculata	20.00	0.20	1.00	2.82	1.14	0.34	4.29	0.03	0.50	7.0
Aegle marmeloes	10.00	0.30	3.00	1.41	1.70	0.33	3.44	0.02	0.40	9.0
Sterculia urens	10.00	0.20	2.00	1.41	1.14	0.34	2.88	0.02	0.50	8.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section mostly scattered type trees are found there. Petrocarpus and ***Anogeisuss latifolia*** are the dominant species of this section. The average height and DBH are varying in between 7 to 24 Ft and 0.5 to 2Ft. Other commonly plant species *are Acacia* spp., *Prosopis* spp. and *Eucalyptus* spp.

Khor [76^{0}28'N- 28^{0}11'E] (Open Jungle Khor) In western direction along the railway track, Approx. 0.4 km and approx. 0.5 km. distance from track.

Figure 4-4 Near Khor

Table 4-6 Importance Value Index of Khor

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Lagerstroemia parviflora	40.00	0.70	1.75	7.84	6.67	3.44	17.95	0.07	0.50	12.0
Acacia nilotica	40.00	1.00	2.50	7.84	9.52	4.92	22.29	0.08	0.20	9.0
Diospyros exsculpta	20.00	0.20	1.00	3.92	1.90	3.94	9.77	0.05	1.00	8.0
Schorea robusta	40.00	0.50	1.25	7.84	4.76	9.86	22.47	0.08	1.00	10.0
Cleistanthus collinnus	60.00	1.60	2.67	11.76	15.24	1.25	28.26	0.10	0.50	7.0
Buchanaria lanzan	40.00	0.50	1.25	7.84	4.76	2.46	15.06	0.07	1.00	9.0
Madhuca indica	50.00	0.60	1.20	9.80	5.71	11.82	27.34	0.09	1.00	10.0
Anogeissus latifolia	30.00	0.30	1.00	5.88	2.86	23.64	32.38	0.10	1.00	11.0
Semecarpus anacardium	10.00	0.20	2.00	1.96	1.90	0.98	4.84	0.03	0.50	8.0
Careya arborea	10.00	0.10	1.00	1.96	0.95	1.98	4.90	0.03	1.00	7.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section mostly Private and agricultural land along the railway track. *Cleistanthus collinnus* is the dominant species of this section. The average height and DBH are varying in between 7 to 12 Ft and 0.5 to 1Ft. Other commonly plant species are *Acacia* spp., *Prosopis* spp. and *Eucalyptus* spp.

Open forest [$76^0$39'N- $28^0$15'E] In western direction along the railway track, Approx. 0.9 km and approx. 0.2 km. distance from track**.**

Figure 4-5 Forest Area

Table 4-7 Importance Value Index of Forest

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Madhuca indica	50.00	0.90	1.80	9.26	8.18	36.33	53.77	0.13	2.00	9.0
Syzygium cumini	50.00	0.50	1.00	9.26	4.55	20.18	33.99	0.11	2.00	11.0
Butea monosperma	10.00	0.10	1.00	1.85	0.91	1.02	3.78	0.02	1.00	6.0
Acacia Spp	60.00	1.10	1.83	11.11	10.00	11.11	32.22	0.10	1.00	12.0
Terminalia bellerica	20.00	0.20	1.00	3.70	1.82	18.16	23.69	0.09	3.00	5.0
Terminalia arjuna	10.00	0.20	2.00	1.85	1.82	2.02	5.69	0.03	1.00	7.0
Albizia leebeck	40.00	0.70	1.75	7.41	6.36	1.13	14.90	0.06	0.40	10.0
Careya arborea	10.00	0.10	1.00	1.85	0.91	0.26	3.02	0.02	0.50	12.0
Prospis juliflora	10.00	0.10	1.00	1.85	0.91	0.26	3.02	0.02	0.50	10.0
Buchanania lanzan	50.00	0.60	1.20	9.26	5.45	6.05	20.77	0.08	1.00	8.0
Zizypus Spp.	10.00	0.10	1.00	1.85	0.91	0.26	3.02	0.02	0.50	9.0
A.indica	60.00	1.60	2.67	11.11	14.55	0.64	26.30	0.09	0.20	14.0
Holarrhena antidysentrica	60.00	3.40	5.67	11.11	30.91	1.38	43.40	0.12	0.20	9.0
Diospyros exsculpta	30.00	0.50	1.67	5.56	4.55	0.21	10.31	0.05	0.20	12.0
Cleistanthus collinus	30.00	0.40	1.33	5.56	3.64	0.17	9.36	0.05	0.20	6.0
Semecarpus anacardium	10.00	0.10	1.00	1.85	0.91	0.04	2.80	0.02	0.20	10.0
Lagerstroemia parvifolia	10.00	0.10	1.00	1.85	0.91	0.04	2.80	0.02	0.20	11.0
Careya arborea	20.00	0.30	1.50	3.70	2.73	0.76	7.19	0.04	0.50	7.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section mostly Private and agricultural land along the railway track. Acacia is the dominant species of this section. The average height and DBH are varying in between 7 to 13 Ft and 0.5 to 3 Ft. Other commonly plant species are *Acacia* spp., *Prosopis* spp. and *Eucalyptus* spp.

In the field survey, maximum biodiversity index was found in H 5 (1.15) section and minimum was observed in H 2 (0.62) section near Prala. Mostly *Acacia*, *Prosopis* and *Zizypus* are dominant species.

Mirzapur-Bachhod [$76^0$12'N- $28^0$04'E] –In eastern direction along the railway track, Approx.1.5 km**.** Open forest is present there.

Figure 4-6 Crossing No 35-C (Mirzapur Bhachod Crossing)

Figure 4-7 Kaddipur Crossing

Table 4-8 Importance Value Index of Crossing No 35-C (Mirzapur Bhachod Crossing)

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Lagerstroemia parviflora	40.00	0.70	1.75	7.84	6.67	3.44	17.95	0.07	0.50	8.0
Prosopis Spp.	40.00	1.00	2.50	7.84	9.52	4.92	22.29	0.08	0.50	10.0
Diospyros exsculpta	20.00	0.20	1.00	3.92	1.90	3.94	9.77	0.05	1.00	8.0
Schorea robusta	40.00	0.50	1.25	7.84	4.76	9.86	22.47	0.08	1.00	9.0
Cleistanthus collinnus	60.00	1.60	2.67	11.76	15.24	1.25	28.26	0.10	0.20	12.0
Miliusa tomentosa	60.00	0.80	1.33	11.76	7.62	15.76	35.14	0.11	1.00	10.0
Acacia tortlis	10.00	0.10	1.00	1.96	0.95	0.50	3.42	0.02	0.50	14.0
Accia Nilotica	70.00	3.50	5.00	13.73	33.33	17.24	64.30	0.14	0.50	5.0
Terminalia tomentosa	20.00	0.30	1.50	3.92	2.86	0.23	7.00	0.04	0.20	9.0
Buchanaria lanzan	40.00	0.50	1.25	7.84	4.76	2.46	15.06	0.07	0.50	10.0
Madhuca indica	50.00	0.60	1.20	9.80	5.71	11.82	27.34	0.09	1.00	11.0
Anogeissus latifolia	30.00	0.30	1.00	5.88	2.86	23.64	32.38	0.10	2.00	7.0
Semecarpus anacardium	10.00	0.20	2.00	1.96	1.90	0.98	4.84	0.03	0.50	9.0
Albizia leebeck	10.00	0.10	1.00	1.96	0.95	1.98	4.90	0.03	1.00	13.0
Zizypus Spp.	10.00	0.10	1.00	1.96	0.95	1.98	4.90	0.03	1.00	8.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section *Acacia* and *Prosopis* are denominate species and trees are in scattered form. The average height and DBH are varying in between 8 to 14 Ft and 0.5 to 2Ft. Other commonly plant species *are Acacia* spp., *Prosopis* spp. and *Eucalyptus* spp.

Near Fatni [76^{0}14'N- 28^{0}05'E] –– In eastern direction along the railway track, Approx. 0.5 km**.** Open forest is present there.

Figure 4-8 32-C-Near Fatni Crossing

Figure 4-9 31-C, Near Tabda Crossing

Table 4-9 Importance Value Index of Near Fatni Crossing

Name of species	Frequency %	Density %	Abundance	Relative Frequency	Relative Density	Relative Dominance	Importance Value Index	Diversity Index	Avg.DBH (Ft.)	Avg. Height (Ft.)
Butea monosperma	50.00	2.60	5.20	35.71	63.41	9.77	108.90	0.16	0.50	10.0
Madhuca indica	30.00	0.60	2.00	21.43	14.63	36.09	72.15	0.15	2.00	13.0
Acisa Sp.	40.00	0.60	1.50	28.57	14.63	36.09	79.30	0.15	2.00	8.0
Azadirachta indica	10.00	0.10	1.00	7.14	2.44	6.02	15.60	0.07	2.00	10.0
Tamarindus indica	10.00	0.20	2.00	7.14	4.88	12.03	24.05	0.09	2.00	7.0

Note: F- Frequency, R.F- Relative Frequency, D- Density, AB- Abundance, RDO- Relative Dominance, IVI- Importance Value Index

In this section mostly Private and agricultural land along the railway track. Butea monosperma and Acacia are the dominant species of this section. The average height and DBH are varying in between 7 to 13 Ft and 0.5 to 2Ft. Other commonly plant species are *Acacia* spp, *Prosopis* spp and *Eucalyptus* spp.

In the field survey, maximum biodiversity index was found in (1.07) near Mirzapur Bachhod crossing section and minimum was observed in (0.62) section near Fatani Crossing. Mostly *Acacia*, *Prosopis* and *Zizypus* are dominant species.

4.9.2 Fauna

Due to scanty vegetation growth in this region not much of varied animal life is found in the district. Despite this still a large variety of animals are found in this area. The faunal life can be categorized as (i) Primates, (ii) Carnivores, (iii) Angulate, (iv) Rodents, (v) Lagomorpha, (vi) Insectivore and (vii) Crustivore. Corresponding to its varied topography and climate, the state has a wealth of animal life. Its avifauna is among the richest in the country.

Rodents:

Rats and other rodents generally cause damage to the roots of seedlings of *Acacia nilotica* and *Dalbergia sissoo* in nurseries and young plantations.

White ants: White ants are fairly destructive to young plants and cause severe damage to plantations during hot, September - October months.

Root grabs: This insect attacks the roots of *Acacia nilotica*, *Dalbergia sissoo* and *Ailanthus excelsa*.

Leaf defoliator: Attack of this insect is more pronounced during rainy season.

Locust: It is a migratory winged insect, which eats the leaves of plants and hence retards the growth of plants. Now its invasion in the area has been controlled.

The districts are inhabited by various groups of mammals. Primates are represented by rhesus macaque or bandar and the langur. The tiger and leopard, once abundant in the district are no more seen here. The carnivorous animals found in the district are the jungle cat, the small Indian civet, jackal and the Indian fox.

The insectivorous like the grey musk-shrew or chuchunder, common yellow bat and the Tichelli's bat are usually seen.

The five stripped palm squirrel or gilheri, the Indian porcupine or sahi, the Indian gerbile, the common house rat and mouse are common rodents found.

The Indian hare belonging to the order lagomorpha is also found in the bushes. Chinkara is seen in the district specially in Bawal tahsil and Nimbi Duloth and Nangal Mala forests in Mahendragarh tahsil. Black buck though in limited number is found near Rewari and Sureti, Dalanwas and Mahendragarh in Mahendragarh tahsil. The blue bull or Nilgai is common all over the district; though it damages the crops yet villagers protect the animal due to religious sentiments.

The species facing extinction in the district are chinkara, black buck, blue bull, stripped hyaena and bheriya.

Table 4-10 Fauna in Rewari and Mahendragarh Districts

Local Name	Scientific Name
Rhesus macaque or Bandar	*Macaca mulatta (Zimmermann)*
Common langur	*Presbytis entellus (Duffresne)*
Jungle cat	*Felis chaus Guldenstaedt*
Small Indian civet	*Viverricula indica (Desmarest)*
Common mongoose	*Herpestes edwardsi (Geoffroy)*
Jackal	*Canis aurius Linnaeus*
Indian fox	*Vulpes benghalensis (Shaw)*
Grey musk-shrew or Chuchunder	*Suncus murinus (Linnaeus)*
Common yellow bat	*Scotophilus heathi (Horsfield)*
Tickelli's bat	*Hesperoptenus tickllli (Blyth)*
Five stripped palm squirrel or gilheri.	*Funambulus pennanti (Wrought on)*
Indian porcupine or sahi	*Hystrix indica (Kerr)*
Indian gerbille	*Tatera indica (Hardwicke)*
Common house rat	*Rattus rattus (Linnaeus)*
Mouse	*Mus musculus (Linnaeus)*
Indian hare	*Lepus nigricollis (Cuvier)*
Chinkara	*Gazella gazella (Pallas)*
Blackbuck	*Antelope cervicapra (Linnaeus)*
Bluebull or nilgai	*Boselaphus Tragocamelus (Pallas)*
Spotbill duck	*Anas poecilorhyncha (Forster)*
Cotton teal	*Nettapus coromandelianus coromandelia- nus (Gmelin)*
Tree duck	*Dendrocygna Javanica (Horsfield)*
Dabchick	*Podiceps reficollis capensis (Salvadori)*
Eastern greylag goose	*Anser anser rubrirostris (Swindoe)*
Barheaded goose	*Anser indicus (Latham)*
Braminy duck	*Tadorna ferruginea (Pallas)*
Pintail	*Anas ecata*
Common teal	*Anas crecca crecca (Linnaeus)*
Mallard	*Anas platyrhynchos Linnaeus*

Local Name	Scientific Name
Gadwall	*Anas strepera strepera Linnaeus*
Wigeon	*Anas penelope Linnaeus*
Bluewinged teal	*Anas guerguedula Linnaeus*
Shoveller	*Anas clypeata Linnaeus*
Common pochard	*Anas ferina Linnaeus*
Ferruginous duck	*Anas nyroca (Guldenstadt.)*
Tufted duck	*Aythye fuligula (Linnaeus)*
Black partridge (State bird)	*Francolinus francolinus asiae (Bona-parte)*
Grey partridge	*Francolinus pondicerianus interpositus (Hartert)*
Grey quail	*Coturnix coturnix coturnix (Linnaeus)*
Blackbreasted or rain quail	*Coturnix coromandelica (Gmelin)*
Jungle bush quail	*Perdicula asisatica punjaubi (Whistler)*
Rock bush quail	*Perdicula argoondah (Sykes)*
Western turtle dove	*Streptopelia orientalis meena (Sykes)*
Indian spotted dove	*Streptopelia chinensis suratensis (Gemlin)*
Senegal dove	*Streptopelia senegalensis cambyensis (Gemlin.)*
Indian emerald dove	*Chalcophaps indica indica Linnaeus*
Indian sandgrouse	*Pterocles exustus erlangeri (Neumann)*
Black-bellied sandgrouse	*Pterocles orientalis orientalis Linnaeus*
Pintail sandgrouse	*Pterocles alchata caudacutus (Gmelin)*
Spotted sandgrouse	*Pterocles senegallus (Linnaeus)*
Large cormorant	*Phalacrocorax carbo sinensis (Shaw)*
Little cormorant	*Phalacrocorax nigar (Vieillot)*
Dater or snake bird	*Anhinga rufa melanogaster Pennant*
Eastern grey heron	*Ardea cinerea rectirostris Gould*
Paddy bird	*Ardeola grayii (Sykes)*
Eastern large egrets	*Egretta alba modesta (J.E. Grey)*
Median egret	*Egretta intermedia intermedia (Wagler)*
Little egret	*Egretta garzetta garzetta (Linnaeus)*
Little bittern	*Ixobrychus minutus minutus (Linnaeus)*
Cattle egret	*Bubulcus ibis coromandus (Boddaert)*
Eastern common crane	*Grus grus lilfordi Sharpe*
Demoiselle crane	*Anthropoides virgo (Linnaeus)*
Indian sarus crane	*Grus antigone antigone (Linnaeus)*
Painted stork	*Ibis leucocephalus (Pennant)*
Openbill stork	*Ananstomus oscitans (Boddaert)*
White ibis	*Threskiornis melanocephala (Latham)*
Blacknecked stork	*Xenorhynchus asiaticus asiaticus (Latham)*
Indian Black ibis	*Pseudibis papillosa papillosa (Temminck)*
Eastern Baillon's crake	*Porzana pusilla pusilla (Pallas)*
Spotted crake	*Porzana Porzana (Linnaeus)*
Slatylegged banded crake	*Rallina eurizonoides amauroptera (Jerson)*
Norther ruddy crake	*Amauronrnis fuscus bakeri (Hartert)*
White-breasted water hen	*Amaurornis phoenicurus chinensis*
Water cock	*Gallicrex cinerea cinerea (Gmelin)*
Indian moorhen	*Gallinula chloropus indica Blyth*
Coot	*Fulica atra atra Linnaeus*
Dusky Redshank	*Iringa erythropus (Pallas)*
Eastern Redshank	*Iringa totanus eurthinus (Oberholser)*
Marsh sandpiper	*Iringa stagnatilis (Bechstein)*
Green Shank	*Iringa Nebularia (Gunnerus)*
Green sandpiper	*Iringa ochropus Linnaeus*
Wood sandpiper	*Iringa glareola Linnaeus*
Common sandpiper	*Irniga hypoleucos Linnaeus*
Pintail snipe	*Capella stenura (Bonnaparte)*
Fantail snipe	*Capella galinago gallinago (Linnaeus)*

Local Name	Scientific Name
Temmincks stint	*Calidris temminchii (Leisler)*
Pheasant tailed Jacana	*Hydrophasisanus chiturgus (Scopoli)*
Painted snipe	*Rostratula benghalensis benghalensis*
Indian black-winged stilt	*Himantopus himantopus himantopus*
Indian river tern	*Sterna aurantis Grey*
Black-bellied tern	*Sterna acuticauda Grey*
Indian whistered tern	*Chlidonals hybrida indica (Stepehens)*
Indian pied kingfisher	*Ceryla rudis leucomelanura reichenbach*
Indian small blue kingfisher	*Alcedo atthis bengalensis Gmelin*
White-breasted kingfisher	*Haleyon smyrnensis smyrnensis (Linnaeus)*
Common peafowl	*Pavo cristatus Linnaeus*
Large Indian parakeet	*Psittacula eupatria (Linnaeus)*
Rose ringed parakeet	*Psittacula kramari borealis (Neumann)*
Indian house crow	*Corvus splendens splendens Viellot*
Indian house sparrow	*Passer domesticus indicus Jardive and*
Blue-cheeked bee-eater	*Merops superciliosus (Linnaeus)*
Golden backed woodpecker	*Dinopium benghalense benghalense*
Blue jay	*Corais benghalensis bengalensis*
Coppersmith	*Magaltma haemaoephala indica (Latham)*
Indian golden oriole	*Oriolus oriolus kundoo Sykes*
Pied crested cuckoo	*Clamator iacobinus serratus (Sparrman)*
Koel	*Eudynamys scolopacea scolopacea*
Common crow-pheasant	*Centropus sinensis sinensis (Stephens)*
Red-vented bulbul	*Pycnonotus cafer (Linnaeus)*
White-eared bulbul	*Pycnonotus leucogenys (Grey)*
Verditer flycatcher	*Muscicapa thalassina thalassina Swainson*
Indian magpie robin	*Copsychus svecicus svecicus (Linnaeus)*
Indian purple sunbird	*Nectarania asiatica asiatica (Latham)*
Red munia	*Estrilda amandava amandava (Linn.)*
Indian spotted munia	*Lonchura punctulata punctulata (Linn.)*
Crested bunting	*Melophws lathami (Gray)*
Hoopoe	*Upupa epops Linnaeus*
Indian White eye	*Zosterops paepebrosa paepebrosa*
Pariah kite	*Milvus migrans (Boddaert)*
Brahminy kite	*Haliastus indus indus*
Whitebacked vulture	*Gyps bengalensis (Gmelin)*
Tawny eagle	*Aguila rapa vinahiana Franklin*
White eyed buzzard-eagle	*Butastur teera (Franklin)*
Indian jungle crow	*Corvus macrorhynchos culminatus Sykes*
Indian scavenger vulture	*Neophron percnopterus givginianus*
Black-winged kite	*Elanus caeruleus vociferus (Latham)*
Indian shikra	*Accipiter badius dussumieri (Temminck)*
Lagger falcon	*Falco biarmicus (Temminck)*
Kestrel	*Ealco tinnunculus (Linnaeus)*
Pale Harrier	*Circus macrourus (Gmelin)*
Marsh harrier	*Circus aeruging sus aerugin ous (Linnaeus)*
Eastern steppe eagle	*Aguila nipalensis nipalensis (Hodgson)*
Spotted owlet	*Athena brama (Temminck)*
Eagle owl	*Bubo bubo (Linn.)*
Indian house swift	*Spus affinis affinis (J.E. Gray)*
Indian palm swift	*Cypsiurus parvus batasiensis (J.E. Grey)*
Western swallow	*Hirundo rustica rustica Linnaeus*
Indian wire-tailed swallow	*Hirundo smithi filifera Stephens*
King crow	*Dicrurus adsimilis albirictus (Hodgson)*
Brahminy myna	*Sturnus pagodarum (Gmelin)*
Indian pied myna	*Sturnus contra contra Linnaeus*

Local Name	Scientific Name
Indian myna	*Acridotheres tristis tristis (Linnaeus)*
Bank myna	*Acridotheres ginginianus (Latham)*
Rosy paster and starling	*Sturnus roseus Linnaeus*

Source: Field survey in 2007 and Secondary Data

Game birds – A large number of game birds are found in the district, some are residential while others are winter visitors. Various types of ducks such as spot-billed duck, cotton teal, comb duck, large whistling teal, tree duck and dabchick are found throughout the district at suitable habitats. Ducks and geese such as eastern grey-lag goose, bar-headed goose, brahminy duck, common shelduck, pintail, common teall, mallard, gadwali, wigeon, blue winged teal, shoveller, common pochard, ferrugious ducks and tufted duck visit the district during winter.

Other game birds like black partridges (the state bird) and grey partridges and quails are common. Grey quail is a winter visitor while black-breasted or rain quail, jungle bush quail, whistler or rock bush quail are resident species. Western turtle dove, Indian spotted dove, Senegal dove and Indian emerald dove are generally found in all cultivated fields.

Sandgrouses, namely, the Indian sandgrouse and black-bellied are resident birds while large pintail sandgrouse and spotted sandgrouse visit the district in winter. Their flocks, large and small, regularly visit favourable waterholes.

The district is also inhabited by large number of other birds which add beauty to the wildlife. Birds like large cormorant, little cormorant, darter or snake bird, eastern grey heron and paddy bird are found on the ponds and lakes of the district throughout the year. Other birds like eastern large egrets, median egret, little egret and little bittern affect inland water marshes, jheels, etc. Cattle egret can be seen moving along with grazing cattle.

Among cranes, eastern common crane and Demoiselle crane are found near stream beds and fields of winter crops. Indian sarus crane is a resident bird and breeds during rains.

A good number of painted stork, open bill stork, white-necked stork, black-necked stork, white ibis, and Indian blackibis are found near the streams, jheels, marshes, inundated lands and cultivated fields. It is common during rains.

During winter eastern Baillon's crake and spotted crake can be seen on the edges of ponds and lakes feeding on aquatic plants. Indian blue-breasted banded rail, slatylegged banded crake, northern ruddy crake, white-breasted water hen, water cock, Indian moorhen, Indian purple moorhen are resident birds and can be seen on ponds, inundated paddy fields, etc. Coot is a resident as well as winter visitor and affects jheels and tanks.

Different types of waders are also found. Waders like dusky redshank, eastern redshank, marsh sandpiper, green shank, green sandpiper, wood or spotted sandpiper, common sandpiper, pintail snipe, fantail snipe and temminck's stint visit suitable marshy areas and the edges of ponds during winter. Pheasant tailed jacana, painted snipe and Indian black-winged stilt are resident birds and affects jheels, marshes, tanks and ponds. Indian river tern and black-bellied tern are found in the stream beds throughout the year. Indian whistered tern is a winter visitor.

Among the kingfishers, the most common are the Indian pied kingfisher, Indian small blue kingfisher and white-breasted kingfisher. These birds can be seen hurling themselves into water to catch fish. These are residential birds.

The common peafowl, the national bird, is quite common and is seen in orchards, fields and gardens.

The other common birds are large Indian parakeet, rose-ringed parakeet, Indian house crow, Indian house sparrow, blue-checked bee-eater, golden-backed woodpecker, blue jay, coppersmith, Indian golden oriole, pied crested cuckoo, koel, common crow pheasant, red-vented bulbul, white-eared bulbul, verditer flycatcher, Indian magpie robin, Indian purple sunbird, red munia, Indian spotted munia and crested bunting. Besides, such attractive birds as hoopoe and Indian white-eye are also seen in and around villages.

Birds of Economic Importance – Scavengers like pariah kite, brahminy kite, white-backed vulture, tawny eagle, white-eyed buzzard eagle and Indian jungle crow keep the district cleared of dead animals by feeding on them. The Indian scavenger vulture, besides feeding on dead animals, consumes a large quantity of human excreta. Predators like black-winged kite, Indian shikara, lagger falcon and kestrel are residential birds of the district. Other birds like pale harrier, marsh harrier and eastern steppe eagle visit the district in winter. These along with spotted owlet and eagle owl keep a check on the population of rodent pests and various insect pests by consuming them.

Majority of the birds feed on insects and caterpillars injurious to agriculture. Swifts such as Indian house swift, Indian palm swift and swallows like western swallow and Indian wire-tailed swallow consume insects as their staple diet. Shrikes or butcher birds as they are popularly known, feed upon a considerable quantity of insects. Other insect eating birds are king crow, Brahminy myna, Indian pied myna, Indian myna, bank myna, babblers, warblers and flycatchers. Larks and wagtails feed on a considerable amount of worms in addition to insects. Rosy paster and common starling both winter visitors may specially be mentioned for their role in destroying numerous insects including locusts on a large scale and thus help in saving crops to some extent.

Fish

The streams and ponds abound in many species of fish. These are parri, katla, mrigal, bata, kalabans, rohu, puthia or kudali, or pitula, magur, singhara, ghally, mallee, dolla and curd.

Table 4-11 Fish Species Found in Rewari and Mahendragarh Districts

Local Name	Scientific Name
Parri	*Notopterus notoprerus (Pallas)*
Katla	*Catla catla (Hamilton)*
Mrigal	*Cirrhinus mrigala (Hamilton)*
Bata	*Labeo bata (Hamilton)*
Kalabans	*Labeo calbasu (hamilton)*
Rohu	*Labeo rohita (Hamilton)*
Puthia, Kudali or Pitula	*Puntius sarana (Hamilton) saraa*
Magur	*Clarias batrachus (Linnaeus)*
Singhara	*Aovichihys seenghala (Sykes)*
Ghally	*Ompok bimaculatus (Bloch)*
Mallee	*Wallago attu (Block & Schneider)*
Dolla	*Channa punctatus (Bloch)*
Curd	*Channa striatus (Bloth)*

Source: Field Survey 2007

Table 4-12 National Parks and Wildlife Sanctuaries

Name of State/UT/National Park (NP) Wildlife Sanctuary (WLS)	Years of Establishment	Area (Km^2)	District(s) Location	Distance from DFC Alignment KM	Location
Haryana					
Kalesar NP	2003	46.82	Yamuna Nagar	31.0	30°20'16.8"N, 77°22'44.4"E
Sultanpur NP	1989	1.43	Gurgaon	12.67	28°16'12 "N, 76°46'48"E
Nahar WLS	1987	2.11	Rewari	21.52	28°21'57.6"N, 76°23'27.6"E

Wild Life Sanctuary (WLS)- Nahar WLS exists in Rewari district. No wild life sanctuary exists along DFC line in Mahendragarh district.

Nahar Wild Life Sanctuary- Location of WLS is between 28^0 21'57.6'' N and 76^0 23'27. 6''E and is approximately 21.6 km from DFC project. There is no impact of proposed DFC on wild life sanctuary.

4.10 BASELINE SOCIO-ECONOMIC STATUS

4.10.1 General

The state of Haryana has an area of 44,212 km^2 and a population of 21.2 million (2001 census). There are 20 districts, 47 sub-division, 116 blocks and 6,759 villages. The state is divided into four administrative divisions (i) Ambala, (ii) Rohtak (iii) Gurgaon and (iv) Hisar.

The project corridor includes two districts, Rewari and Mahendergarh. A study was undertaken with respect to demography, occupational pattern, land holding, literacy rate and other important socio-economic indicators of two districts to reveal the socio-economic structure of the entire project area. This chapter elaborates the socio-economic profile of the Haryana State and entire project affected region covering two districts.

(1) Approach Adopted

Secondary Data: Socio-economic profile has been compiled from latest census data (Primary Census Abstract, 2001). Rewari, Mahendragarh District has taken into account in this chapter for detailed socio-economic analysis where tehsil has been taken as the minimum administrative unit. Socio-economic profile of project affected region and Haryana state has also been compiled to develop a comparative account.

(2) Administrative Set-up

1) Rewari

The administrative set-up of the existing corridor passes through Khol and Rewari CD blocks in Rewari District involving 24 villages. The profile of the administrative setup of the corridor area is shown in Table 4-13.

Table 4-13 Lists of Villages Falling in Project Corridor in District Rewari

S. No.	District Name	Name of Sub-district (Tehsil)	No. of Villages	Section
1	Rewari	Rewari	13	4 villages (detour) 9 villages (parallel)
		Khol	11	Parallel
Total number of affected villages			24	

Source: Primary Survey data

2) Mahendergarh

The administrative set-up of the existing corridor passes through Ateli Nangal and Narnaul CD blocks in Mahendragarh District; involving 24 villages. The profile of the administrative setup of the corridor area is shown in Table 4-14.

Table 4-14 List of Villages Falling in Project Corridor in District Mahendragarh

S. No.	District Name	Name of Sub-district (Tehsil)	No. of Villages	Section
1	Mahendragarh	Narnaul	23	Parallel section
		Mahendragarh	1	Parallel
Total number of affected villages			24	

Source: Primary Survey data

4.10.2 Demographic Features

The State has population of 21,082,989 (16) with population density of 478 /km^2. (as against the national average of 324). The decadal growth rate of the state is 28.4. (Against 21.5% for the country) and the population of the state continues to grow at a much faster rate than the national. The Total Fertility Rate of the State is 3.0. The Infant Mortality Rate is 60, and Maternal Mortality Ratio is 162 (SRS 2001 - 03), which are lower than the national average. The Sex Ratio in the State is 861 as compared to 933 for the country. Comparative figures of major health and demographic indicators are as shown Table 4-15.

Table 4-15 Demographic Profile of Haryana State as Compared to India Figures

S. No.	Item	Haryana	India
1	Total population (Census 2001) (in million)	21.1	1,028.6
2	Decadal Growth (Census 2001) (%)	28.8	21.5
3	Crude Birth Rate (SRS 2005)	24.3	23.8
4	Crude Death Rate (SRS 2005)	6.7	7.6
5	Total Fertility Rate (SRS 2004)	3.0	2.9
6	Infant Mortality Rate (SRS 2005)	60	58
7	Maternal Mortality Ratio (SRS 2001 - 2003)	517	301
8	Sex Ratio (Census 2001)	898	933
9	Population Density (Census 2001)	478	324

Source: Census 2001

It is necessary to make a comparative account between state, district and project affected region to get a clear idea about present status of concerned area. From developmental point of view, it is necessary to assess these things as minutely as possible to minimize the adverse impact on people. The demographic profile of Mahendergarh and Rewari area are shown in Table 4-15.

Table 4-16 Demographic Profile of Rewari District and Rewari Tehsil as Compared to Regional and State Figures

Area	Number of household	Total population	Population Density	Male Population	%of male Population	Female Population	% of female Population	Sex Ratio
AFFECTED TEHSIL OF REWARI DISTRICT								
Rewari	3,975	21,868	-	11,501	-	10,367	-	889
DISTRICT								
Rewari	702,670	765,351	483	403,034	52.66	362,317	47.33	899
REGION								
Project Affected Region	7,374	411,140	-	21,397	52.04	19,713	47.96	-
STATE								
Haryana	-	21,144,000	477	11,364,000	53.74	9,780,000	46.25	898

Source: Primary Census Abstract 2001

Rewari District has population of 765,351 as against the state population of 21,1 million. Rewari district contributes only 7.0% of the state population.

Sex ratio helps in identification of family status and vulnerable category. The sex ratios are almost consistent with slight variation in Rewari Tehsil (Table 4-16). Sex ratio of the district is almost similar to affected Tehsil.

Table 4-17 Demographic Profile of Mahendragarh District and Narnaul and Mahendragarh Tehsil as Compared to Regional and State Figures

Area	Number of household	Total population	Population Density	Male Population	%of male Population	Female Population	% of female Population	Sex Ratio
AFFECTED TEHSIL OF MAHENDRAGARH DISTRICT								
Narnaul	6,399	39,302	-	20,411	51.93	18,891	48.04	920
Mahendragarh	1,220	7,332	-	3,911	53.34	3,421	46.66	920
DISTRICT								
Mahendragarh	135,218	812,521	437	423,578	52.13	388,943	47.87	918
REGION								
Project Affected Region	232,817	1,356,231	394	711,336	52.44	644,895	47.56	-
STATE								
Haryana	3,712,319	21,144,564	477	11,363,953	53.74	9,780,611	46.25	898

Source: Primary Census Abstract 2001

Mahendragarh District has population of 812,521 as against the state population of 2114 million. Mahendragarh district contributes only 7.0% of the state population.

Sex ratio helps in identification of family status and vulnerable category. The sex ratios are almost consistent with slight variation in Mahendragarh Tehsil. Sex ratio of the district is almost similar to affected Tehsil.

4.10.3 Social Stratification

1) Rewari

To identify the vulnerable groups sequentially, it is important to identify the social groups. As far distribution of caste is concerned schedule caste population is 18.9% within Rewari District as against 19.3% in the state. In project-affected region it is also 18.9%. Schedule tribe population is almost non-existence in Haryana.

Table 4-18 Comparison of the Social Profile of Rewari

Area	SC Population nos.	SC Population %	ST Population nos.	ST Population %	Below Poverty Line Population	Below-Poverty Line Population %
AFFECTED TEHSIL OF REWARI DISTRICT						
Rewari	5,192	-	-	-	-	-
Khol	2,841	-	-	-	-	
DISTRICT						
Rewari	745,219	18.9	-	-	-	-
PROJECT AFFECTED REGION						
Includes one districts	745,219	18.9	-	-	-	-
STATE						
Haryana	4.09 (million)	19.3	-	-	-	-

Source: Census Data, 2001

2) Mahendergarh

As far distribution of caste is concerned schedule caste population in Mahendragarh district is 16.3% against state figure of 19.3%. In project affected region the percentage of the schedule caste population is 17.6%. Schedule tribe population is almost non-existing in Haryana.

Table 4-19 Comparison of the Social Profile of Mahendergarh District

Area	SC Population nos.	SC Population %	ST Population nos.	ST Population %	Below Poverty Line Population	Below-Poverty Line Pollution %
AFFECTED TEHSIL OF MAHENDRAGARH DISTRICT						
Mahendragarh	1,452	5.62	-	-	-	-
Narnaul	6,935	17.6	-	-	-	-
DISTRICT						
Mahendragarh	132,512	16.30	-	-	-	-
PROJECT AFFECTED REGION						
	235,569	17.6	-	-	-	-
STATE						
Haryana	4,091,110	19.3	-	-	-	-

Source: Census Data, 2001

4.10.4 Occupational Pattern

Occupational pattern of Rewari and Mahendragarh District and Haryana are recorded to assess skills of people and identify dominating economic activity in the area.

1) Rewari

The majority of people in rural sector are cultivators & agricultural labours which indicates dominant agricultural economy (Table 4-20). A small section of people are engaged as workers in household/industries. But in urban sector the existing scenario is completely reversed as most of the people are engaged in non-agricultural activity especially in industrial sector. Though the corridor is mostly passing through villages, major thrust should be on rural sector. In Rewari 57.7% of total workers are engaged in agriculture sector and 42.3% of total worker engaged in non- agriculture sector.

Table 4-20 Number of Marginal Worker by Category(Rewari)

Area	Cultivator	Agricultural Labour	Worker in household / industries	Others
Haryana	36.0	15.3	2.6	46.1
Rewari District	39.0	11.4	2.9	46.7

Note: All figures indicate % with reference to total workers
Source: Primary Census Abstract 2001

Per capita income: Per capita income reflects overall economic condition of the region/state of the state. The average per capita income in rural area of Rewari district is Rs.31,222 whereas the per capita income in urban area is Rs.50, 724, which is much higher. However the average per capita income in rural sectors of the project-affected region is Rs.30, 870. The average per capita income in rural sector is almost half of urban sector thus indicating that rural economy is poorer as compare to urban economy. There is hardly any considerable difference between figures of Rewari district and the project-affected region.

2) Mahendergarh

The majority of people in rural sector are cultivators & agricultural labours which indicates dominant agricultural economy (Table 4-21). A small section of people are engaged as workers in household industries. But in urban sector the existing scenario is completely reversed as most of the people are engaged in non-agricultural activity especially in industrial sector. Though the corridor is mostly passing through villages, major thrust should be on rural sector. In Mahendragarh 65.8% of total worker engaged in agriculture sector and 34.2% of total workers engaged in non- agriculture are sector.

Table 4-21 Number of Marginal Worker by Category(Mahendragarh)

Area		Cultivator	Agricultural Labour	Worker in household / industries	Others
Haryana	Rural	36.0	15.3	2.6	46.1
Mahendragarh District	Rural	54.7	11.1	2.2	32.0

Note: All figures indicate % with reference to total workers
Source: Primary Census Abstract 2001

Per capita income: Per capita income reflects overall economic condition of the region state. The average per capita income in rural area of Mahendragarh district is Rs. 25,880 whereas the per capita income in urban area is Rs.43,902, which is much higher. However the average per capita income in rural sectors of the project-affected region is Rs. 28,551. The average per capita income in rural sector is almost half of urban sector thus indicating that rural economy is still poorer than urban economy. There is hardly any considerable difference between Mahendragarh district figure and project affected region.

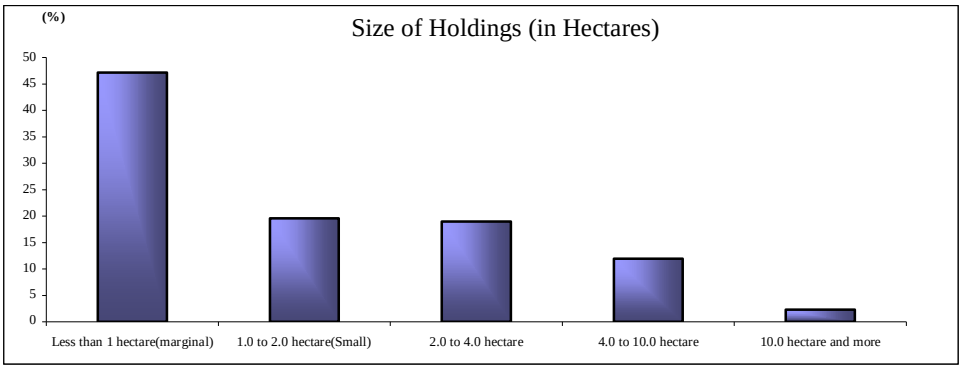
4.10.5 Land Holding

Land holding size indicates economic condition of a farmer and his contribution to the economy. If marginal or small farmers contribute the majority of land holding class then further reduction in land holding can affect the economic condition as well as quality of life.

1) Rewari and Mahendergarh

If marginal or small farmers contribute the majority of land holding class then further reduction in land holding can affect the economic condition as well as quality of life. The average size of holdings is continually declining in the State. As per latest available information, 47.14% holdings are of less than one ha and are marginal farmers. The average

size of 90% of small and marginal farmers is about 0.5 ha. 19.6% holdings are in between 1 and 2 ha and are small farmers. 19.0% farmers have land holding of 2 - 4 ha, 11.94% farmers with land holding of 4-10 ha and only 2.32% farmers have land holding of more than 10 ha. Graphical representation of land holding during 1995-96 of Haryana is shown in Figure4-10 below. Table4-22 shows comparative analysis of land holding size during 1985-86 and 1995-96. Size of holding is gradually decreasing which has direct bearing on land use, occupational pattern and economy.



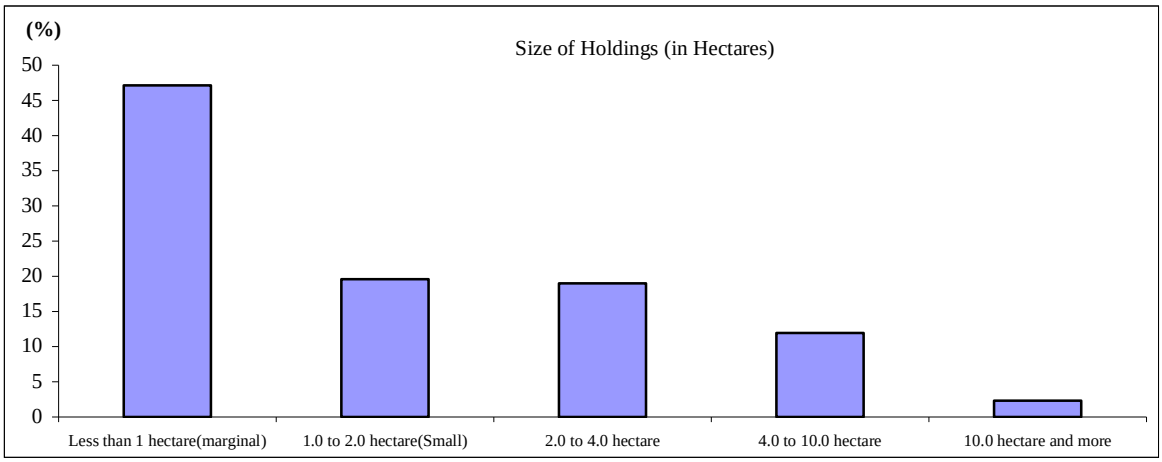
Source: Census Report 2001

Figure 4-10 Trend analysis of holding in Rewari, Haryana

Table 4-22 Trend Analysis of Land Holding in Rewari

S. No.	Size of Holdings (ha)	1985-86	1995-96
		(In %)	
1.	Less than 1 ha (marginal)	37.3	47.14
2.	1.0 to 2.0 ha (Small)	19.6	19.58
3.	2.0 to 4.0 ha	20.6	19.0
4.	4.0 to 10.0 ha	17.7	11.94
5.	10.0 ha and more	4.5	2.32

If marginal or small farmers contribute the majority of land holding class then further reduction in land holding can affect the economic condition as well as quality of life. The average size of holdings is continually declining in the State. As per latest available information, 47.14% holdings are of less than one ha and are marginal farmers. The average size of 90% of small and marginal farmers is about 0.52 ha. 19.58% holdings are in between 1 to 2 ha and are small farmers. 19.0% farmers are there having land holding of 2 to 4 ha, 11.94% farmers are there having land holding of 4 to 10 ha and only 2.32% farmers having land holding of more than 10 ha. Graphical representation of land holding during 1995-1996 in Haryana is shown in Figure 4-11. Table 4-23 shows comparative analysis of land holding during 1985-86 and 1995-96. Size of land holding is decreasing gradually which has direct bearing on land use, occupational pattern and economy.



Source: Census Report 2001

Figure 4-11 Trend Analysis Of Land Holding In Haryana

Table 4-23 Trend Analysis of Land Holding in Haryana

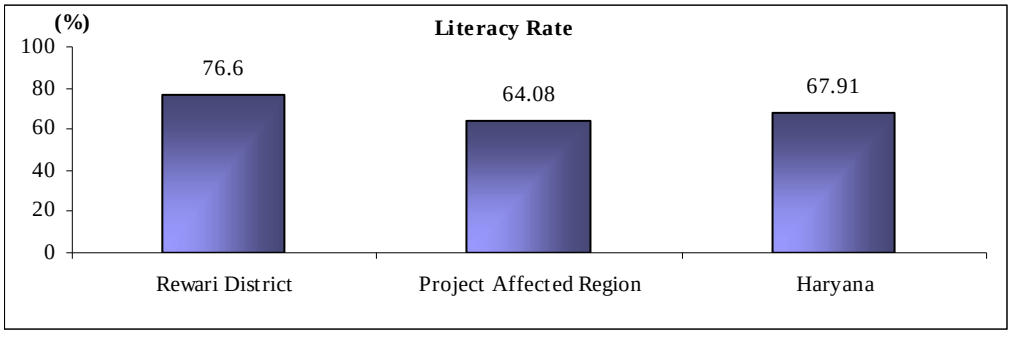
S.NO	Size of Holdings (ha)	1985-86 (%)	1995-96 (%)
1.	Less than 1 ha (marginal)	37.3	47.1
2.	1.0 to 2.0 ha (Small)	19.6	19.6
3.	2.0 to 4.0 ha	20.6	19.0
4.	4.0 to 10.0 ha	17.7	11.9
5.	10.0 ha and more	4.5	2.3

4.10.6 Other Key Socio-Economic Indicators

(1) Literacy Rate

1) Rewari District

Literacy level is quantifiable indicator to assess the development status of an area or region. It is 76.6% within Rewari District as against 67.9% in the state. In the Project affected region it is 64.1% only. Rewari district is better placed in literacy as compared to the state (Figure 4-12).

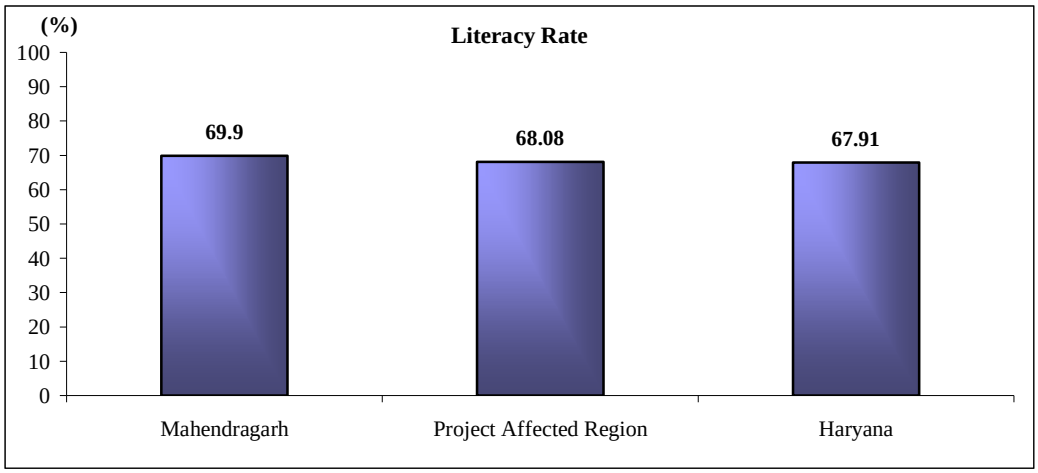


Source: Census Report 2001

Figure 4-12 Comparison between State, Region & District figures showing Literacy Rate

2) Mahendergarh

Literacy level is 69.9% in Mahendragarh District as against 67.9 in the state. In project-affected region it is 64.1% only. The literacy rate in the project-affected region is lower as compared to the district and the state.



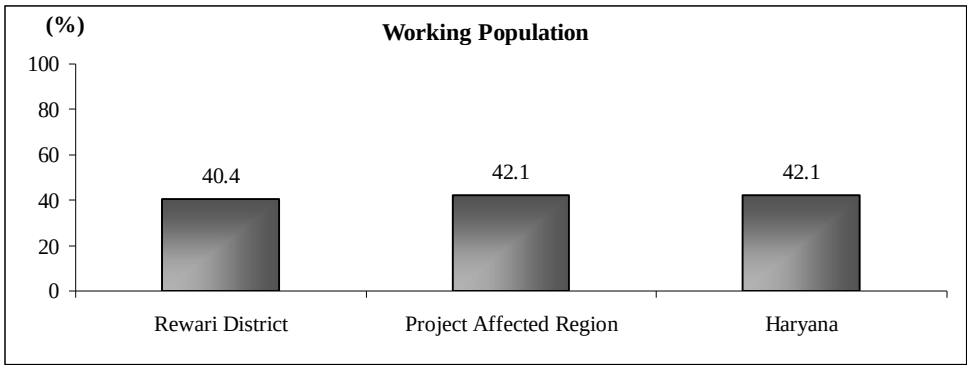
Source: Census Report 2001

Figure 4-13 Comparison Between State, Region & District Figures Showing Literacy Rate

(2) Economic Condition

1) Rewari

Percentage of working population is another important socio-economic indicator to assess overall economic condition of a region. Generally greater working population represents stronger economy. It is clear from Figure 4-14 that non-working people consist of the majority of the population at state, region and district level. State and regional figures reveal that 42.1% of the total population works in various sectors. Whereas, in Rewari District working population is 40.4%.

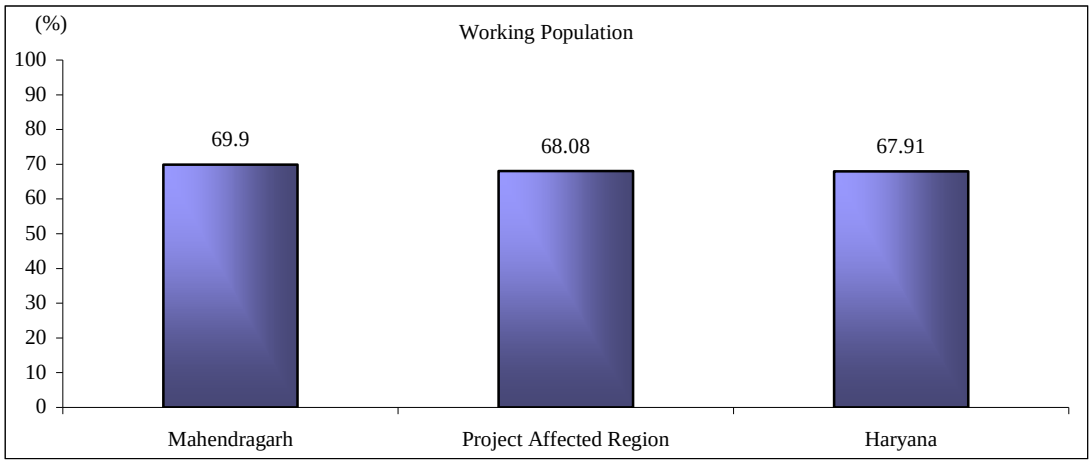


Source: Census Report 2001

Figure 4-14 Comparison between State, Region & District Figures Showing Working Populations

2) Mahendergarh District

It is clear from Figure 4-15 that non-working people consist of the majority of the population at state, region and district level. State (39.6%) and regional figures reveal that 42.1% of the total population work at various sector in the society whereas in Mahendragarh District working population (43.3%) is almost 1% bigger than state as well as regional figure.



Source: Census Report 2001

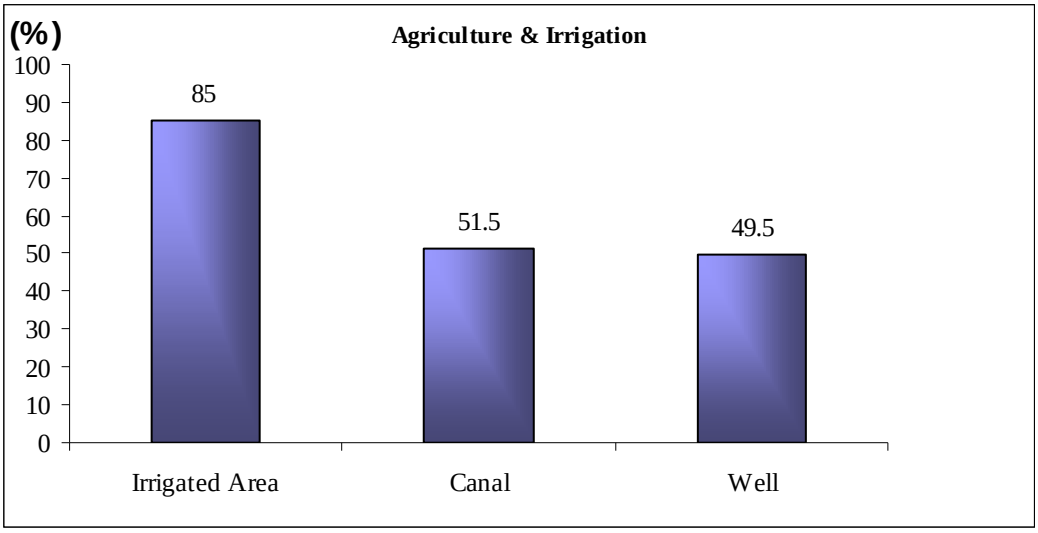
Figure 4-15 Comparison between State, Region & District Figures Showing Working Populations

(3) Agriculture & Irrigation

1) Rewari

Agriculture and irrigation also reflect on economic condition of a region. Rural economy is mainly based on agriculture. Agriculture with irrigation facilities results in higher production and leading to better economic condition. In Rewari District, more than 75% of the agricultural land is irrigated either by tube well or canals as against 85% in Haryana. Figure 4-16 shows present status of irrigation Status in Haryana.

51.5%of the agricultural land is irrigated by wells/tube wells and rest 49.5% by canals.



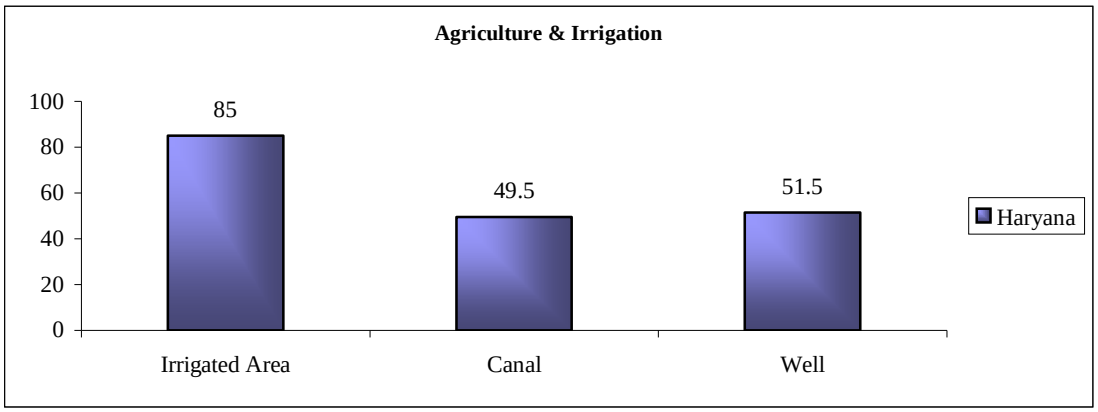
Source: Census Report 2001

Figure 4-16 Comparison between Haryana and Rewari District showing Agriculture & Irrigation

2) Mahendergarh

In Mahendragarh District more than 70% of the agricultural land is irrigated either by tube well / canal as against 85% in Haryana. Figure 4-17 shows present status of irrigation in

Haryana. 51.5% of the agricultural land is irrigated by wells / tube wells and the rest 49.5% by canals.



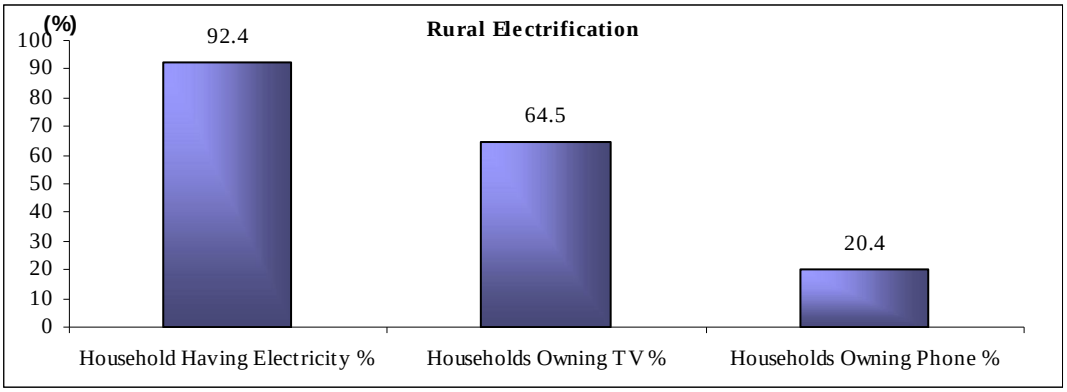
Source: Census Report 2001

Figure 4-17 Comparison between Haryana and Mahendragarh District Showing Agriculture & Irrigation

(4) Rural Electrification

1) Rewari

Electrification of rural sector is another major indicator of economic growth and quality of life. Electricity plays a vital role in complete development. In project-affected region, all households have electricity connection as against 92.40% household in the Rewari district region. Further development is this sector is required for better economic growth for quality of life. Figure 4-18 shows present status of number of electrified households in project-affected region and in Rewari district. The figure also reveals the percentage of households having electrical appliances like TV (64.50%) and important commodities like phone (20.40 %), etc.

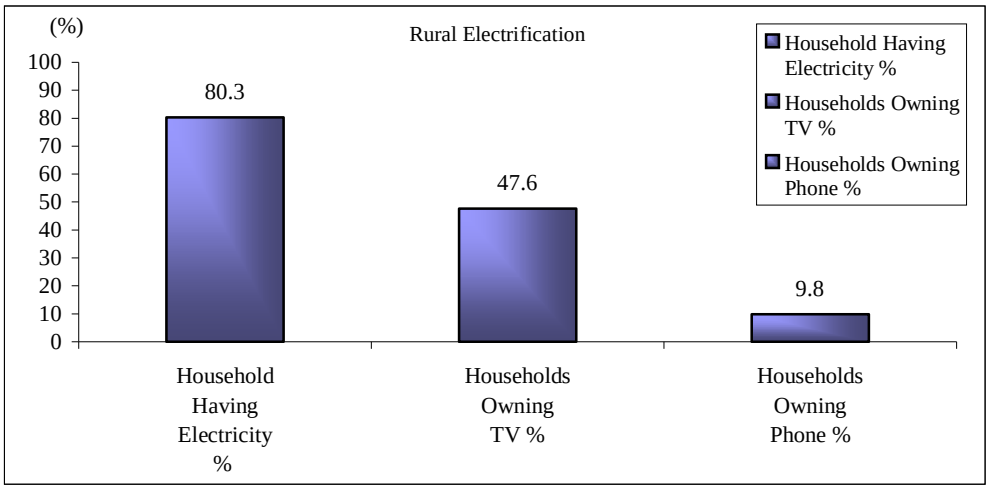


Source: Market Skyline

Figure 4-18 Penetration of Electricity, TV & Phone in households: 2006 (%)

2) Mahendergarh

In project-affected region all households have electricity connection and in Mahendragarh district 80.3% of the households having electricity connection. Further development is this sector is required for better economic growth and quality of life. Figure 4-19 shows present status of number of electrified households in project-affected region and in Mahendragarh district. The figure also reveals the percentage of households having electrical appliances like TV (47.6%) and important commodities like phone (9.8%), etc.



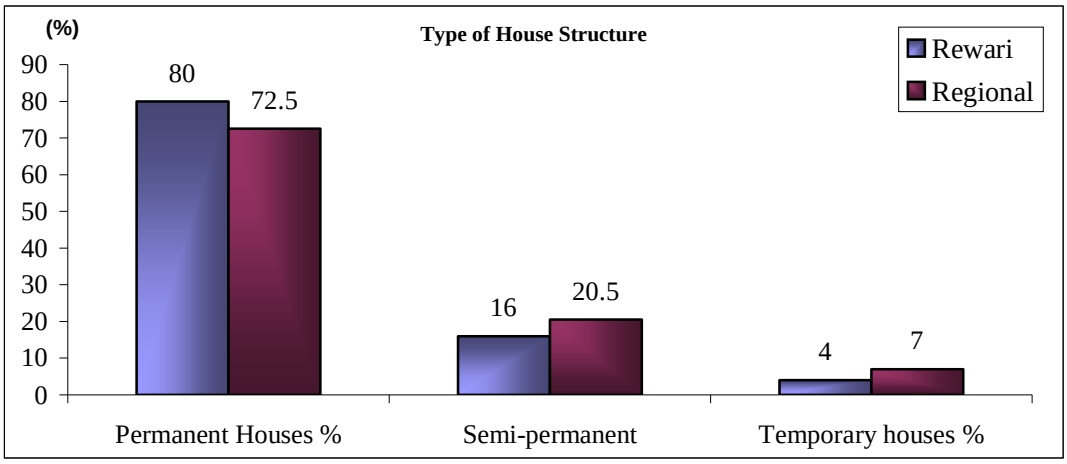
Source: Market Skyline, 2006

Figure 4-19 Penetration of Electricity, TV & Phone in households: 2006 (%)

(5) Type of House Structure

1) Rewari

Types of house structure also reflect on the economic condition of an area. Permanent house structures represent relatively better socio-economic condition than semi-permanent or temporary house structures. In Rewari district 80% of the house structures are permanent, 16% are semi-permanent and only 4% house structures are temporary, whereas in Project affected region 72.5% of the house structures are permanent, 20.5% are semi-permanent and only 7% (Figure 4-20)

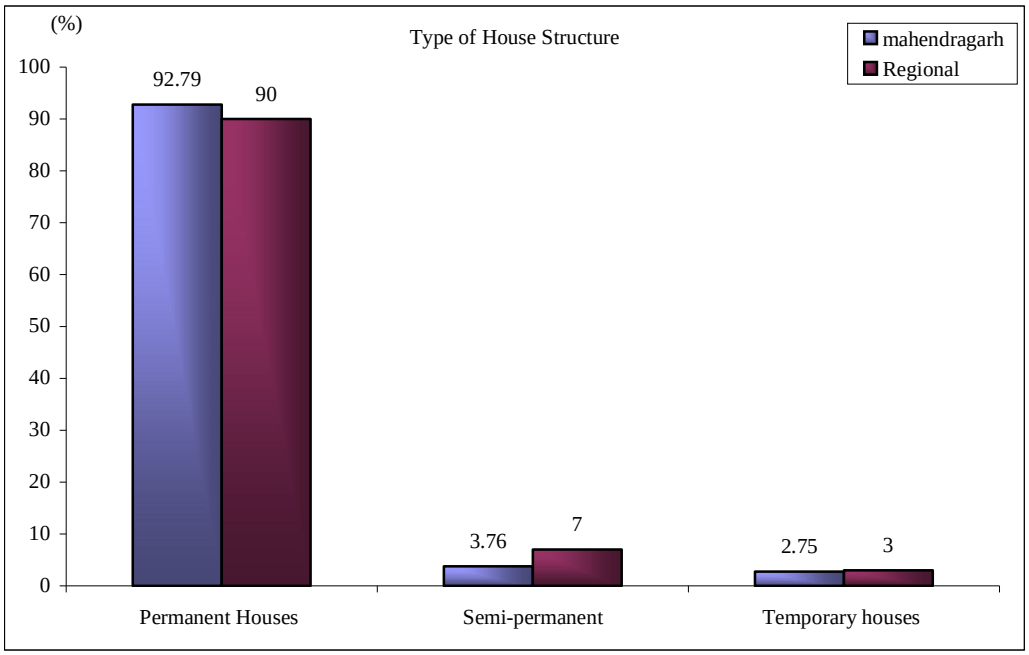


Source: Census Report 2001

Figure 4-20 Classification of Houses by Type of Construction (2001)

2) Mahendergarh

In Mahendragarh district 92.8% of the house structures are permanent, 3.8% are semi-permanent and only 2.6% house structures are temporary. Whereas in Project affected region 90% house structures are permanent, 7% are semi-permanent and 3% are temporary (Figure 4-21). Comparison between Mahendragarh District and regional features reveals that Mahendragarh District conditions same than regional status as far type of house structures is concerned.



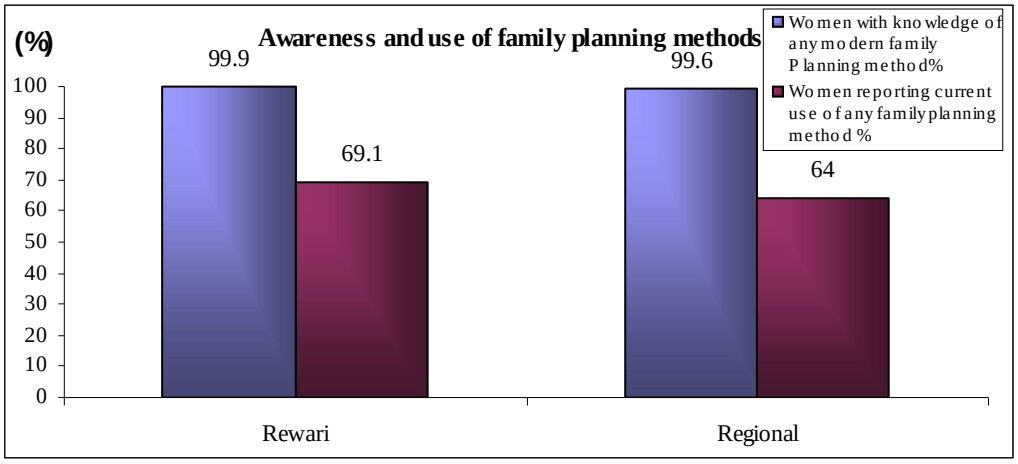
Source: Census Report 2001

Figure 4-21 Classification of Houses by Type of Construction (2001)

(6) Awareness and use of family planning methods

1) Rewari

The women are aware of family planning methods (Figure 4-22). 99.9% and 99.6% of women population are aware of family planning methods in Rewari and project affected region respectively. In Rewari 69.1% and in project-affected region 64% of women population have been reported to have current use of family planning methods. But as far family planning method in practice is concerned, Rewari district is better placed than the project-affected region.



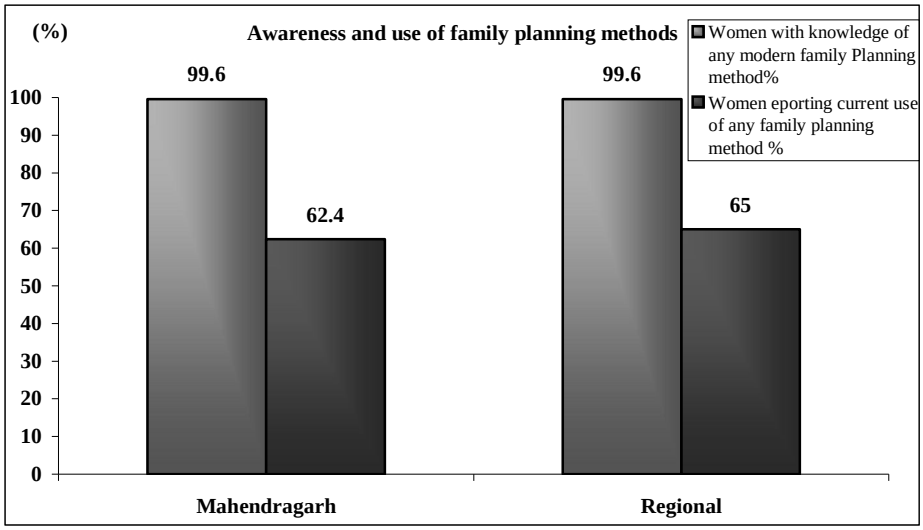
Source: Reproductive and Child Health Report

Figure 4-22 Awareness and Use of Family Planning Methods: 2003-04 (%)

2) Mahendergarh

The women are aware of family planning methods (Figure 4-23). 99.6% women in the project-affected region in Mahendragarh have knowledge about family planning methods. In

Mahendragarh 62.4% and in project-affected region 65% of women population have reported to us current family planning methods. But as far family planning method in practice is concerned Mahendragarh District is better than the project-affected region.



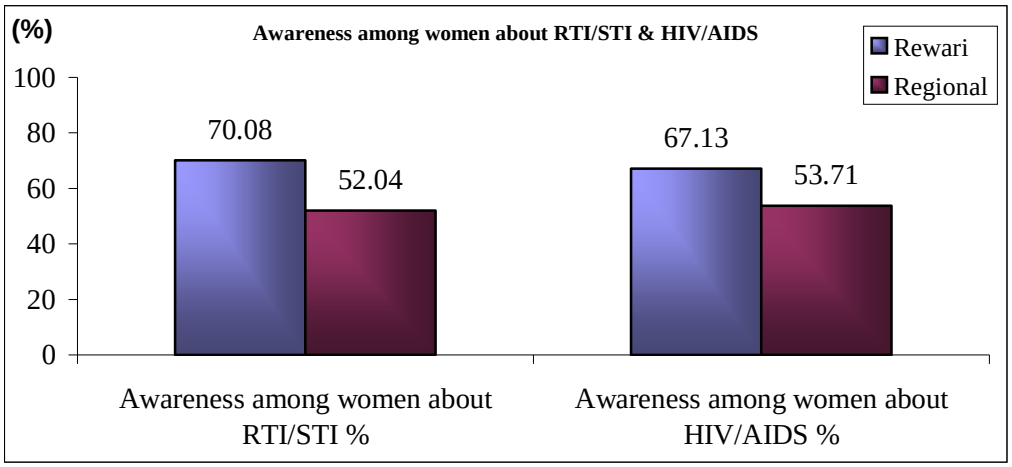
Source: Reproductive and Child Health, 2003-04

Figure 4-23 Awareness and Use of Family Planning Methods: 2003-04 (%)

(7) Awareness among women about RTI/STI & HIV/AIDS

1) Rewari

Awareness about respiratory/stomach infection or HIV/AIDS is necessary as there is potential risk of spreading of these during construction phase. As shown in Figure 4-24 it can be observed that in the district, women have higher awareness of RTI/STI & HIV/AIDS as compared to the project-affected region. 70.1% population is aware of RTI/STI in project-affected district and 52.0% population in the project affected region. On the other hand, approximately 67.1% of population is aware of HIV/AIDS in project-affected district and 53.7% population in project affected region.

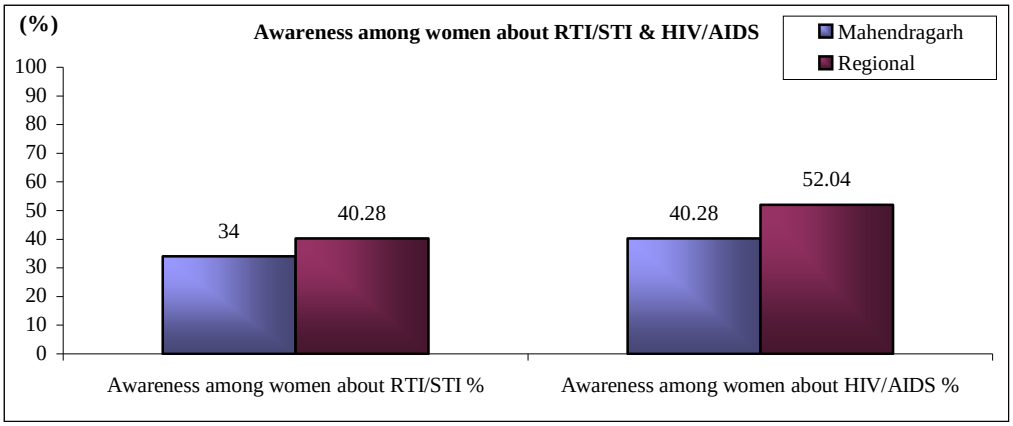


Source: Reproductive and Child Health Report

Figure 4-24 Awareness among Women about RTI/STI & HIV/AIDS: 2003-04 (%)

2) Mahendergarh

Awareness about respiratory/stomach infection or HIV/AIDS is necessary as there is potential risk of spreading of these during construction phase. In the district, women have higher awareness for RTI/STI & HIV/AIDS 34% population is aware of in Project affected district and 52.0% population is in project-affected region (Figure 4-25). On the other hand, approximately 40.3% of population is aware of HIV/AIDS in Project affected district and 53% of population about HIV/AIDS in Project affected region.



Source: Reproductive and Child Health, 2003-04

Figure 4-25 Awareness Among Women About RTI/STI & HIV/AIDS: 2003-04 (%)

4.10.7 Socio-Economic Features on Primary Data

Baseline socio-economic features of the DFC project demonstrate socio-economic characteristics of the Project Affected Persons (PAPs) and provide an insight on developing indicators for monitoring and evaluation of R&R measures and actions to be taken up.

Demographic and social characteristics of the project affected persons along DFC Corridor in Haryana and Rewari, Mahendragarh District present demographic (age and gender composition, average family size, literacy level, marital status, religion, caste, etc.), economic, land holding size, household asset, type of structures, etc. Baseline socio-economic indicators of Rewari and Mahendragarh District and project-affected region are provided in Table 4-24.

Table 4-24 Baseline Socio-economic Indicators

S. No	Indicator	Unit	District (Rewari)	District (Mahendergarh)	Project affected region
1	Demographic Characteristics				
	Average Family	Average	6	6	6
	Literacy	%	76.60	69.9	73.20
	Sex Ratio		893	916	899
	Social Stratification (no.& % of PAFs)				
	SC	%	18	14.80	16.40
	ST	%	0	0	0
	Others	%	82	85.2	83.6
2	Economic				
	Annual Income (in Rs.)	Average	40,923	34,891	37,904
	Family under debt	%	-	-	
	Family under debt (in Rs.)	Average	-	-	
3	Ownership		-	-	
	Own with title	No.	-		
	Total land holding	Average	-		
	3 Major production				
	Wheat	Average	4129 kg\ hec	3963 kg\hec	4046kg\hec
	Rice	Average	2652kg\ hec	2749kg\hec	2701kg\hec
	Maize	Average	-	-	-
	Own without title	No.	-		
4	Assets		-		
	Livestock (Draught animal, milk animal, young stocks, sheep, goats, etc.) per family	Average	2.5	1	1.6
	Agricultural Implements (Tractor, Power Triller, Thresher, Harvester, Genset Sprayer, pump sets, electric pump etc.) per family	Average	0.75	0.29	0.43
	Household Items(T.V., Fridge, Mixer, Electric Cooker, Geyser, Electric fan, OTG, Toaster, Microwave, Radio, etc.) per family	Average)	3.44	2.91	2.62
	Other Assets (Scooter/Motorcycle, Jeep/Car, Truck, Bus, Bullock /Camel Cart etc.)		0.64	0.34	0.48
5	Occupation		-		
	Govt. Service	%	3.07	14.28	8.05
	Private service	%	7.07	7.14	5.03
	Business	%	4.61	18.57	12
	Wage employee	%	-		
	Agriculture	%	60	21.42	41
	Daily wage labour	%	27.05	27.14	14
	Unemployed	%	-		
	Others	%	16	11.4	13.70
6	House Type		-		
	Single detached one storey(1)	%	57.14	57.14	28.74
	Single detached two storey(2)	%	14.28	14.28	7.04
	Single detached three storey or more(3)	%	4.29	4.29	2.14
	Apartment/Row house duplex(4)	%	0	0	0
	Shanties connected to each other	%	0	0	0
	Tents or tentative simple hut	Average	-		

Source: Primary Survey Data

CHAPTER 5 POTENTIAL ENVIRONMENTAL IMPACT EVALUATION AND MITIGATION MEASURES

5.1 INTRODUCTION

Potential environmental impact evaluation involves prediction of potential impacts by the development of the project on the surrounding area. Based on baseline environmental status described in part II and proposed project activities, potential impacts have been assessed, predicted and appropriate mitigation measures are suggested to avoid/reduce/compensate the potential adverse impacts and enhance the positive impacts. The impacts due to development of the proposed Dedicated Freight Corridor are assessed for planning, construction and implementation phases.

The following activities are likely to cause impact:

- Construction of Embankment
- Vegetation removal
- Settlements removal
- Utilities shifting
- Transportation of construction material
- Establishment of construction/ labour camp
- Borrow areas

5.2 IMPACT EVALUATION METHODOLOGY

The project is likely to have some potential impacts during planning, construction and operation phases. Appropriate mitigation measures are proposed to mitigate/reduce/eliminate the adverse impacts. Impact matrix is prepared depicting nature of impact by various activities on the environmental parameters.

Within the framework of DFC Project study, a simple method determining potential existence of impact has been employed. The magnitude and importance of the impacts caused by the project is presented. Matrix system is considered as a tool for organizing and presenting information on the environmental impacts caused to the natural and social environment by the DFC Project. Thus, the following parameter and scales are used for producing matrix impacts (Table 5-1).

Table 5-1 Parameter and Scale of Impact Matrix

Parameter	Scale		Remarks
Significance	No impact	E	Positive : + Negative : -
	Negligible impact	D	Positive : + Negative : -
	Insignificant impact	C	Positive : + Negative : -
	Relatively significant impact	B	Positive : + Negative : -
	Significant impact	A	Positive : + Negative : -

5.3 EXPECTED IMPACTS AND MITIGATION MEASURES

Impacts on natural resources are provided with appropriate mitigation measures are described below:

5.3.1 Topography and Geology

(1) Planning Phase

During planning phase, no impact is envisaged on the topography and geology of the project area.

(2) Construction Phase

- During construction phase change in topography is envisaged due to clearing of land, felling trees, cutting and filling of land and construction of structures.
- Construction of railway embankment is also likely to change the view of the landscape.
- Filling and cutting of land will be required in detour stretch where it traverses through undulating topography.
- However, changes will be limited within ROW of the track hence overall impact will be insignificant.
- No impact is envisaged on geology due to the project.

Mitigation measures

- Plantation program may be carried out to improve the aesthetic look of the construction area.

(3) Post- Construction Phase.

- No impact is envisaged on topography and geology in post-construction phase.

5.3.2 Soil

(1) Planning Phase

- No impact is envisaged on soil erosion during planning phase. Hence no mitigation measures are required.

(2) Construction Phase

- Clearing of land, cutting of trees, excavation of borrow areas are likely to trigger soil erosion. Movement of vehicle/machinery/equipments and working force is also likely to cause soil erosion
- The detour section is likely to traverse through agricultural and forest land which will require clearing of the land.
- Soil of the agricultural area is fertile and consists of alluvial deposits; loss of fertile soil is likely to occur.
- Borrow areas will be required for the project. Most portion of the DFC is embankment and cutting. The volume of earthwork estimated for the DFC corridor for embankment is 26,363,000 m^3, for blanket material 8,208,000 m^3, for embankment & blanket 34,571,000 m^3 and for cutting 773,000 m^3. The borrow areas are likely to cause soil erosion and affect agricultural areas.
- Pits may be formed due borrowing which may cause harm to local residents in the vicinity.

Mitigation Measures

- Suitable protection measures consisting of bio-engineering techniques such as plantation of grasses and shrubs and check dams, may be provided to control erosion.
- Borrow areas may be finalized in concern with ecological sensitivity of the area. Agriculture land may not be used as borrow areas. Priority may be given to degraded area for excavation

of borrows material. Rehabilitation of borrow area may be taken under the project.

- Construction work may be avoided during rainy season to evade erosion and spreading of loose material.
- Top soil removed from agricultural land may be stored separately in bundled areas and utilized during plantation or refilling of excavated area.
- Selection of borrow areas may be done considering the waste land available in the district. Agricultural areas may be not used as borrow areas.
- A separate borrow area management plan may be made providing location, ownership details, timing of borrowing and rehabilitation measures.

(3) Post- Construction Phase

- No impact is envisaged on soil during post implementation phase.

5.3.3 Ground Water

(1) Planning Phase

- No impact is envisaged on ground water in planning phase.

(2) Construction Phase

- During construction phase pollution of groundwater is likely to occur due to seepage and runoff from construction site. However the impact will be negligible.
- Borrow areas may act as recharge ponds enhancing the ground water level

Mitigation Measures

- Formation of stagnant pools may not be allowed near construction sites especially near workshop from where oil and other pollutants may seep into water.

(3) Post- Construction Phase

- No impact is envisaged on soil during post implementation phase.

5.3.4 Hydrology (Rivers and Lakes)

(1) Planning Phase

- No impact is envisaged on hydrological cycle during planning phase

(2) Construction Phase

- As per the baseline status and project site condition as described in earlier section, project site and its vicinity is highly vulnerable to drainage and flood. The impact due to drainage and flood is critical both during construction and operation. The construction of DFC will have long term and regional impact on drainage and flood.
- Drainage and flood problems during construction due to stockpiling of materials, debris and construction of temporary approach road and yards would have impact of temporary nature
- Local drainage may be affected during construction phase due to formation of embankments. The slope of Mahendragarh and Rewari is towards east and south –eastern side. During the construction stage, the embankment should be designed in such a way that natural drainage pattern is not disturbed to avoid water logging in the low-lying area.
- Drainage pattern of the area may be studied in detail and suitable management plan may be prepared in the Detailed Design stage.

Mitigation Measures

- Provision of temporary drainage arrangement due to construction activities must be made by the contractor and suitable and strict clause incorporated in general conditions of the contract document for its effective implementation.
- Silt fencing may be provided near water bodies
- Proper drainage may be planned in the area to avoid water logging.

(3) Implementation Phase

- Local drainage is likely to be affected due to formation of Railway Embankment.

Mitigation Measures

- Cross drainage structures may be provided.

5.3.5 Flora

(1) Planning Phase

- No major impact is envisaged on flora in planning phase. Only trees along the railway corridor and trees in private land need to be felled for laying down the Dedicated Freight Corridor.
- The private land owners may be compensated for the loss of trees. Rates of trees as provided by the Forest Department are given in Table 5-2.

Table 5-2 Market Rate of Trees

Species Name	Values		
	Market Price (Rs per Ft^3)		
	3 Ft^3	4Ft^3	5Ft^3 and above
Sagun *(T.grandis)*	1,200	1,350	1,500
Neem *(A.indica*)	300	315	350
Desi Babool (*Acacia* Spp.)	300	305	350
Seesam (*D.sisoo*)	300	345	650
Khajri (*P.cerrnis*)	290	300	450

Market Rate of Bamboo

Bass(*D.strictus*)\Per Length	24 ft	22 ft	18 ft	15 ft	10 ft	10 ft (Green)	10 ft (Dry)	Strip
Rs.	50-52	40-45	35-40	15-20	13	10.50	12.50	10.75

Source: Forest Corporation, Haryana

- The land along the railway line comes under the jurisdiction of Railway Ministry. As per the Indian Forest Act the forest land along the railway line falls under protected forest. The land along railway line is not transferred to Forest Department but Forest Clearance for cutting trees along railway line in both Mahendragarh and Rewari districts is required, with prior permission of the Railway Department.
- Approximate 48 km patch of DFC line is passing through Mahendragarh District and along the railway track *Acacia* species, *A.indica*, *Eucalyptus* and *Prosopis species* are found. There is no forest area would be affected by the project and approximate 1,462 trees will be affected trough this project.
- Approximate 28 km patch of DFC line passes through Rewari District and along the track *Acacia* species, *A.indica, Eucalyptus* and *Prosopis* species are found. An open forest area between Kori and meli railway station would be affected by the project. The length of affected area is approximate 750 m. Approximate 1,210 trees and 1.8 ha area of forest would be affected by this project.

(2) Construction Phase

- The construction activity involving clearing of site, felling of trees, settlement of construction camps and office is likely to affect the flora and fauna of the area.
- The tree species likely to be affected are Sheesham (Dalbergia sisoo),Vilayti Baool (Prosopis Spp.), Neem (Azadirachta indica), Desi Babool (Acacia Spp.), Ber (Zizyphus mauritiana), and Eucalyptus (Eucalyptus hybrid) planted outside forest area.
- Acquisition of the forest land and construction activity is likely to disturb the habitat of wildlife.
- Tree cutting along the alignment is likely to affect the fauna, particularly the birds.
- Disturbance will be caused to animals in their movement, feeding, breeding and resting.
- The animal species likely to be affected do not fall in rare, threatened and endangered category and are common in distribution.

Mitigation Measures

- Felling of trees must be undertaken only after obtaining clearance from the Forest Dept.
- Trees outside the ROW should not be felled.
- Compensation must be provided before initiating construction activity.
- The loss of fruit bearing trees may be compensated including 5 years fruit yield.
- Labour camps and office site may be located outside and away from the forest area.

(3) Post-Construction Phase

- No impact is envisaged on flora during post construction phase, however, development of green belt is suggested near stations and maintenance of plantation may be undertaken by Railway Dept. The plantation carried along alignment as compensatory afforestation is likely to enhance the ecological condition of the area.

5.3.6 Fauna

(1) Planning Phase

- No impact is envisaged on fauna in planning phase

(2) Construction Phase

- The habitat of wildlife is likely to be disturbed during construction phase.
- Nilgai- Boselaphus tragocamelus is the most common wildlife found in the area. The construction activity is likely to affect the movement of the animal
- Most of the fauna such as Vulpus bengalensis (Fox), Canis aureus (Jackal), etc. are restricted towards the ravenous land. However, the construction activity is likely to affect the resting, breeding and feeding activities of the animals.
- Felling of trees is likely to affect the avifauna.
- During construction near water bodies, the aquatic life is likely to be affected.
- The impact on the habitat is likely to be permanent, as the DFC will fragment the area, restricting the movement of animals on either side.

Mitigation Measures

- Crossing passages must be made for wildlife by provision of under pass followed with some

plantation so that it resembles with the habitat of wildlife and facilitates crossing of wildlife.

- Water bodies may be developed inside forest areas for the birds.
- Borrow areas can also be developed as ponds with grasses and shrubs planted around it.
- Silt fencing may be used near water bodies to avoid runoff into the water bodies
- Construction activity may be avoided during night hours in forest area.
- Poaching must be strictly banned in the forest area. It may be ensured by the contractor that no hunting or fishing is practiced at the site by the workers and site personnel are aware of the location, value and sensitivity of the wildlife resources
- Awareness program on environment and wildlife conservation may be provided to the work force. Forest Act and Wildlife Act may be strictly adhered to.

(3) Post-Construction Phase

- The movement of Freight Train is likely to restrict the movement of wildlife on either side of the track
- Possibilities of collision of wildlife with Freight train.
- Disturbance to wildlife due to the noise produced during the passage of train.

Mitigation Measures

- Animal underpasses made for wildlife near forest areas must be camouflaged to match the surrounding environment with plantation of shrubs and trees.
- Fencing if feasible, may be provided along DFC in wildlife habitation concentration areas to avoid collision.

5.3.7 Biodiversity

(1) Planning Phase

- No impact is anticipated on biodiversity during planning phase.

(2) Construction Phase

- The DFC is not likely to affect the biodiversity, as there are no endangered and threatened species of flora and fauna.
- The disturbance to flora (feeling trees and acquiring agricultural land) and fauna is not likely to change the biodiversity of the area. The alignment is not traversing through National Park, Biosphere or Sanctuary.

Mitigation Measures

- Plantation of forest and fruit trees species may be undertaken to maintain the diversity. Forest, Horticulture and Agricultural Dept may be consulted.
- The project must support habitat development program as a part of conservation of biodiversity.

(3) Post-Construction Phase

- No impact is envisaged on biodiversity during post- construction phase.

5.3.8 Protected Areas/Sanctuaries

The DFC alignment is not traversing through any National Park and Sanctuary in Mahendragarh or Rewari districts. The nearest sanctuary (Nahar Wildlife Sanctuary) is located 22 km away from the project corridor. The DFC is likely to have no impact on the Nahar Wildlife Sanctuary.

5.3.9 Landscape

(1) Planning Phase

- No impact on landscape during planning phase

(2) Construction Phase

- During construction phase, the landscape within the ROW of DFC is likely to alter due to improper excavation of borrow pits, construction of temporary approach roads and construction and labor camps are the usual practices degrading the existing topography and landscape.

Mitigation Measures

- Landscaping Plan involving the following may be formulated for restoration, levelling and landscaping of the area after completion of construction activities.
- The stockpiles may be designed such that the slope does not exceed 1:2 (vertical to horizontal) and the height of the pile is restricted to 2 m.
- Stockpiled topsoil may be used to cover the disturbed areas and cut slopes. The top soil shall be utilized for redevelopment of borrows areas, landscaping along slopes, incidental spaces, etc.
- Incorporation of suitable and effective contractual clauses for rehabilitation and restoration of borrow areas and other temporary works and landscaping it with surrounding area immediately after its use
- Landscaping of surrounding area with plantation, Ornamentals plants may be planted near Stations.

(3) Post-Construction Phase

- No impact is envisaged on landscape in operation phase, however the green belt development

5.3.10 Environmental Impact MATRIX

Based of the potential impacts on natural resources in planning construction and operation phase an impact matrix has been framed. The scale used is provided in Table 5-3. Environmental Impact Matrix for Rewari and Mahendragarh is given in Tables 5-4 and 5-5.

Most the impacts are insignificant and temporary in nature with localized impact.

Table 5-3 Environmental Impact Matrix - Rewari District

S. No	ProjeC-t AC-tivities / Items of the Environment	Overall Evaluation of the Project	Pre-Construction			Construction Stage											
			Survey of Planning areas and Sites	Selection of the Project location & Sites	Land Acquisition & Resettlement	Extraction of Building Materials at Quarries and Borrow areas	Earth Moving Cutting and Filling of the Construction Works	Preparation of the Construction Plants & Warehouses, Work	Operation of plants	Construction Works for Railway line & Related Structures						Localized Employment Opportunities of the Const. Works	Localized Business Opportunities related to the Const. Works
										(A) Const. works for Railway Lines & Installation of	(B) Construction Works for ICDS and Freight	(C) Const .Works for Stations (Terminal,	(D) Const. work for POBs &	(E) Const. Works for Bridges	(F) Const. Works for Tunnels		
A	Natural Environment																
1	Topography & Geology	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	C-
2	Soil	C-	D-	D-	E	C-	D-	C-	C-	C-	C-	C-	D-	C-	E	E	E
3	Ground water	C-	D-	D-	C-	D-	D-	D-	D-	D-	D-	D-	D-	D-	E	D-	E
4	Hydrological Condition	C-	C-	C-	C-	D-	C-	D-	D-	C-	D-	C-	D-	C-	E	C-	C-
5	Coastal and Marine Environment	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
6	Fauna, Flora & Biodiversity	C-	C-	C-	C-	C-	C-	D-	C-	C-	D-	C-	D-	D-	E	D-	D-
7	Protected Areas /Sanctuaries	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	E	D-	D-
8	Landscape	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-
9	Local Meteorological ConditioN	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-		D-	D-
10	Global Warming	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-

Note: A: Significant impact, B: Relatively Significant impact, C: Insignificant impact, D: Neglectable impact, E: No impact, + Positive, - Negative.

Table 5-4 Environmental Impact Matrix (Post Construction Phase) – Rewari District

S. No.	Project Activities / Items of the Environment	Post Construction Phase								
		Traffic Conditions of Freight Trains	Logistic Condition of Goods, Raw Materials, Agricultural and Industrial Products	Traffic Condition of Roads	Operation and Maintenance of Railway lines and Related Structures	Employment Opportunities (whole country/local level)	Freight-oriented Business Opportunities	Passenger Oriented Business Opportunities	Promoting Development of Surrounding Area	Increase in Settlers and Visitors to the Project Area
A	Natural Environment									
1	Topography and Geology	C-	D-	C-	C-	D-	D-	D-	C-	D-
2	Soil Erosion	E	C-	D-	C-	E	D-	E	D-	E
3	Groundwater	E	E	E	E	E	E	E	E	E
4	Hydrological Conditions (Rivers, Lakes, etc.)	C-	D-	D-	C-	D-	D-	E	C-	E
5	Coastal and Marine Environment	E	E	E	E	E	E	E	E	E
6	Fauna, Flora and Biodiversity	C-	D-	D-	D-	D-	D-	D-	C-	E
7	Protected Areas, Natural/ecological Reserves and Sanctuaries	D-	D-	D-	D-	D-	D-	D-	D-	D-
8	Landscape	D-	D-	D-	D-	D-	D-	D-	D-	D-
9	Local Meteorological Conditions	D-	D-	D-	D-	D-	D-	D-	D-	D-
10	Global Warming	D-	D-	D-	D-	D-	D-	D-	D-	D-

Note: A: Significant impact, B: Relatively Significant impact, C: Insignificant impact, D: Neglectable impact, E: No impact, + Positive, - Negative.

Table 5-5 Scaling of Impacts on Natural Environment due to DFC Project

S.No	Natural Environment Contents	Scaling	Reasons (during Pre construction phase)	Reasons (during construction phase)	Reasons (after-construction phase)
1	Topography and Geology	C/ D	D-No significant impact is likely to take place.	C-During construction, marginal changes in geology are likely to take place because of excavation, construction of bridges etc. 2) No significant change in Topography is expected.	D-: No significant change is expected.
2	Soil Erosion	C/D	D-No significant impact is likely to take place.	C-During construction, marginal effect on soil because of erosion is likely to take place because the loss of upper crust of soil in the local area. The impact will be marginal only since the project is linear in nature.	D-: No significant change is expected. .
3	Ground water	D	D-No significant impact is likely to take place.	D- No significant impact is likely to occur	D- Only marginal impact is supposed to be felt.
4	Hydrological Condition	D	D-No significant impact is likely to take place.	D- It will have only marginal impact as no river or big water body is affected.	D-It is likely to have no significant impact.
5	Coastal and Marine Environment	E	E-Non existent	D-No significant impact is likely to occur	D-No significant impact is likely to occur
6	Fauna, Flora and biodiversity	B/C	D-No significant impact is likely to take place.	1) B-: Directly affected forest area in Rewari district is of approximately 1.8 ha (in Meli). 2) Loss of marginal herbal cover is imminent so it will have impact	D- Only marginal impact is supposed to be felt.
7	Protected areas, Natural/ecological reserves and sanctuaries	D-	D- No significant impact is likely to take place.	(1) D-: No Impact is likely to be felt as no such area is getting directly affected.	(1) D-: No Impact is likely to be felt.
8	Landscape	D-	D-No significant impact is likely to take place.	(1) D-: No Impact is likely to be felt.	(1) D-: No Impact is likely to be felt.
9	Local meteorological condition	D-	D-No significant impact is likely to take place.	D- No significant impact is likely to occur	D- No significant impact is likely to occur
10	Global Warming	D-	D-No significant impact is likely to take place.	D-No significant impact is likely to occur	D-No significant impact is likely to occur

5.4 SOCIAL IMPACT ASSESSMENT

Social impact assessment includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Within the framework of DFC Project study, social environment impact evaluation includes the following social consideration:

- Mitigation of problems including involuntary resettlement
- Local economy such as employment and livelihood
- Land use and utilization of local resources
- Social institutions such as social infrastructures and local decision institutions
- Existing social infrastructure and services
- Vulnerable social groups such as poor and indigenous peoples

Distribution of benefits and losses and equality in the developmental process social Impact Evaluation is an important component of the project preparation and is carried out to avoid, mitigate or reduce potential negative social impacts and to make the project socially viable and people friendly. The objective of social impact evaluation is to present the social impacts of the project, so that social concerns are incorporated into the project design and to avoid or minimize the adverse social impacts with the best possible engineering solutions at the most optimal cost with complete co-ordination among the engineering, environmental and social teams during the entire design process.

5.4.1 Approach and Methodology

Within the framework of DFC project study, socio-economic survey was conducted in Rewari and Mahendergarh District of Haryana State. Following methodology has been adopted to conduct social environment impact evaluation study.

1) Identified affected districts, sub-districts and villages where existing railway is passes through in parallel and detour sections. The villages were identified by using the GPS register as a positioning reference of the relevant points detour alignment, verified with the geographical data available on Goggle Earth™ and the correspondent 1:50,000 scale topographic charts.

2) Understanding perspective of the problems of PAFs and objective of the study

3) Finalization of schedule/questionnaire

4) Identification of Affected Structures

   a) All affected structures were listed/counted at a distance of 25 m from the center of the existing track nearest to DFC Project in the parallel section except selected crossing stations & junction stations.
   b) All affected structures were listed/counted at a distance of 43.5 m from the center of the existing track nearest to DFC Project in the detour sections.
   c) All the affected structures were listed/counted at a distance of 60 m and 2 km in length from the center of the existing track in parallel section for selected crossing stations & junction stations.
   d) All the affected structures were captured through drawing on the register represent complete social mapping of the affected village.

5) Socio-economic survey was conducted of 10% of the total affected structures at each locality of the detour routes, junction stations and crossing stations as well as road over bridges or road under bridges. A detailed questionnaire was used to collect information on:

   - Demographic details of affected family
   - Ownership of land and structure affected
   - Occupation patterns
   - Household assets
   - Income and expenditure
   - Land holding size
   - Ownership of other assets, etc.

   a) In parallel sections, the socio-economic survey was conducted at a distance of 25 meters from the centre of the existing track nearest to DFC Project.

   b) In detour sections, the socio-economic survey was conducted in 43.5 m wide area.

   c) In selected junction stations and crossing stations, the socio-economic survey was conducted at a distance of 60 meters and 2 km in length from the center of the existing track nearest to DFC Project

6) Compilation, computerization and analyses of the collected primary and secondary information

7) Parameter and scale of impact matrix and its description

8) Preparation of Resettlement and Rehabilitation Framework

5.4.2 Land Acquisition and Resettlement

The project length of the Western Corridor in Rewari District is 28 km. A total number of 24 revenue villages are likely to be affected due to the land acquisition activities for DFC project.

The project length of the Western Corridor in Mahendragarh District is 48.0 km. A total number of 24 revenue villages are likely to be affected due to the land acquisition activities for DFC Project.

These villages are regular villages of Mahendragarh Sub-district (Tehsil) are situated in the parallel section of the existing railway corridor in eastern side, Haryana, Package 2 as shown in Table 5-6.

(1) Pre- Construction Phase and Construction Phase

Efforts were made to minimize the adverse impact of the project during the pre-construction and construction phase. Measures adopted for minimizing the adverse impacts are:

- Site selection for constructing infrastructure and other facilities are done in such a manner, that it involves minimal involuntary resettlement, e.g. 88.4 ha land in Rewari and 112.4 ha in Mahendergarh to be acquired in rural and urban areas where settlement is noticed.
- During design stage, extra care was taken to avoid affecting religious structures/public property.

(2) Post Construction Phase

- Loss of agricultural land and other types of land
- Loss of residential/commercial structures

(3) Mitigation Measures

- Ensure timely payment of compensation for loss of land, structure and assets prior to taking over the possession;
- Provide assistance and support during the transition period for which they are entitled
- Reconstruction of affected structures and relocation to new sites
- Replacement of agriculture land or the value to PAFs

Positive impacts

DFC Project will result in substantial financial and social benefits. Several other macroscopic and indirect benefits are as follows

- The project will also lead to reduction in road congestion, reduction of air and noise pollution.
- The project will contribute towards increased speed and safety levels, which will help in faster distribution of goods and services.
- Maintaining and boosting the present trends of growth of economy of the country.
- The project will facilitate higher accessibility to existing and new areas and relieve several bottlenecks to development.
- Utilization of DFC Corridor for passenger trains connecting new areas along detour cannot be denied at this stage for more efficient utilization of the system.
- Industrial sector in the state is expected to receive a tremendous boost. As a result, new areas along detour sections will be opened up for urban-industrial settlement.

Table 5-6 Affected Villages in Rewari , Mahendergarh District

Chainage	Section	Sub -district	No of villages/town
1,310 to 1,291	Parallel & Detour Section	Rewari	24
48	Parallel Section	Mahendragarh	24

Source: Field Survey

5.4.3 Impact on Private Structures

(1) Rewari

A total number of 6 Project Affected Families (PAFs) and approx. 37 PAPs from one private structure is the target of involuntary resettlement in the built up area. It is also observed that 9 brick line factories are also affected. The impact found in this district is in significant. Table 5-7 provides details of impact on private structures in Rewari District.

1) Pre-construction and Construction Phase

- A total number of 1 structures include houses, residential cum commercial structures and shops in houses are the targets of involuntary resettlement thus making it an insignificant impact.

2) Mitigation Measures

- Reconstruction of structures and relocation to new sites or cash compensation to be given to affected families before the start of the project
- Refund of registration cost, stamp etc. incurred for replacement land to be paid by the project

Positive Impacts

- Increase business opportunities for the local people in terms of transporting their products in the future.

Table 5-7 Impacts on Private Structures in Rewari

Type of Structure	Number of structures	Number of PAFs	Number of PAPs
Houses	0	0	0
Residential cum comm.	1	6	37
Shops in houses	0	0	0
Total	**1**	**6**	**37**

Source: Field Survey

(2) Mahendergarh

A total number of 96 Project Affected Families (PAFs) and approximately 381 PAPs from 59 private structures is the target of involuntary resettlement in the built up area. It is also observed that 2 affected families in residential com commercial structures will not only lose their residences but also means on their livelihood, e.g. 4 shops in residences. The impact found in this district is insignificant Table5-8 provides details of impact on private structures in Mahendragarh District.

1) Pre-construction and Construction Phase

- A total no. of 4 structures includes houses, residential cum commercial structures and shops in houses are the target of involuntary resettlement thus making it an insignificant impact.

2) Mitigation Measures

- Reconstruction of structures and relocation to new sites or cash compensation to be given to affected family before the start of the project
- Refund of registration cost, stamp etc. incurred for replacement land to be paid by the project

Positive Impacts

- Increase business opportunities for the local people in terms of transporting their products in the future.

Table 5-8 Impact on Private Structures in Mahendergarh

Type of Structure	Number of structures	Number of PAFs	Number of PAPs
Houses	55	96	381
Residential cum comm.	0	0	0
Shops in houses	4	0	0
Total	**59**	**96**	**381**

Source: Field Survey

5.4.4 Impact Due to Land Acquisition

DFC project will acquire approximately 84.4 ha and 112.5 ha of land to create facilities , infrastructure and other facilities in Rewari and Mahendergarh district respectively. Total number of 9 and 24 affected villages in two districts is found where 99 percent agricultural land would be acquired for the project.

(1) Pre-construction Phase

- Diversion out-lined through agricultural areas would bisect the existing coherent agricultural communities;
- Vegetation including large trees grown along the railway would be impacted.

(2) Construction and Post Construction Phase

Negative Impact

- Number of farmers would become subject to involuntary changes of occupation.

Positive Impact

- Inter city rapid passenger service will be possible by shortening the travel time because of the exclusive use of the new line for passenger service.

Mitigation Measures

- Replacement of agriculture land or appropriate compensation to the PAFs
- One person in each affected family to be given the job as per eligibility or livelihood restoration training programme to be given

5.4.5 Inducement of Land Speculation and Squatter Influx

This type of impact is expected between planning and final land acquisition process due to purchase of land at marginal price by rich landlords and encroachment by squatter particularly in urban fringe area in anticipation of getting higher compensation. In Rewari and Mahendergarh District, there are no squatters found on the entire corridor as given in Table 5.9.

Table 5-9 Squatters in Rewari and Mahendergarh Districts

S. No	District	Type of Squatters	Total Number
1	Rewari	0	0
2	Mahendergarh	0	0

Source: Field Survey

5.4.6 Removal of Encroachments and Squatter Influx

No encroachment is noticed in Rewari and Mahendergarh District. Therefore, there would be no impact on the livelihood and other related aspects of the encroachers and squatters.

Table 5-10 Loss of Residence in Rewari and Mahendergarh Districts

Impact	No of Squatters/Encroachers		Total Number	
	Rewari	Mahendergarh	Rewari	Mahendergarh
Loss of residential place	0	0	0	0
Loss of livelihood	0	0	0	0
Increase distance from their work place	0	0	0	0

Source: Field Survey

5.4.7 Loss of Utilities and Amenities

The public utilities like water pipelines, irrigation facilities, gas pipelines, transmission towers will not be affected by the DFC project. However, three wells/ hand pump are likely to be affected in Kharagwas and Chandwas village in Rewari in the parallel section of the corridor. Table 5-11 shows that there is negligible loss due to land acquisition for the project activities. However 1wells/ hand pump are likely to be affected in Uninda village in Mahendergarh in the parallel section of the corridor. Table 5-12 shows that there is negligible loss due to land acquisition for the project activities.

Table 5-11 Loss of Utilities and Amenities District Rewari

Section	Name of village	Water Pipeline	Irrigation Facilities	Gas Pipeline	Transmission Tower	Well/ Hand Pump	Others
Parallel	Kharagwas	0	0	0	0	1	0
Parallel	Chandwas	0	0	0	0	2	0
Total		0	0	0	0	3	0

Source: Field Survey

Table 5-12 Loss of Utilities and Amenities District Mahendragarh

Section	Name of village	Water Pipeline	Irrigation Facilities	Gas Pipeline	Transmission Tower	Well/ Hand Pump	Others
Parallel	Uninda	0	0	0	0	1	0
Total		0	0	0	0	1	0

Source: Field Survey

5.4.8 Impact on Vulnerable Section

Vulnerable section includes Women Headed Households (WHH), SC/ST and physically and mentally handicap persons. It is observed that there is no impact on this category (Table 5-13).

Table 5-13 Vulnerable Structures in Rewari and Mahendergarh

Category	PAFs	PAPs	Total Number
Women Headed Household	0	0	0
SC	0	0	0
ST	0	0	0
Physically and Mentally Handicap	0	0	0
Total Number	0	0	0

Source: Field Survey

5.4.9 Severance and Access

The severance and loss of accessibility is due to widening along parallel section or obstruction in accessibility due to construction of detours and bisecting of habitation etc. In Rewari district, no such impact was observed, however, there would be negligible impact in accessibility of other villages during the construction period. Therefore, temporary roads may be helpful in accessing site during construction

(1) Public Health and Safety

During construction period, health condition of the people may deteriorate due to unsanitary condition of stations and railway toilets resulting in public health problems like spread of malaria, respiratory problems and other contagious diseases. Due to insecure and unhealthy practices during the construction period, STD, HIV/AIDS diseases may spread.

Solid waste disposed by the construction works as well as noise, vibration and dust emanating during the construction period would adversely affect the local community.

Mitigation Measures

- Safety aspects with fast train on DFC Corridor are major issues and adequate safety provisions should be integrated with design.

5.4.10 Impact on Sensitive Community Facilities

Among community properties, one school, 3 wells/hand pumps and 3Temple are likely to be affected in Rewari District. Among community properties, one school, 1 wells / hand pumps and 2 Temple are likely to be affected in Mahendragarh District. Overall impact on community facilities is however negligible Table 5-14 shows the impact on community facilities.

(1) Pre-construction and Construction Phase

- Total number of 8 community properties is the target of resettlement impact in Rewari and 4 in Mahendergarh district.
- Religious properties are the concerns of peoples' sentiments

Mitigation Measures

- Restoration of Community Resources/Facilities

Table 5-14 Impact on Community Facilities in District Rewari

Section	Name of village	Temple/ Mosque/ Church	Graveyard/ Crematorium	Well/ Hand Pump	Community Building	Police Station/ Govt. Offices	Health Facilities	Schools/ Educational Institute	Others
Parallel	Padala	0	0	0	0	0	0	0	1
Parallel	Kharagwas	0	0	1	0	0	0	0	0
Parallel	Chandwas	1	0	2	0	0	0	1	0
Detour	Kaluwas	1	0	0	0	0	0	0	0
Detour	Dhoki	1	0	0	0	0	0	0	0
Total		3	0	3	0	0	0	1	1

Source: Field Survey

Table 5-15 Impact on Community Facilities in District Mahendragarh

Section	Name of village	Temple/ Mosque/ Church	Graveyard/ Crematorium	Well/ Hand Pump	Community Building	Police Station/ Govt. Offices	Health Facilities	Schools/ Educational Institute	Others
Parallel	Uninda	0	0	1	1	0	0	0	0
Parallel	Napala	1	0	0	0	0	0	0	0
Parallel	Narnaul	1	0	0	0	0	0	1	0
Total		2	0	1	0	0	0	1	0

Source: Field Survey

5.4.11 Impact on Local Economy/ Employment & Livelihood

Although the impact on local economy/employment is negligible, however, it is noticeable that agriculture is the main occupation of the affected people. About 90% of the work force is dependent on agriculture and related activities and depend upon agriculture for their livelihood.

(1) Pre construction and construction phase

Negative Impact

Agriculture being the main livelihood, the affected persons would lose their source of livelihood and become subject to involuntary changes of occupation.

Mitigation Measures

- Employment in the construction work
- Livelihood restoration training programme
- One member in each affected family-losing livelihood should be given job as per eligibility

Positive Impacts

- The project will generate tremendous requirement for the collection of goods for transportation in bulk to the freight corridor lifting points and offloading points for their carriage to the destination points. This will require more transporters and transport workers leading to the growth of this sector creating a number of feeder corridors and its associated local employment. The requirement of carriage of goods and services will need more workers and trucks and also open up tremendous opportunities in a number of diversified sectors due to the technical and operational requirements of the Freight Corridor Project.
- The Project could contribute to the local economy as local residents could enjoy a temporary period of improvement of small-scale business for the construction workers as well as to seize the opportunity for casual labour.

(2) Post Construction Period

Positive Impact

- Ever increasing local business in district would significantly benefit for their business opportunities in terms of transporting their products in the future.

5.4.12 Social Impact Matrix

Social Impact matrix is presented in Table 5-16 and Table 5-17.

Table 5-16 Social Impact Matrix

No.	Items	Overall Evaluation on the Project	Pre-construction Stage			Construction Stage											
			Surveying of Planned Areas and Sites	Selection of the Project Location and Sites	Land Acquisition and Resettlement	Extraction of Building Materials (stones, aggregates, sand, soil, etc.) at Quarries and Borrow Areas	Earth Moving: Cutting and Filling of the Construction Works	Preparation of Construction Plants, and Warehouses, Work Camps, etc.	Operation of Construction Plants, Machines and Vehicles for Construction Works	Construction Works for railway line and related structures						Localized Employment Opportunities of the Construction Works	Localized Business Opportunities Related to the Construction Works
										(A) Construction Works for Railway Lines and Installation of Related Facilities (signals, rails, etc.)	(B) Construction Works for ICDs and Freight Logistic Parks	(C) Construction Works for Stations (Terminal, Junction and Crossing)	(D) Construction Works for ROBs and RUBs	(E) Construction Works for Bridges	(F) Construction Works for Tunnels		
Social Environment																	
1	Involuntary Resettlement																
	a. General People	B-	D-	D-	B-	B-	B-	B-	B-	B-	B-	B-	D-	B-	E	B-	B-
	b. Socially and Physically Disadvantaged	B-	D-	D-	B-	B-	B-	B-	B-	B-	B-	B-	D-	B-	E	B-	B-
	c. Minorities and Scheduled Castes/Tribes	B-	D-	D-	B-	B-	B-	B-	B-	B-	B-	B-	D-	B-	E	B-	B-
2	Local Economy such as Employment and Livelihood etc.	B-	D-	B+	B-	B+	B+	B+	B+	B+	D-	B+	D-	D-	E	B+	B+
3	Land Use and Utilization of Local Resources	B-	D-	D-	B-	B-	B-	B-	B-	B-	B-	B-	D-	D-	E	B-	B-
4	Social Institutions, Social Infrastructures and Local Decision-making Process	B-	B-	B-	B-	D-	D-	D-	D-	D-	D-	B-	D-	D-	E	D-	D-
5	Existing Infrastructures and Services	B+	D-	D-	B+	B+	B-	B+	B+	B+	B+	B+	E	B+	E	B+	B+
6	Vulnerable Social Groups such as the Poor and Indigenous People																
	a. Households below the Poverty Line	B+	B+	B+	B+	D-	D-	B+	B+	D-	D-	B+	E	B+	E	B+	B+
	b. Scheduled Castes and Tribes	B+	B+	B+	B+	D-	D-	B+	B+	D-	D-	B+	E	B+	E	B+	B+
7	Gender	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
8	Children's Rights	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
9	Distribution of Benefits and Losses and Equality in the Development Process	B-	B-	B-	B-	D-	D-	D-	D-	B-	B-	B-	D-	D-	E	B-	B-
10	Local Conflict of Interests	B-	B-	B-	B-	B-	B-	B-	D-	D-	D-	B-	D-	D-	E	B-	B-
11	Cultural Property and Heritage	B-	B-	B-	B-	D-	D-	D-	D-	B-	D-	B-	D-	D-	E	E	E
12	Public Health Conditions																
	a. Infectious Diseases (including HIV/AIDS)	B-	D-	D-	D-	B-	B-	B-	B-	B-	B-	B-	E	D-	E	D-	D-
	b. Other Health Problems																
13	Water Rights/Rights of Common Land	B-	D-	D-	D-	B-	B-	B-	B-	B-	B-	B-	D-	B-	E	E	B-
14	Hazards and Risk																
	a. Traffic Accidents	B-	B-	B-	B-	B-	B-	B-	B-	B-	B-	B-	B-	D-	B-	D-	D-
	b. Natural Hazards	B-	B-	B-	B-	B-	B-	B-	B-	B-	D-	B-	D-	B-	E	D-	D-

Note: A: Significant impact, B: Relatively Significant impact, C: Insignificant impact, D: Neglectable impact, E: No impact, + Positive, - Negative.

Table 5- 17 Social Impact Matrix (Post Construction Phase)

No.	Items	Post Construction Stage									
		Overall Evaluation on the Project	Traffic Conditions of Freight Trains	Logistic Condition of Goods, Raw Materials, Agricultural and Industrial Products	Traffic Condition of Roads	Operation and Maintenance of Railway lines and Related Structures	Employment Opportunities (whole country/local level)	Freight-oriented Business Opportunities	Passenger Oriented Business Opportunities	Promoting Development of Surrounding Area	Increase in Settlers and Visitors to the Project Area
Social Environment											
1	Involuntary Resettlement										
	a. General People	B-	D-	B-	B-	E	B-	B-	D-	B-	B-
	b. Socially and Physically Disadvantaged	B-	D-	B-	B-	E	B-	B-	D-	B-	B-
	c. Minorities and Scheduled Castes/Tribes	B-	D-	B-	B-	E	B-	B-	D-	B-	B-
2	Local Economy such as Employment and Livelihood etc.	B+	D-	B+	D-	E	D-	B+	D-	B+	D-
3	Land Use and Utilization of Local Resources	B-	D-	B-	B-	B-	B-	B-	D-	B-	D-
4	Social Institutions, Social Infrastructures and Local Decision-making Process	B-	D-	D-	D-	D-	B-	D-	D-	B-	E
5	Existing Infrastructures and Services	B+	B+	B+	B+	B+	B+	B+	D-	B+	D-
6	Vulnerable Social Groups such as the Poor and Indigenous People										
	a. Households below the Poverty Line	B+	B+	D-	D-	E	B+	B+	D-	B+	D-
	b. Scheduled Castes and Tribes	B+	B+	D-	D-	E	E	B+	D-	B+	B+
7	Gender	E	E	E	E	E	E	E	E	E	E
8	Children's Rights	E	E	E	E	E	E	E	E	E	E
9	Distribution of Benefits and Losses and Equality in the Development Process	B-	B-	B-	B-	D-	B-	B-	D-	B-	D-
10	Local Conflict of Interests	B-	B-	D-	B-	D-	B-	B-	D-	B-	D-
11	Cultural Property and Heritage	B-	B-	D-	B-	B-	E	E	E	B-	E
12	Public Health Conditions										
	a. Infectious Diseases (including HIV/AIDS)	E	E	E	E	E	E	E	E	E	E
	b. Other Health Problems										
13	Water Rights/Rights of Common Land	B-	D-	B-	B-	D-	E	B-	D-	B-	E
14	Hazards and Risk										
	a. Traffic Accidents	B-	B-	D-	B-	B-	D-	D-	D-	D-	D-
	b. Natural Hazards	D-	D-	D-	D-	D-	D-	D-	D-	D-	D-

Note: A: Significant impact, B: Relatively Significant impact, C: Insignificant impact,
D: Neglectable impact, E: No impact,

Scaling of Impacts on Social environment due to DFC project in Haryana					
Sl. No	Socio Environment Contents	Scaling	Reasons (during construction phase)	Reasons (during construction phase)	Reasons (after-construction phase)
1	Involuntary resettlement	B-/ D	B-during pre construction phase some people (approximately 528)are likely to be affected out of these(Most of them are brick line worker), some people will have to be involuntary resettled	B-during construction phase some people are likely to be affected out of these, some people will have to be involuntary resettled	D-: During operation phase it is likely to have negligible impact.
2	Local Economy	B-	B- during pre construction phase, project related activities would enhance the economic development of the local area.	B- During construction phase economy will have more positive effect, as the local business will be augmented in the local area and temporary employment opportunities will be generated.	B-Local economy is supposed to be boosted in Rewari as the proposed Junction station will play catalyst role in industrial development of the area.
3	Land Use and utilization of local resources	B/D	D- During construction phase local resources will be utilized, specially of Rewari town.(2) Land use pattern will have nearly no impact.	C-During construction phase local resources will be utilized, especially of Rewari town. (2) D -Land use pattern will have nearly no impact.	D- Only marginal impact is supposed to be felt.

Scaling of Impacts on Social environment due to DFC project in Haryana					
Sl. No	Socio Environment Contents	Scaling	Reasons (during construction phase)	Reasons (during construction phase)	Reasons (after-construction phase)
4	Social institution, social infrastructures and local decision making process	D-	D- it will have nearly no impact.	D- It will have only marginal impact as the social institutions are not getting affected at large.	D-It is likely to have no significant impact.
5	Existing infrastructure and services	B-	B-Existing infrastructure will be developed in the proximity of Junction station and crossing station sites.	B-: Existing infrastructure will be developed as the construction of approach roads other facilities will be developed.	(1)B-: Overall economy development will positively affect the infrastructure development.
6	Vulnerable social groups such as poor and indigenous people	B/D	C-: Temporary employment will benefit the livelihood of deprived/ vulnerable group. (2) D - Few structures are likely to be affected so overall impact on these groups will be marginal.	B-: Temporary employment will benefit the livelihood of deprived/ vulnerable group.	D- Only marginal impact is supposed to be felt.
7	Gender	D-	(1) D-: No Impact is likely to be felt.	(1) D-: No Impact is likely to be felt.	(1) D-: No Impact is likely to be felt.
8	Children Rights	D-	(1) D-: No Impact is likely to be felt.	(1) D-: No Impact is likely to be felt.	(1) D-: No Impact is likely to be felt.
9	Distribution of benefits and losses and equaliy in the development process	C/D	C-: Benefits and losses effects are likely to be felt equally by all groups of local community.	C-: Benefits and losses effects are likely to be felt equally by all groups of local community	D- Only marginal impact is supposed to be felt.
10	Local Conflict of interest	C/D	C-Some problems regarding alignment generated marginal problems among local groups of rural and urban area .it will show maximum effect during pre construction phase .	C-Some problems regarding alignment generated marginal problems among local groups of rural and urban area.	D-Only marginal impact is supposed to be felt.
11	Cultural property and Heritage	D-	D- No significant impact is likely to take place.	D-Only marginal impact is supposed to be felt as only few (2 Temples-one in Kaluwas and another on in dhoki) is likely to be affected.	D-Only marginal impact is supposed to be felt as only few (2 Temples-one in Kaluwas and another on in dhoki) is likely to be affected and no heritage property is supposed to be affected.
12	Public Health	C/D	D- No significant impact is likely to take place.	C-(1) During construction phase because of increased dust percentage and NOX quantity etc, increased noise and vibration level. in the local surroundings , marginal impact will be felt.(2)D- Slight increase in chances of spreading infectious disease.	D- Only marginal impact is supposed to be felt because of increased noise and vibration level.
13	Water Rights / rights of common land	D-	D- No significant impact is likely to take place.	D - Water rights will have no impacts and common land (Grass land etc.) also do not have any impact.	D -Insignificant impact is likely to be felt.
	Hazard and Risk	C/D	D- No significant impact is likely to take place.	1) C- During construction phase risk of accidents related to traffic and other kind is likely to increase.	D -Insignificant impact is likely to be felt.

5.5 POLLUTION CONTROL

5.5.1 Introduction

The Central Pollution Control Board (CPCB) is the statutory organization responsible to prevent and control pollution. It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. State Pollution Control Board (SPCB) plays the role in environmental management at the state level.

Pollution Control study involves monitoring of Noise and Vibration along the Proposed DFC at selected Sensitive Receptors. The interview survey has been undertaken to get local people perception about the environmental quality. Secondary data has been reviewed, however the availability of secondary data is limited with reference to Environmental Quality. Data sheets used in the study are given in the annex.

5.5.2 Existing Condition

(1) Air Quality

Air pollution encompasses a diverse array of natural and anthropogenic emission including gaseous constituents, volatile chemicals aerosols and their atmospheric reaction products

Secondary data on air quality is not available for Mahendragarh or Rewari district; however, the general condition of air quality is good along alignment as no industries and factories are located and agriculture is the main source of economy in this region.

The air quality standards prescribed by CPCB are given in the Table 5-18.

Table 5-18 Ambient Air Quality Standard

Pollutant	Sulphur Dioxide		Oxides of Nitrogen		Suspended Particulate matter		Carbon Monoxide	
Time Weighted	Annual Average	24 Hours Average	Annual Average	24 Hours Average	Annual Average	24 Hours Average	8 Hours	1 Hours
Industrial Area	80 $\mu g/m^3$	120 $\mu g/m^3$	80 $\mu g/m^3$	120 $\mu g/m^3$	360 $\mu g/m^3$	500 $\mu g/m^3$	5.0 mg/m^3	10.0 mg/m^3
Residential Area	60 $\mu g/m^3$	80 $\mu g/m^3$	60 $\mu g/m^3$	80 $\mu g/m^3$	140 $\mu g/m^3$	200 $\mu g/m^3$	2.0 mg/m^3	4.0 mg/m^3
Sensitive area	15 $\mu g/m^3$	30 $\mu g/m^3$	15 $\mu g/m^3$	30 $\mu g/m^3$	70 $\mu g/m^3$	100 $\mu g/m^3$	1.0 mg/m^3	2.0 mg/m^3

Source: Central Pollution Control Board

(2) Water Quality

Ground Water Analysis

Rain and river water percolates through the soil and sandy riverbeds to reach a hard stratum. Percolated water gets accumulated in large pools and called aquifers containing groundwater. This forms ground water. Soil texture and gradient of the area are the two major factors governing percolation, recharging aquifers.

There is a vast potential for utilizing the ground water throughout the state of Haryana. At present, ground water is the only source of drinking, irrigation etc in the study area. People use hand pumps; open wells or bore wells to draw water from ground. Ground water samples were collected from open well and were analyzed.

The ground water quality in the study area is quite good and suitable for drinking purpose without any treatment (Tables 5-19 and 5-20). The water quality fully conforms to the standards laid down by WHO & BIS for drinking purpose.

Table 5-19 Ground water analysis of Mahendragarh district

Sl. No.	Parameter	Units of Measurements	Value	Prescribed Limits	Protocol
1	pH		7.68	6.5-8.5	IS:3025
2	Dissolved Oxygen	mg/L	-	-	IS:3025
3	Conductivity	Micromho/cm	302	-	IS:3025
4	Total Suspended Solids	mg/L	4		IS:3025
5	Total Dissolved Solids	mg/L	262	500-2000	IS:3025
6	Alkalinity as $CaCO_3$	mg/L	146	200-600	IS:3025
7	Total Hardness as $CaCO_3$	mg/L	90	300-600	IS:3025
8	Calcium as $CaCO_3$	mg/L	80	75-200	IS:3025
9	Magnesium as $CaCO_3$	mg/L	10	30-100	IS:3025
10	Sodium	mg/L	15	-	IS:3025
11	Potassium	mg/L	01	-	IS:3025
12	Chloride	mg/L	11	250-1000	IS:3025
13	Phosphate	mg/L	0.08	-	IS:3025
14	Sulphate	mg/L	25	200-400	IS:3025
15	Nitrate	mg/L	Nill	45	IS:3025
16	Oil & Grease	mg/L	-	-	IS:3025
17	Silica	mg/L	-	-	IS:3025
18	Phenolic Compounds	mg/L	-	-	IS:3025
19	Chemical Oxygen Demand	mg/L	-	-	IS:3025
20	Biological Oxygen Demand	mg/L	-	-	IS:3025
21	Arsenic	mg/L	-	0.01	APHA
22	Mercury	mg/L	-	0.001	APHA
23	Lead	mg/L	-	0.05	APHA
24	Cadmium	mg/L	-	0.01	APHA
25	Hexavalent Chromium	mg/L	-	0.05	APHA
26	Copper	mg/L	-	0.05	APHA
27	Zinc	mg/L	-	5	APHA
28	Selenium	mg/L	-	0.01	APHA
29	Iron	mg/L	-	0.3	APHA

Source: Field Data Survey

Table 5-20 Ground Water Analysis of Rewari District

Sl. No.	Parameter	Units of Measurements	Value	Prescribed Limits	Protocol
1	pH		7.68	6.5-8.5	IS:3025
2	Dissolved Oxygen	mg/L	-	-	IS:3025
3	Conductivity	Micromho/cm	302	-	IS:3025
4	Total Suspended Solids	mg/L	4		IS:3025
5	Total Dissolved Solids	mg/L	262	500-2000	IS:3025
6	Alkalinity as $CaCO_3$	mg/L	146	200-600	IS:3025
7	Total Hardness as $CaCO_3$	mg/L	90	300-600	IS:3025
8	Calcium as $CaCO_3$	mg/L	80	75-200	IS:3025
9	Magnesium as $CaCO_3$	mg/L	10	30-100	IS:3025
10	Sodium	mg/L	15	-	IS:3025
11	Potassium	mg/L	01	-	IS:3025
12	Chloride	mg/L	11	250-1000	IS:3025
13	Phosphate	mg/L	0.08	-	IS:3025
14	Sulphate	mg/L	25	200-400	IS:3025
15	Nitrate	mg/L	Nill	45	IS:3025
16	Oil & Grease	mg/L	-	-	IS:3025
17	Silica	mg/L	-	-	IS:3025
18	Phenolic Compounds	mg/L	-	-	IS:3025
19	Chemical Oxygen Demand	mg/L	-	-	IS:3025

Sl. No.	Parameter	Units of Measurements	Value	Prescribed Limits	Protocol
20	Biological Oxygen Demand	mg/L	-	-	IS:3025
21	Arsenic	mg/L	-	0.01	APHA
22	Mercury	mg/L	-	0.001	APHA
23	Lead	mg/L	-	0.05	APHA
24	Cadmium	mg/L	-	0.01	APHA
25	Hexavalent Chromium	mg/L	-	0.05	APHA
26	Copper	mg/L	-	0.05	APHA
27	Zinc	mg/L	-	5	APHA
28	Selenium	mg/L	-	0.01	APHA
29	Iron	mg/L	-	0.3	APHA

Source: Field Data Survey

Surface Water Analysis

There is no river flowing in the study area. Surface water sources mainly consist of ponds, canal etc. A representative sample was collected from a canal near Jhajjar crossing.

Table 5-21 Surface Water Analysis of Rewari District (near Jhajjar Crossing)

Sl. No.	Parameter	Units of Measurements	Value	Prescribed Limits	Protocol
1	pH		7.38	6.5-8.5	IS:3025
2	Dissolved Oxygen	mg/L	-	-	IS:3025
3	Conductivity	Micromho /cm	250	-	IS:3025
4	Total Suspended Solids	mg/L	Nill		IS:3025
5	Total Dissolved Solids	mg/L	1408	500-2000	IS:3025
6	Alkalinity as $CaCO_3$	mg/L	389	200-600	IS:3025
7	Total Hardness as $CaCO_3$	mg/L	680	300-600	IS:3025
8	Calcium as $CaCO_3$	mg/L	194	75-200	IS:3025
9	Magnesium as $CaCO_3$	mg/L	486	30-100	IS:3025
10	Sodium	mg/L	300	-	IS:3025
11	Potassium	mg/L	20	-	IS:3025
12	Chloride	mg/L	377	250-1000	IS:3025
13	Phosphate	mg/L	0.01	-	IS:3025
14	Sulphate	mg/L	112	200-400	IS:3025
15	Nitrate	mg/L	Nill	45	IS:3025
16	Oil & Grease	mg/L	-	-	IS:3025
17	Silica	mg/L	-	-	IS:3025
18	Phenolic Compounds	mg/L	-	-	IS:3025
19	Chemical Oxygen Demand	mg/L	-	-	IS:3025
20	Biological Oxygen Demand	mg/L	-	-	IS:3025
21	Arsenic	mg/L	-	0.01	APHA
22	Mercury	mg/L	-	0.001	APHA
23	Lead	mg/L	-	0.05	APHA
24	Cadmium	mg/L	-	0.01	APHA
25	Hexavalent Chromium	mg/L	-	0.05	APHA
26	Copper	mg/L	-	0.05	APHA
27	Zinc	mg/L	-	5	APHA
28	Selenium	mg/L	-	0.01	APHA
29	Iron	mg/L	-	0.3	APHA

Source: Field Data Survey

Primary water quality criteria for designated-best-use-classes are given in the table below.

Table 5-22 Water Quality Criteria Prescribed by CPCB

Designated-Best-Use	Class of water	Criteria
Drinking Water source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100mL shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/L or more Biochemical Oxygen Demand 5 days 20^{o}C 2mg/L or less
Out door Bathing	B	Total Coliforms Organism MPN/100mL shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/L or more Biochemical Oxygen Demand 5 days 20^{o}C 3mg/L or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100mL shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/L or more Biochemical Oxygen Demand 5 days 20^{o}C 3mg/L or less
Propagation of wildlife and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/L or more Free Ammonia (as N)1.2 mg/L or less
Irrigation, industrial cooling, controlled waste disposal	E	pH between 6.0 to 8.5 Electrical conductivity at 25^{o}C michro mhos/cm max. 2250 Sodium absorption ratio max. 26 Boron max. 2mg/L

Source: Central Pollution Control Board

(3) Soil

Soil is the sustainer of life in our environment. Soil, which is the upper crust of earth, is of significance for all the vegetation, including crops on it. The Study area has very light soils (sandy and loamy sand) and the light soils (relatively sandy loam).

Mahendragarh is entirely covered by alluvial deposits, which consist of clay and sand with Kankar. Locally beds of gravel and cemented sands are occasionally present with the unconsolidated sands. The soils are alkaline in nature. The soils are deficient in nitrogen and organic matter. Within the alluvial tract occur the saline and alkaline soils.

The district of Rewari is characterized by the soils belonging to two moisture regimes, i.e., Ustic (6.7%) and Aridic (1.4%). Dominant soils of Ustic zone are deep, excessively drained, sandy and alkaline are classified as Typic Ustipsamments and associated soils as Typic Ustochrepts. Soils of Aridic zone are sandy and alkaline and classified as Typic Torripsamments and associated soils and Typic Camborthids.

(4) Solid Waste

Solid waste can be classified into different types depending on their source:

(a) Domestic or Household waste is generally classified as municipal waste,

(b) Industrial waste as hazardous waste, and

(c) Biomedical waste or hospital waste as infectious waste.

Waste management in Haryana has not kept pace with the increasing quantities of municipal solid waste, industrial hazardous wastes and bio-medical waste, which results in waste problems listed below:

(a) High proportion of uncollected waste; and

(b) Poor standards of transportation, storage, treatment and disposal, that lead to land and

groundwater pollution.

The district generates significant quantity of solid waste from the urban areas and various agriculture related industries like the rice mills, cold storage, etc.

(5) Noise

Secondary data on noise is not available; however, the general observation shows that noise is higher in the urban areas (town) whereas outside city it is low. The analysis of monitoring conducted at sensitive receptors along the railway line shows that noise is higher during day hours. The ambient Noise Standards are given in Table 5-23.

Table 5-23 Ambient Air Quality Standards in Respect of Noise

Area code	Category of Area / Zone	Limits in dB(L_{Aeq})*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

* dB(L_{Aeq}) denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Note1. Daytime shall mean from 6.00 to 22:00.

2. Night time shall mean from 22:00 to 6.00.

3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority

(6) Vibration

No secondary data is available on vibration; however, a vibration monitoring has been conducted at the Sensitive Receptors along the railway and the analysis of data shows that vibration is higher than the permissible limit.

(7) Ground Subsidence

No incidence of ground subsidence has been reported from the district.

5.5.3 Potential Environmental Impact Evaluation and Mitigation Measures (Pollution)

Potential environmental impact evaluation involves prediction of potential impacts by the development of the project on the surrounding area. Based on baseline environmental status described and proposed project activities, potential impacts have been assessed and predicted and appropriate mitigation measures are suggested to avoid/reduce/compensate the potential adverse impacts and enhance the positive impacts. The impacts due to development of the proposed DFC are assessed as shown below:

(a) Pre Construction Phase;

(b) Construction Phase; and

(c) Operation Phase

Within the framework of DFC Project study, a simple method that determines potential existence of impact has been employed. Matrix system is considered as a tool for organizing and presenting information on the environmental impacts caused to the natural and social environment by the DFC Project. The parameter and scale is used for producing matrix impacts (Table 5-24).

Table 5-24 Parameter and Scale of Impact Matrix

Parameter	Scale		Remarks
Significance	No impact	E	Positive : + Negative : -
	Negligible impact	D	Positive : + Negative : -
	Insignificant impact	C	Positive : + Negative : -
	Relatively significant impact	B	Positive : + Negative : -
	Significant impact	A	Positive : + Negative : -

The Environmental Impact Matrix is given in Tables 5-24.

(1) Impact on Air Quality

1) Construction Phase

During Construction phase, the air quality is likely to be affected due to generation of dust from construction activities and gaseous emission from construction vehicle. However, the impact will be localized, short-termed and reversible.

Mitigation Measures

- Adequate dust suppression measures such as regular water sprinkling on construction sites, haul and unpaved roads particularly near habitation will be undertaken to control fugitive dust
- Plantation activity may be undertaken at the construction sites
- Workers may be provided with mask to prevent breathing problems
- Trucks carrying soil, sand and stone may be duly covered to avoid spilling.
- Low emission construction equipment, vehicles and generator sets may be used
- Air quality monitoring may be conducted at construction sites.
- Impact on air quality is likely to be temporary and reversible.

(2) Operation Phase

During operation phase, the impacts on air quality are shown below:

- The air quality of the area is likely to be improved. Currently the cargo is transported by railway and road. It is estimated that one litre of fuel can move 24 ton-km of freight by road, 85 ton- km by rail. Therefore, once the DFC is active in the area the consumption of fuel is likely to decrease which may subsequently decrease emission in the area.
- Plantation along the DFC is likely to improve the air quality of the area.

Mitigation Measures

- Air Quality should be monitored during operation phase complying CPCB guidelines.

(3) Impact on Water Quality

1) Construction Phase

- There would not be any significant impact on the surface water quality due to the activities during construction phase. However, there will be some impact on the ground water quality as the water table in this area is high and water logging problem is also prevalent in some low lying areas.

- The activities, which are likely to impact water quality, are surface run-off from construction sites, spillage & leakage from construction equipments and sewage generated from construction camps. These activities may result in short-term mild reversible impact on water quality.
- The water quality of the irrigational canals crossing the DFC is also likely to be affected; however, this will be temporary and for short duration.
- The impact on water quality will be localized and reversible, suspended particulate matter tends to settle down in due course of time.

Mitigation Measures

- Silt fencing may be provided near water bodies to avoid spillage of construction material.
- Discharge of waste from construction/labour camp into water bodies may be strictly prohibited.
- Construction methodologies with minimum or no impact on water quality may be adopted. Disposal of construction wastes at designated sites and adequate drainage system may be provided.
- Project design may take care of irrigation canal and proper culverts may be provided so that irrigation setup is not disturbed.
- Construction activity may be prohibited during rainy season near water bodies.
- Water quality monitoring may be conducted during construction phase.

2) Operation Phase

- During operation phase no impact is envisaged on water bodies as adequate design provision will be made for proper discharge of waste water.

(4) Impact on Soil

1) Construction Phase

- During construction phase soil contamination is likely to take place due to leakage of asphalt emulsifier at pavement of road.
- Soil contamination may also take place during filling of oil in vehicles or leakage from vehicles.

Mitigation Measures

- Asphalt emulsifier must be handled with caution and any leakage detected must be immediately rectified.
- Construction work should not be done during rainy season to avoid erosion and spreading of loose material.
- Top soil removed during excavation work should be stored separately in the bunded area and should be utilized during plantation or refilling of excavated area.

2) Operation Phase

- During operation phase no impact is envisaged on soil.

(5) Solid Waste

1) Construction Phase

- Solid waste is likely to be generated due to extraction of building materials, earth moving, and operation of construction plant and construction of railway related structures.

- Construction camp is also likely to generate solid waste and pollute the area.

Mitigation Measures

- Construction work must be carried in such a way that minimum or no solid waste is generated at construction site. Extra earth material produced may be utilized for refilling of borrow areas.
- Rainy season may be avoided to minimize spreading of loose materials.
- Solid waste management may be framed for camp areas. Dustbins may be provided in the camps.
- The Contractor must provide proper sanitation facilities in camps.

2) Operation Phase

- Solid waste may be generated during operation phase due to the operation of freight train and related facilities.

Mitigation Measures

- Solid waste management program must be framed for operation phase. Excess of material generated must be disposed in eco-friendly manner.
- Biodegradable and non-biodegradable waste must be collected separately.
- Regular cleaning must be conducted at ICD and at Stations.

(6) Noise and Vibration

1) Construction Phase

- Noise is likely to be generated due to various construction activities such as movement of construction vehicles, machineries and equipments, extraction of building materials, earth moving, and construction works of railway and related structures.
- The noise level is likely to rise; however, such exposure shall not occur for long period, the noise shall be intermittent, temporary and limited to construction site only.

Mitigation Measures

- Low noise producing modern technologies may be used during construction.
- Construction equipment's and vehicles must be in good working condition, properly lubricated and maintained to keep noise within permissible limit.
- Temporary noise barriers installed at settlements and forest area, if required.
- Plantation may be carried at the work site.
- Head phones, ear plugs be provided to the workers at construction site.
- Noise level monitoring must conducted during construction phase.
- The construction methods with lower vibration generation shall be applied.
- Machines and vehicles equipped with lower vibration devices such as vibration-proofing cover shall be used.
- Vibration propagation shall be prevented by keeping the distance and changing the direction and location of machines.
- Near settlement and forest areas, construction activities shall be conducted only during daytime, and vibration generating activities shall be prohibited during night time.
- Vibration level monitoring shall be conducted during the construction phase.

2) Operation Phase

- During operation phase noise and vibration are likely to occur due to due to movement of trains and related facilities such as loading and unloading.

Mitigation Measures

- Plantation must be maintained along DFC corridor.
- New technologies shall be incorporated to lower vibration generation with respect to structures and rolling stocks.
- Use of long welded rails without fishplate joint is suggested for reduction in vibration.
- Crushed stones shall be used for ballast materials, and accumulation of crushed ballast by passing trains is to be removed through frequent ballast cleaning.
- For a railway bridge girder, steel may be replaced with concrete materials such as PC and RC to minimise oscillation of the bridge girder which generates vibration in addition to noise.
- If necessary, building the vibration-proof trench and underground wall may be built to prevent the vibration propagation.
- Provide appropriate maintenance of locomotives, tracks and structures.
- Running speed of freight trains in the urban area and the railway station shall be controlled, if required.
- Fences and structures to shelter and absorb vibration in addition to noise are duly provided to the sections where houses and Sensitive Receptors are located near railway tracks, if required.
- Monitoring of railway noise and vibration generated from dedicated freight trains shall be conducted.

(7) Land Subsidence

1) Construction Phase

- Land subsidence is not envisaged as the project area is plain except the detour section where it traverses through undulating stretch.
- Soil erosion may take place in the undulating section; however, the impact will be insignificant.

Mitigation Measures

- Plantation must be carried to control erosion.

2) Operation Phase

- During operation phase no impact is envisaged on land subsidence.

(8) Bottom Sediment

1) Construction Phase

- The DFC alignment crosses Perennial River; during construction sediment pollution may occur. The impact will be neglectable as the bridge will be a minor one.

Mitigation Measures

- Silt fencing may be provided to avoid runoff into the river.

2) Operation Phase

-During operation phase no impact is envisaged on bottom sediment

(9) Offensive Odour

No activities causing offensive odour is envisaged; however, cleanliness must be maintained at construction site during construction and at ICD & stations to avoid any foul odour.

Environmental impact matrices of Mahendragarh and Rewari district are given in Table 5.25.

Table 5-25 Matrix of Environmental Impacts –Rewari and Mahendragarh Districts

No.	ITEMS	Overall Evaluation on the Project	Pre-construction Stage			Construction Stage										Post-construction Stage								
										Construction Works for railway line and related structures														
			Surveying of Planned Areas and Sites	Selection of the Project Location and Sites	Land Acquisition and Resettlement	Extraction of Building Materials (stones, aggregates, sand, soil, etc.) at Quarries and Borrow Areas	Earth Moving: Cutting and Filling of the Construction Works	Preparation of Construction Plants, and Warehouses, Work Camps, etc.	Operation of Construction Plants, Machines and Vehicles for Construction Works	(A) Construction Works for Railway Lines and Installation of Related Facilities (signals, rails, etc.)	(B) Construction Works for ICDs and Freight Logistic Parks	(C) Construction Works for Stations (Terminal, Junction and Crossing)	(D) Construction Works for ROBs and RUBs	(E) Construction Works for Bridges	(F) Construction Works for Tunnels	Localized Employment Opportunities of the Construction Works	Localized Business Opportunities Related to the Construction Works	Traffic Conditions of Freight Trains	Logistic Condition of Goods, Raw Materials, Agricultural and Industrial Products	Traffic Condition of Roads	Operation and Maintenance of Railway lines and Related Structures	Employment Opportunities (whole country/local level)	Freight-oriented Business Opportunities	Passenger Oriented Business Opportunities	Promoting Development of Surrounding Area	Increase in Settlers and Visitors to the Project Area
Environmental Pollution																										
1	Air Pollution	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	E	C-	D-	D-	C-	E	E	E	E	E
2	Water Pollution	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	E	C-	D-	D-	C-	E	E	E	E	C-
3	Soil Contamination	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	E	C-	D-	D-	C-	E	E	E	E	C-
4	Solid waste and industrial discharge	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	E	C-	D-	D-	C-	E	E	E	E	C-
5	Noise and vibration	C-	D-	D-	D-	C-	C-	C-	C-	C-	C-	C-	D-	C-	E	E	E	C-	D-	D-	C-	E	E	E	E	C-
6	Land subsidence	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
7	Bottom sediment	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
8	Offensive odour	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

Note: A: Significant impact, B: Relatively Significant impact, C: Insignificant impact, D: Neglect able impact, E: No impact , - : Negative impact, + : Positive impact

Description of Environmental Impact Matrix

Sl. No	Pollution item	Scaling	Reasons (during pre construction phase)	Reasons (during construction phase)	Reasons (after-construction phase)
1	Air Pollution	C-	D- No significant impact is likely to take place.	C-:Dust and NOx emission from construction machines and vehicles during construction	D-: Air pollutant emission from freight trains is expected to be negligible from electric engine and even in case of diesel traction is applied.
2	Water Pollution	C-/D-	D- No significant impact is likely to take place.	C-: Wastewater discharge from earthworks, engineering, temporary houses of workers during construction and operation of railway facilities. (2) Ground water can be marginally polluted from the leachate of disposed solid waste.(3)Local water bodies(Canal, Ponds etc.) can be affected by sediments during construction phase.	D-: Wastewater discharge from freight railway facilities is expected to be negligible/ if proper pollution control management earthworks, engineering, temporary houses of workers during construction and operation of railway facilities.
3	Soil Contamination	D-	D- No significant impact is likely to take place.	D-: Contamination of hazardous materials such as heavy metals and toxic chemicals to soil can be avoided through proper pollution control management during construction phase.	D-: Contamination of hazardous materials such as heavy metals and toxic chemicals to soil are not expected.
4	Solid waste	C-	D- No significant impact is likely to take place.	C-: Generation of construction and household waste during construction phase. (Secure proper segregation, transportation, treatment and disposal.)	C-: Generation of solid waste from freight railway related facilities.
5	Noise	C-	D- No significant impact is likely to take place.	C-: Noise generation from earthmoving and construction works during construction	(1)C-: Houses are located at comparatively longer distance.
6	Vibration	C-	D- No significant impact is likely to take place.	C-: Vibration generation from earthmoving and construction works during construction	(1)C-: Houses are located at comparatively longer distance.
7	Bottom Sediment	D-	D- No significant impact is likely to take place.	D-: No Perennial river located during survey, Marginal impact of sedimentation will be on local water bodies spread over distributed area	D-: There is expected to be no activities which may cause bottom sediment pollution.
8	Ground Subsidence	D-	D- No significant impact is likely to take place.	D-: Railway lines are planned in the area with firm ground condition. No earth works and civil engineering are planned to affect groundwater table.	D-: There is expected to be no activities which may cause ground subsidence.
9	Offensive Odor	D-	D- No significant impact is likely to take place.	D-: Some possibility of Generation of offensive odor during construction phase.	D-: Generation of offensive odor is expected to be negligible.

5.5.4 Noise and Vibration Survey

(1) Background and Purpose

One of the major environmental concerns arising out of the railway operation is the noise and vibration. While vibration may lead to damage of cultural assets and other establishments near railway track, noise has impacts on the human health. The country has definite statutory specifications, rules and a regulation regarding noise level at different regions, as has been discussed in the previous section.

The noise and vibration survey has therefore been incorporated in the study as a very important component to study the feasibility of a dedicated freight corridor (DFC) construction.

(2) Approach and Methodology of Railway Noise and Vibration Measurement

1) Selection of Sensitive Receptors:

As per the agreed methodologies, for noise and vibration survey, a primary field visit was conducted to identify the locations of sensitive receptors. The identification was done following the standard norms and guidance of JICA Study Team. 15 points for ambient noise and vibration survey and 5 points of detailed railway noise and vibration survey were chosen, along with a few other optional points for measurement. A few points selected for ambient noise and vibration measurement were also chosen for measuring the noise and vibration level at the time of when a train either passenger or freight is passing by the existing railway track. Hence, the noise and vibration survey was conducted in three categories: 1) railway noise and vibration survey along the railways, 2) ambient noise and vibration survey at sensitive receptors, and 3) railway noise and vibration survey at sensitive receptors.

Along with the noise and vibration measurement and collection of secondary information on the sampling locations, a questionnaire survey was also undertaken at all the points of noise and vibration survey at sensitive receptors to assess the people's perception regarding existing problem of railway noise and vibration at their neighbourhood. For each measurement point, 10 persons were interviewed on this aspect.

2) Railway Noise and Vibration Measurement along Railways

The integrated noise and vibration level meters were put in a horizontal series at 12.5 m, 25 m, 50 m and 100m distances from the central line of the existing railway track. The readings were taken simultaneously at all the four points, when at least eight trains including both passenger and freight passed by in the same direction.

Five-railway noise and vibration measurement were sites chosen along the whole railway track covered in Haryana and Rajasthan. Two were near bridges and the rest at the areas of plain running rail track on embankment. The following procedure for the railway noise and vibration measurement along railways was used.

- The baseline data in respect of railway noise and vibration features and patterns viz. track characteristics, attenuation patterns with distance, train speed etc. have been collected. The train categorizations are followed in Table 5-26.
- The noise and vibration level for the time interval of each train passing, were noted.
- Sound exposure level or L_{AE} and L_{Aeq} (equivalent continuous A-weighted sound pressure level) of passing trains by train categories were noted in accordance JIS Z 8731 (Acoustics-Description and Measurement of Environmental Noise).
- The vibration level of peak level of passing trains was also been measured.

- The vibration measurements were also done simultaneously using JIS Z 8735 (Methods of measurement of vibration level).

The scheme of measurement is given in Figure5-1.

Table 5-26 Categorization of Trains

Category		Specification			
		Train	Traction	Load	Route
1.	FD 1A	Freight Train	Diesel Traction	Container	Plain route
2.	FD 1B	Freight Train	Diesel Traction	Container	Bridge
3.	FD 2A	Freight Train	Diesel Traction	Container	Plain Route
4.	FD 2B	Freight Train	Diesel Traction	Container	Bridge
5.	FD 3A	Freight Train	Diesel Traction	Open Wagon for Bulk transportation	Plain Route
6.	FD 3B	Freight Train	Diesel Traction	Open Wagon for Bulk transportation	Bridge
7.	FE 1A	Freight Train	Electrified Traction	Container	Plain Route
8.	FE 1B	Freight Train	Electrified Traction	Container	Bridge
9.	FE 2A	Freight Train	Electrified Traction	Covered Wagon	Plain Route
10.	FE 2B	Freight Train	Electrified Traction	Covered Wagon	Bridge
11.	FE 3A	Freight Train	Electrified Traction	Open Wagon for Bulk transportation	Plain Route
12.	FE 3B	Freight Train	Electrified Traction	Open Wagon for Bulk transportation	Bridge
13.	PD A	Passenger Train	Diesel Traction	-	Plain Route
14.	PD B	Passenger Train	Diesel Traction	-	Bridge
15.	PE A	Passenger Train	Electrified Traction	-	Plain Route
16.	PE B	Passenger Train	Electrified Traction	-	Bridge

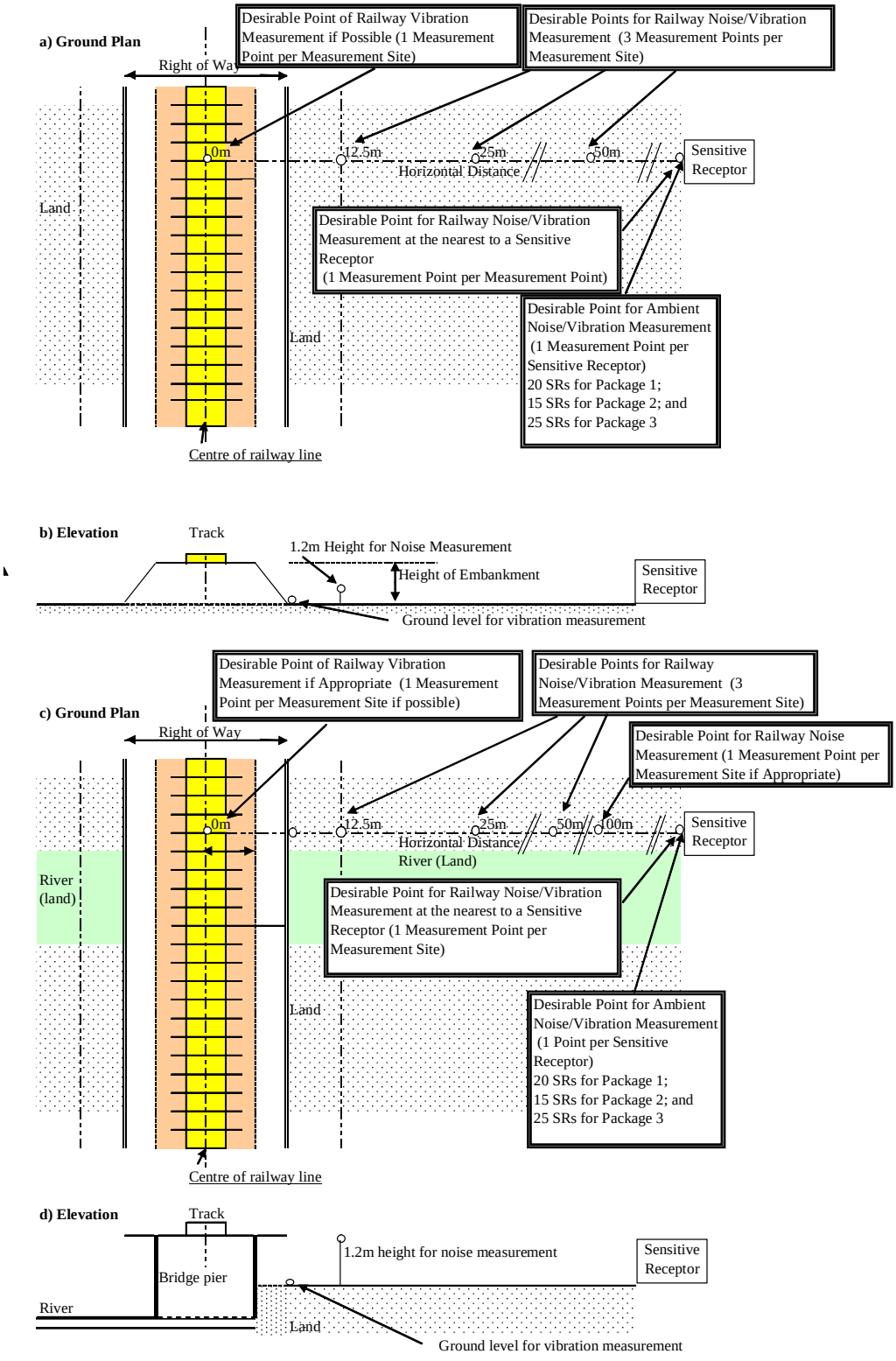


Figure 5-1 Schematic Plan & Elevation of Railway, Ambient Noise and Vibration

3) Noise and Vibration Measurement at Sensitive Receptors

a) Ambient Noise and Vibration Measurement at Sensitive Receptors

Sensitive receptors are identified as educational institutes, hospitals and health centres, courts and religious establishments. Ambient noise and vibration were surveyed at or in near proximity of different identified sensitive receptors located the track or along the proposed diversions in DFC. The readings were taken continuously for 4 hours.

b) Railway Noise and Vibration Survey at Sensitive Receptors

The noise and vibration survey conducted at the sensitive receptor points at the time of any train passing by the track is considered as railway noise and vibration survey at sensitive receptors. In case of railway noise and vibration measurement at SRs, almost the same procedure of ambient noise and vibration measurement at SRs is followed. The measurements were conducted for all the trains passing including crossing trains passing both directions for a time interval of 4 hours. Among the total 15 ambient noise and vibration measurement points along whole of the DFC alignment, railway noise and vibration measurement study was done in 10 points.

Stepwise general methodology of noise and vibration measurement near sensitive receptors is as follows:

- The measurement is done at a point near to the sensitive receptors for the stipulated time span of 4 hr.
- The measurement was done in accordance JIS Z 8731 (Acoustics-Description and Measurement of Environmental Noise).
- The vibration measurements were also been done simultaneously using JIS Z 8735 (Methods of measurement of vibration level).
- The detailed site conditions, such as land use, urban/rural condition, structures and facilities prevailing around the sampling sites, etc.
- Four photographs of each of the point have been taken to show the area profile of the point.
- Both day time and night time measurements were taken in different locations.

4) Questionnaire Survey Methodology and Result

Parallel to the noise and vibration measurement, a questionnaire survey was also conducted among the local people residing around the Sensitive receptor points. They were asked to answer a few queries related to their perceptions over the disturbances and annoyance caused by railway noise and vibration due to existing railway track.

10 respondents were chosen randomly from each of the sampling sites and interviewed only after making them understand the purpose of the survey.

5.5.5 Results of Railway Noise and Vibration Measurement

The results of noise and vibration survey for Rewari district are reported and discussed below followed by Mahendragarh district

(1) Rewari District

1) Railway Noise and Vibration Survey along Railways

Detailed railway noise and vibration survey was conducted at two sites in Rewari District. The point selected for DR study under Rewari District was on the plain route at a railway crossing near Khalilpur railway station and halfway between Bharawas and Bawal railway station. The detailed information on the site including the photograph is given in Table 5-27.

Table 5-27 Description of the Measurement Site

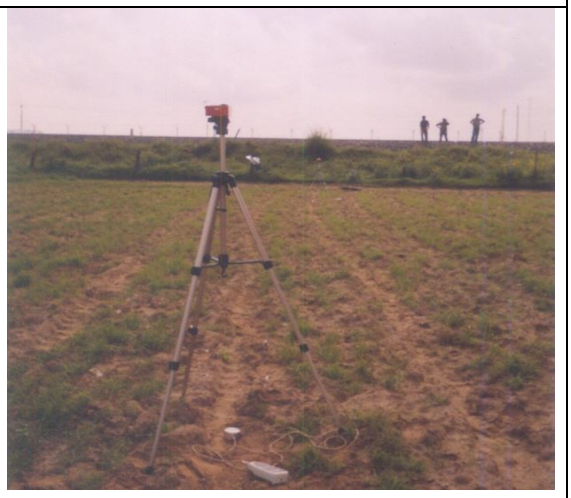
SR No.	Description of the Site	Photograph
DR-1	Location: Railway crossing near Khalilpur RS Position: N 28°12.162' and E 76°36.596' Position on DFC: The DFC will run along the existing alignment on which the measurement is done. Land use: Urban (Residential, Commercial, Industrial). Other sources of noise: Road traffic noises The Number of Points: 3 points. Distance of points: at 12.5, 25 & 50 m from the railway track.	
DR -2	Location: halfway between Bharawas and Bawal RS Position: N 28°6' 16.57", E 76°35' 27.60" Position on DFC: The DFC will run along the existing alignment on which the measurement is done. Landuse: Others (Specify: Semi-urban) Other sources of noise: Factory The Number of Points: 3 points. Distance of points: at 12.5, 25 & 50 m. from the railway track.	

Table 5-28 shows results of the detailed railway noise and vibration survey at DR 1 and DR 2.

Table 5- 28 Survey Results of Railway Noise and Vibration in Rewari District

DR site No.	Type of Track	Location of DR site	Category of Trains	Number of traincars	Passage time (mm:ss)	Running speed (km/hr)	Railway Noise Level (dB)						Railway Vibration (dB)		
							L_{Aeq}			LAE					
							12.5m	25m	50m	12.5m	25m	50m	12.5m	25m	50m
DR-1	Plain Route	Railway crossing near Khalipur RS	FD1A	46	1:50	34.62	75	70	65	96	92	85	68	57	49
			PDA	24	0:54	36.8	73	68	62	93	90	84	69	58.	49
			PDA	23	1:02	30.72	74	69	62	94	90	83	59	55	48
			PDA	46	1:51	34.31	75	70	63	85	81	76	62	55	50
			PDA	21	0:43	40.43	76	70	66	95	91	86	70	63	53
			PDA	26	0:49	43.83	76	72	66	95	90	86	66	54	49
DR-2	Plain Route	Halfway between Bharawas and Bawal RS	PDA	24	0:25	79.5	89	83	79	99	99	96	74	66	62
			FD1A	43	0:31	27.7	88	85	81	105	101	99	72	69	61
			PDA	23	0:24	79.34	89	87	79	106	102	97	70	63	57
			PDA	21	0:15	115.92	91	85	78	104	100	95	73	65	59
			PDA	10	0:12	68.9	90	85	77	104	100	95	72	63	56

2) Noise and Vibration Status

The detailed railway noise and vibration survey shows that during train operation along the railway track, the noise and vibration levels always exceed the desirable regime and/or statutory regulations. However, a trend of attenuation of the noise and vibration levels with distance from the track was clearly observable. Also, the noise and vibration conditions and its variations were found dependant on the type and speed of the train, during passage of which the study was conducted. A few significant findings regarding those trends are as follows:

- The attenuation of noise with distance from the railway track did not show any particular difference in its pattern for passenger and freight trains. Hence, no significant impact of train type and speed on the noise level was recorded, especially up to a distance of 25 meters. However, at a distance of 50 meters the noise attenuation seemed better for the freight trains compared to the passenger trains having higher speed as shown in Figure 5-2, Figure 5-3, Figure 5-4, and Figure 5-5.

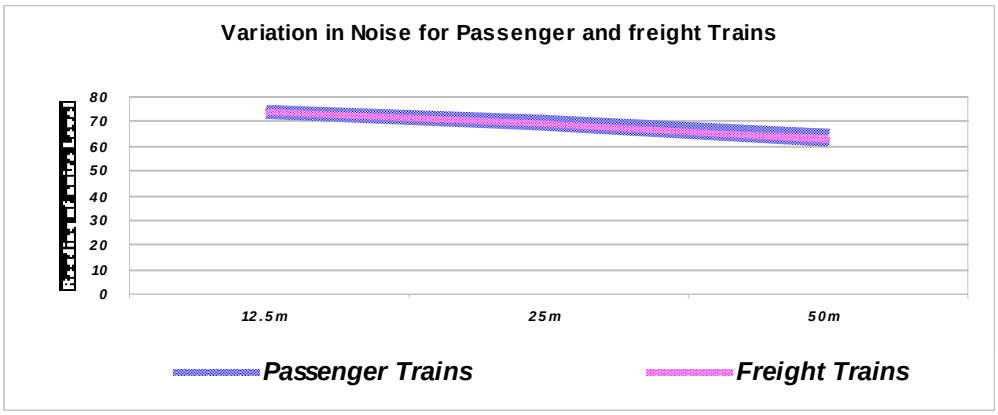


Figure 5-2 Attenuation Pattern of Railway Noise for DR 1

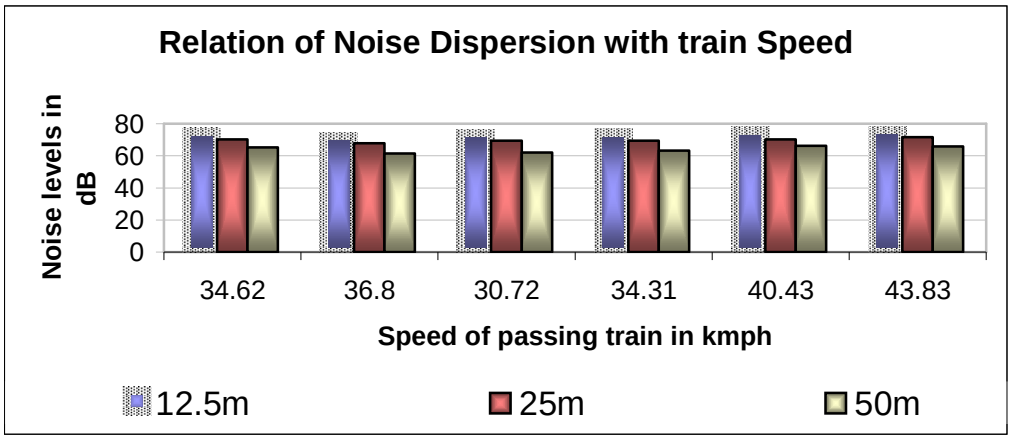


Figure 5-3 Relation of Noise Dispersion with Train Speed for DR 1

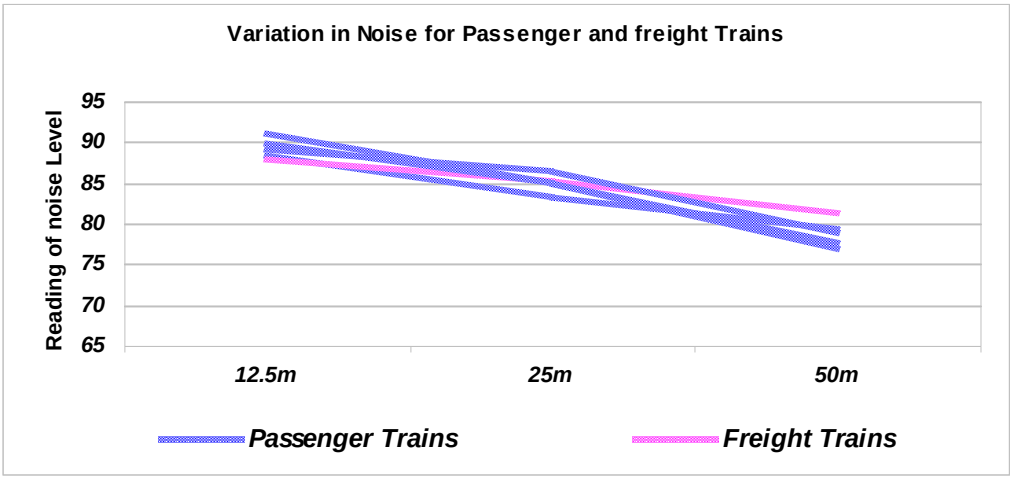


Figure 5-4 Attenuation Pattern of Railway Noise For DR 2

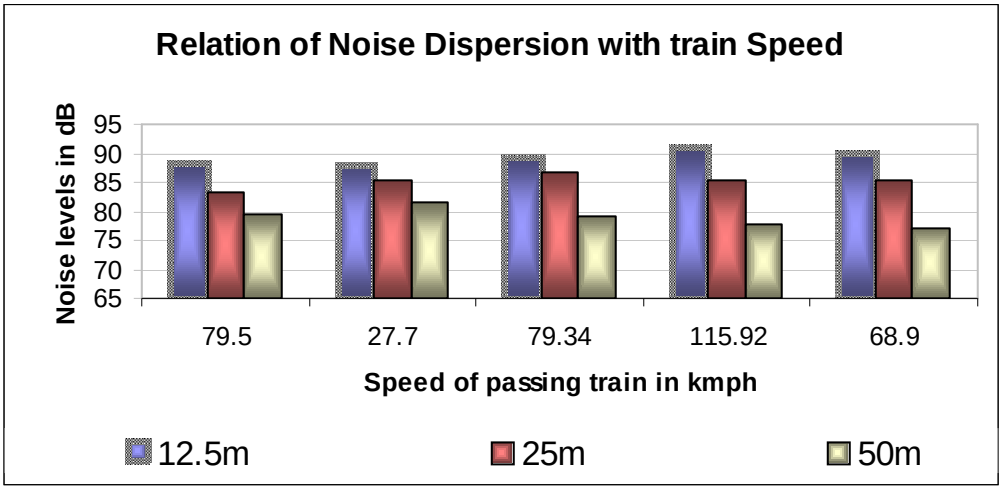


Figure 5-5 Relation of Noise Dispersion with Train Speed for DR 2

The attenuation of vibration with distance from the railway track showed a clear trend and effects of different train types were also significant. It has been found that significant rate of

vibration attenuation occurs at places closer to the track. However, the vibration level seemed to be higher for passenger trains having higher speed than freight trains as shown in Figure 5-6 and Figure 5-7.

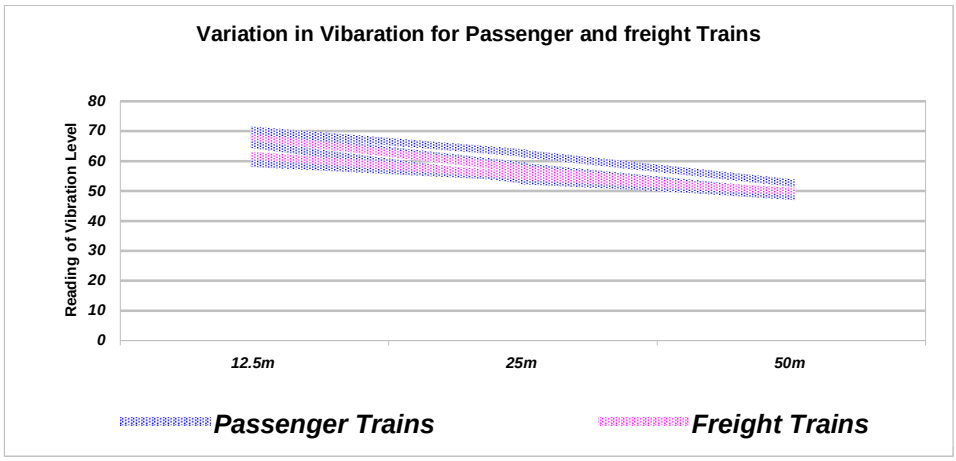


Figure 5- 6 Attenuation Pattern of Railway Vibration for DR 1

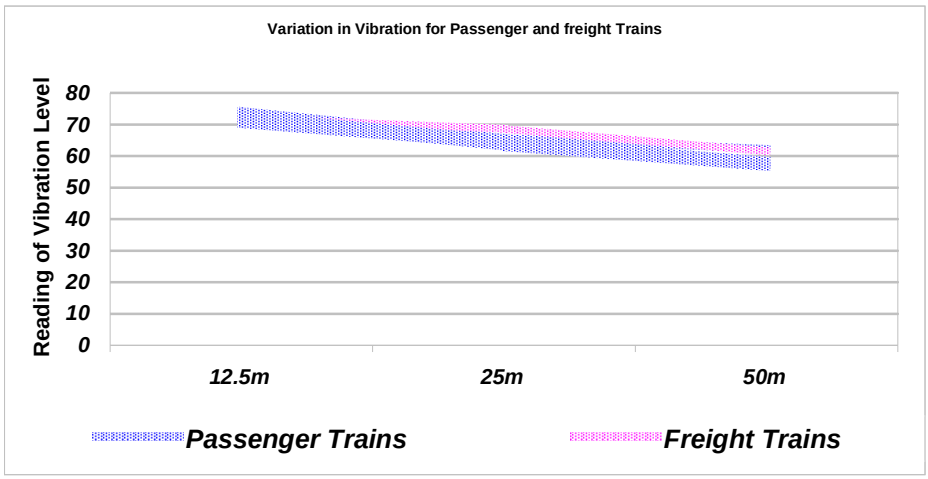


Figure 5-7 Attenuation Pattern of Railway Vibration for DR 2

The nearest recording point did not show any significant difference for passenger or freight trains having completely different ranges of speeds. However, lower level of vibration attenuation with increasing distance from the railway track was recorded in case of trains having higher speed as shown in Figure 5-8 and Figure 5-9.

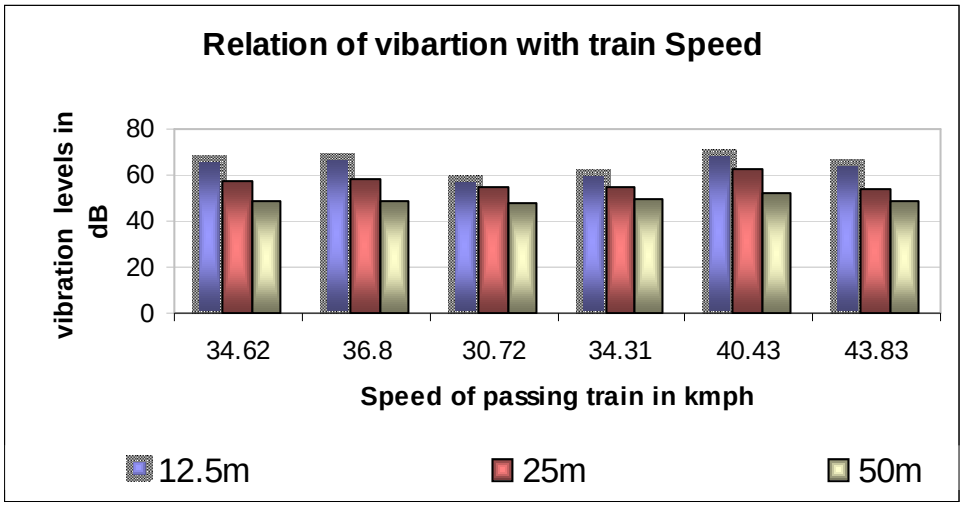


Figure 5-8 Relation of Vibration Dispersion with Train Speed for DR1

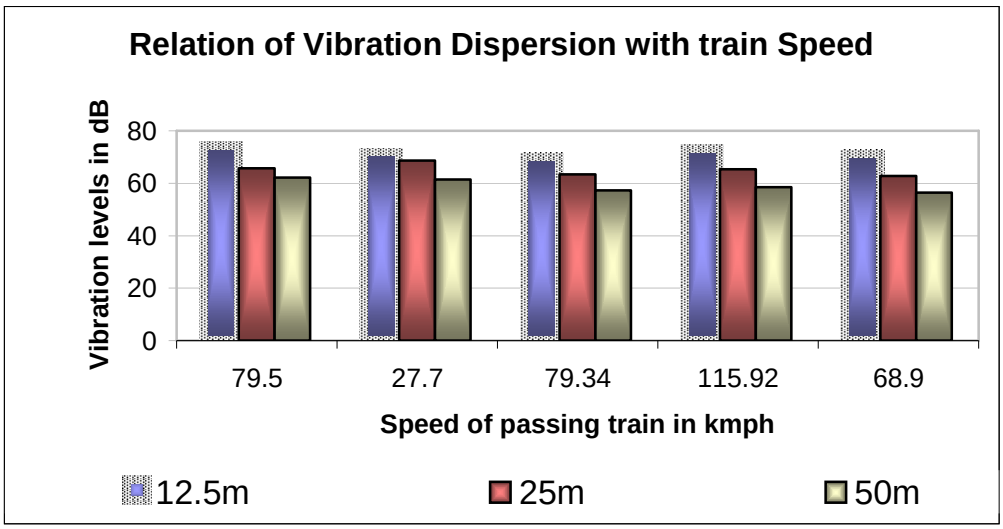


Figure 5-9 Relation of Vibration Dispersion with Train Speed for DR2

The overall findings of the study at Rewari District suggests that near vicinity although both the passenger and freight trains create similar level of noise and vibration problems, the impact proceeds to longer distances for passenger trains. The noise and vibration level attenuates significantly better with the distance, compared to the passenger trains.

3) Existing Situation of Noise and Vibration at Sensitive Receptors alongside the Railway Line

During primary site visits two sampling points in the Rewari District, one point each for ambient and railway noise and vibration measurements are situated in the Diversion, near Harinagar and SR site, Rewari RS. The results of the survey are presented in following sections.

a) Ambient Noise and Vibration Study at SRs

Two concerned points for ambient noise and vibration measurement were chosen as the Diversion, near Harinagar and SR site (Temple), Rewari RS. As the proposed DFC will be established along the detour alignment and both the points are situated on the existing railway track, the points are considered to be of 'E' category, which are situated on the existing track

but not on the DFC. The details of sampling sites along with the photographs are given in Table 5-29.

Table 5-29 Detailed Information and photographs of the Sampling Sites

SR No.	Description of the site	Photographs
SR 7	Location: Diversion near Harinagar Rewari Position: N 28°12.162' and E 76°36.596' Position on DFC: The point is situated on existing track, but the DFC will go through detour. Landuse: Rural Other sources of noise: Factory (HPCL filling station about 1 km from the Site)	
SROP5	Location: SR site, Rewari RS . Position: N 28°12.162' , E 73°36.59' Distance from the track: 50 mts Position on DFC: The point is situated on existing track, but the DFC will go through detour. Landuse: Others (Specify: Semi-Urban). Other sources of noise: Road Traffic	

b) Railway Noise and Vibration Study at SRs

Among the 2 ASR locations in 1 location, SR site, Rewari RS, the RSR study was conducted. At each of the study points questionnaire survey have also been conducted.

(i) Noise

Noise is an important factor for any railway track to be established. The present noise level of the district has been found to be marginal in respect to the statutory regulations set by the central pollution control board under the provision of Noise pollution (Regulation and Control) Rules, 2000, Notified by the Government of India as described in Table 5-30.

Table 5-30 Ambient Noise Quality Standards under Noise Pollution (Regulation and Control) Rules, 2000

Area code	Category of Area / Zone	Limits in dB L_{Aeq}*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note: * dB L_{Aeq} denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

The ambient noise levels at all the recording stations in the district are observed to be marginally exceeding the limit of residential and commercial zones. However, the noise level at SR site, Rewari RS. The SR site, Rewari nearby the station has moderate traffic.

The railway noise level, i.e. at the time of passing of any train did not vary with that of the ambient noise. It is unlikely to happen in a point located only 50 m away of the existing rail

track. But, it seems that boundary walls and railway constructions around the sampling point have some damning effects on the noise level and its propagation. It is, therefore, imperative that civil structures, if constructed properly may mitigate noise pollution at the sensitive receptors.

(ii) Vibration

The ambient and railway vibrations were found within desirable level for both the sampling stations at Rewari. Even, the vibration increased only 10% during railway operation (Table 5-31). This also is indicative of the damning impact of civil structures around.

Table 5-31 Result of Ambient Noise and Vibration Measurement at SR Sites in Rewari district

Location of SR site	Type of Railway Line (E, P, D)(3)	Duration of measurement (hr)	Distance (m) (4)	Ambient Noise Level (dB)	Ambient Vibration Level (dB)		Remarks
				L_{Aeq}	L_{Max}	L_{10}	
Diversion , near Harinagar Rewari	D	4 hrs	-	44	46	38	No traffic
SR site , Rewari RS	E	4 hrs	50 m	69	56	36	Traffic due to station nearby

Table 5-32 Result of Railway Noise and Vibration Measurement at SR sites in Rewari district

Location of SR site	Type of Railway Line (E, P, D)(3)	Duration of measurement (hr)	Distance (m) (4)	Railway Noise Level (dB)	Railway Vibration Level (dB)	Remarks
				L_{Aeq}	L_{Max}	
SR site , Rewari RS	E	2 hrs	50 m	75	56	traffic due to station nearby

(2) Mahendragarh District

The results of noise and vibration survey for Mahendragarh District are presented and discussed below.

1) Railway Noise and Vibration Survey along Railways:

There was no detailed railway noise and vibration survey conducted in in Mahendragarh district.

2) Existing Situation of Noise and Vibration at Sensitive Receptors alongside the Railway Line

The results of ambient noise and vibration measurements done at two sites in Mahendragarh districts are presented in following sections

a) Ambient Railway Noise and Vibration Study at SRs

SVN public school (Cambridge Convent School) between Ateli RS and Narnaul RS and Govt. College, Narnaul near Narnaul RS, was chosen as the points for ambient noise and vibration measurement. As the proposed DFC will be established along the detour alignment and both the points are situated on the existing railway track, the points are considered to be of 'E' category, which are situated on the existing track but not on the DFC. The details of sampling sites along with the photographs are given in Table 5-33.

Table 5-33 Detailed Information and Photographs of the Sampling Sites

SR No.	Description of the site	Photographs
SR 24	Location: SVN public school (Cambridge Convent School) between Ateli RS and Narnaul RS Position: N 28°25.182' and E 76°35.598' Distance from the track: 1500 m. Position on DFC: The point is situated on existing track, but the DFC will go through detour. Land use: Rural. Other sources of noise: Road Traffic.	
SR 2	Location: Govt. College, Narnaul near Narnaul RS, Haryana. Position: N 28°25.162', E 71°35.598' Distance from the track: 150 m Position on DFC: The point is situated on existing track, but the DFC will go through detour. Land use: Rural. Other sources of noise: Road Traffic.	

(i) Noise

The present noise level of the district has been found to be marginal in respect to the statutory regulations set by the central pollution control board under the provision of Noise pollution (Regulation and Control) Rules, 2000, Notified by the Government of India.

The ambient and Railway noise levels at all the recording stations in the district have been found marginally exceeding the limit of residential and commercial zones. However, the noise level at Govt College, near Narnaul Railway Station was comparatively higher than that of the SVN public school, between Ateli RS and Narnaul Railway Station.

(ii) Vibration

The ambient and railway vibrations were found within desirable level for both the sampling stations at Mahendragarh. Even, the vibration increased only 10% during railway operation (Table 5-34). This also is indicative of the damning impact of civil structures around.

Table 5-34 Result of Ambient Noise and Vibration Measurement at SR Sites

Serial No. (1)	Type of SR	Location of SR site	Type of Railway Line (E, P, D)(3)	Duration of measurement (hr)	Distance (m) (4)	Ambient Noise Level (dB)	Ambient Vibration Level (dB)		Remarks
						L_{Aeq}	L_{Max}	L_{10}	
P2-SR1	School	SVN public school , between Ateli RS and Narnaul RS	P	4 hrs	1500 m	70	61	39	Heavy traffic on road of highly loaded trucks & tractor, train not visible from site as site is at 1.5 km distance from nearest track
P2-SR2	Govt. College	Govt. College , near Narnaul RS	P	4 hrs	130 m	74.5	61	32	Heavy traffic on road of highly loaded trucks & tractor moving at very high speed

Table 5-35 Result of Railway Noise and Vibration Measurement at SR sites

Serial No. (1)	Type of SR	Location of SR site	Type of Railway Line (E, P, D)(3)	Duration of measurement (hr)	Distance (m) (4)	Railway Noise Level (dB)	Railway Vibration Level (dB)	Remarks
						L_{Aeq}	L_{Max}	
P2-SR1	school	SVN public school , between Ateli RS and Narnaul RS	P	2 hrs	1500 m	72	60	Heavy traffic on road of highly loaded trucks & tractor ,train not visible from site as site is at 1.5 km distance from nearest track
P2-SR2	Govt. College	Govt. College , near Narnaul RS	P	2 hrs	130 m	70	42	Heavy traffic on road of highly loaded trucks & tractor moving at very high speed

5.5.6 Result of Questionnaire Survey

(1) Rewari

As already discussed, the questionnaire survey was conducted among the local people at all the sensitive receptors, where noise and vibration measurement were made. Accordingly, in the Rewari District, 20 persons were interviewed for their perceptions on the existing railway and vibration conditions. The responses were then tabulated and analyzed.

Among the respondents most of the persons was found to be Workers (30%), followed by Farmers (15%), Retired (5%), Student (20%), House wives (10%) Businessman (15%) and Temple Priest (5%).

Mixed type of response regarding annoyance level of people over railway noise and vibration were available. While 5% of them held noise to be the worst problem, nearly similar proportion of people (50%) did not feel any problem from the railway noise and vibration. 5% people held the vibration responsible for their annoyance, while both the problem of noise and vibration was perceived as problems of railway operation by only 50% people (Figure 5-10). Further details of the questionnaire survey are given in the annex.

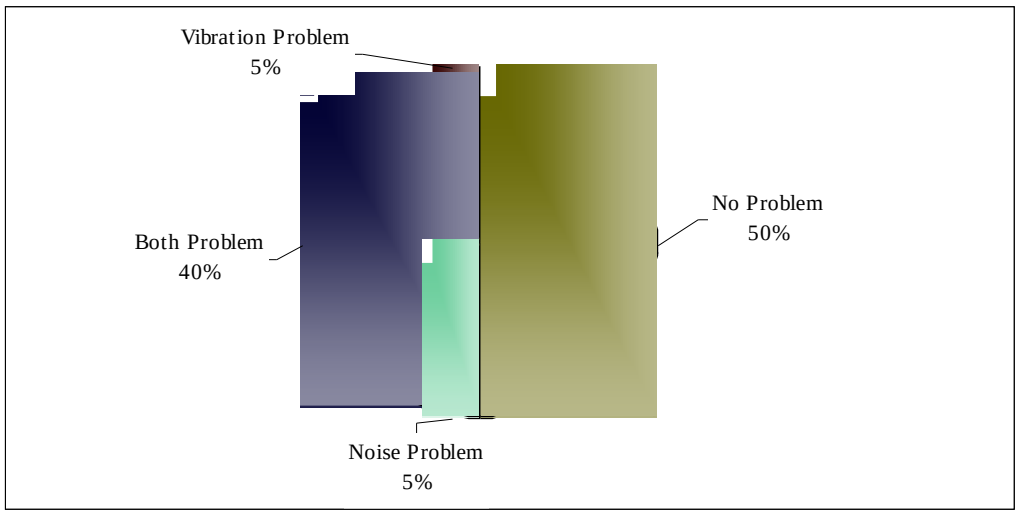


Figure 5-10 Perception on Issues of Annoyance from Railway

The pattern of responses is clearly indicative of the fact that the most crucial issue is noise. At the same time, 50% of the respondents have no problem. These findings suggest noise of railway is perceived as a predominant problem in the Rewari railway station area under Rewari District.

(2) Mahendragarh

In Mahendragarh District a total of 20 people were interviewed for their perceptions on the existing railway and vibration conditions. The responses were then tabulated and analyzed.

Among the respondents most of the people was found to be Students (25%), followed by workers (20%), Businessman (10%), Retired (5%), Teacher (10%), Farmer (10%) and housewives (20%).

The response regarding annoyance level of people over railway noise and vibration have been mixed. While 24% of them held noise to be the worst problem, nearly similar proportion of people (10%) did not feel any problem from the railway noise and vibration. 5% people held the vibration responsible for their annoyance, while both the problem of noise and vibration was perceived as problems of railway operation by only 61% people (Figure 5-11). Further details of the questionnaire survey are given in the annex.

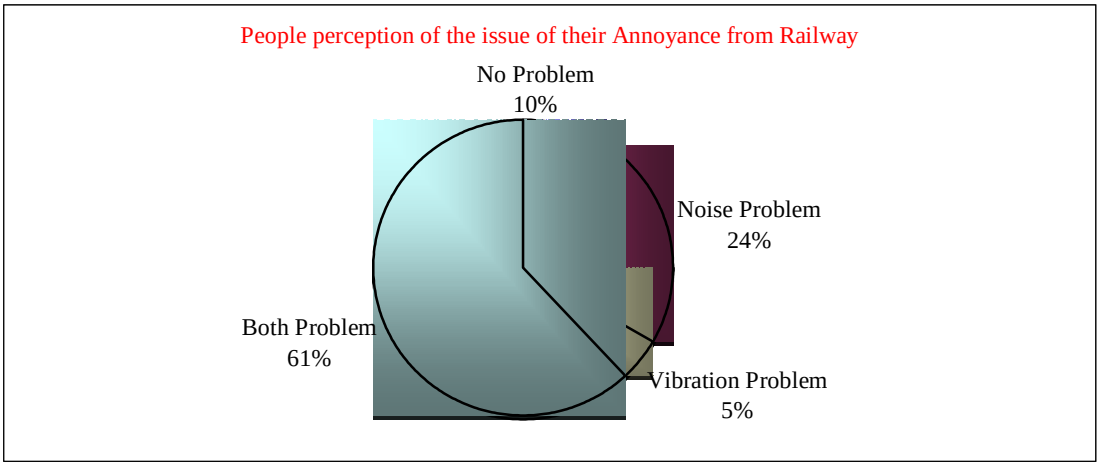


Figure 5-11 Perception on Issues of Annoyance from Railway

The pattern of responses is clearly indicative of the fact that the most concerned issue is noise. At the same time, 10% of the respondents had no problem.

5.5.7 Prediction and Evaluation of Impacts on Noise and Vibration alongside Railway Lines

(1) Procedure of Prediction and Evaluation

Prediction and evaluation of railway noise and vibration due to the passing freight trains have been carried out for each SR site according to the procedure of prediction and evaluation as shown in Figure 5-12.

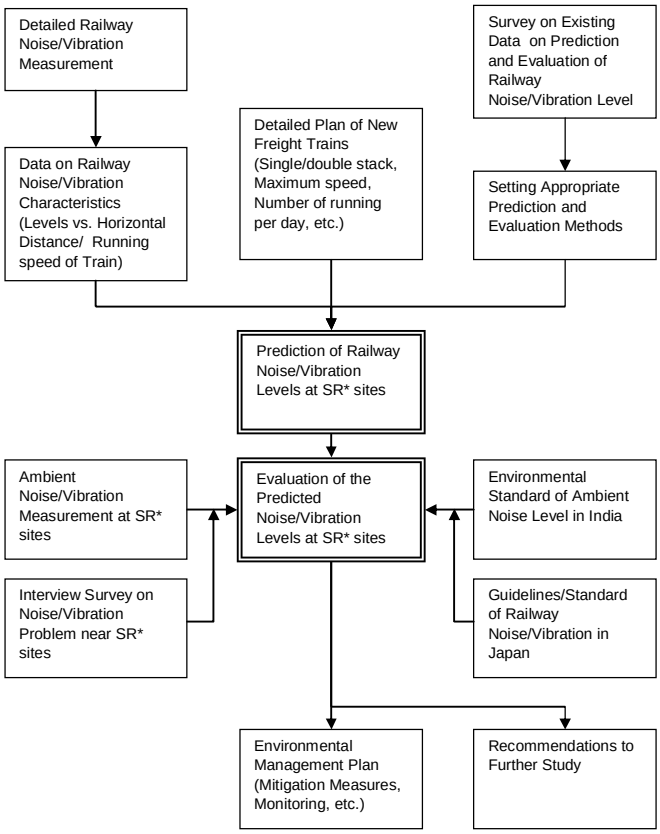


Figure 5-12 Procedure for Prediction and Evaluation of Noise and Vibration Levels

(2) Examination of Prediction Method

1) Railway Noise

As mentioned above, main causes for railway noise generated by conventional trains (local trains, express trains and limited express trains), in Japan include (1) traction movements, (2) structures and (3) machines equipped to the train. Among them, the traction movement contributes to the generation of noise greatly.

In Japan, several types of prediction equations were proposed for various types of railway track structures, such as the elevation, embankment and cutting. Some equations were examined including the equation proposed by Railway Technical Research Institute of Japan in 1996. As a result, the equation with applicable parameters was selected by considering differences in tracks, trains, and structures between India and Japan. Therefore, prediction was

carried out applying the actual data of railway noise level (L_{AE}), running speed (V) of trains, and the distance from centre of the nearest railway track (D).

Based on the obtained the data of railway noise levels along the railways at 15 sites over 5 states, the empirical equation was extracted by using a simple regression and correlation analysis of variables of (Log_{10} (D), Log_{10} (V) and Log_{10} (D).

If V is assumed to be constant, D is only one variable, and the empirical equation is shown below.

$$\mathbf{L_{AE1} = A_1 + B_1\ Log10\ (D)} \qquad \text{---------- (1-1)}$$

$$\mathbf{L_{Aeq1} = L_{AE1} + 10\ Log10\ (N/T)} \qquad \text{---------- (1-2)}$$

2) Prediction Method of Railway Vibration

In Japan, the methodology of railway vibration prediction is not fully established, compared to that of railway noise. Based on the data on the running speed of trains, track types, structures and the distance from the centre of the nearest railway track, a few empirical equations were proposed by Tokyo Metropolitan Government and Osaka Prefecture Government.

Initially the equations developed by these two organizations were examined. However, it is also undesirable to apply directly the equations developed in Japan to predict railway vibration levels of freight trains in India. One of the reasons would be that the propagation pattern of vibration changes depending upon conditions of railway tracks, foundations, structures, the surface of ground (soil types, concrete or asphalt), etc., and these conditions are considered different from these in Japan.

Therefore, prediction was carried out applying in the similar manner by applying the actual data of the railway vibration level (L_{Max}), the running speed (V) of train, and the distance from centre of the nearest railway track (D).

Based on the actual data obtained through railway vibration measurement at 15 sites along the existing the railway, the equation was prepared for the prediction of vibration levels:

If V is assumed to be constant, D is only one variable, and the empirical equation is shown below.

$$\mathbf{L_{Max\,3} = A_3 + B_3\ Log10\ (D)} \qquad \text{---------- (3)}$$

(3) Prediction and Evaluation of Railway Noise and Vibration due to Dedicated Freight Trains

1) Condition of Prediction

Following conditions are assumed:

- Type of traction: electrified traction (electric locomotive)
- Running operation: 140 trains/direction/day with the same time interval (approximately one train for every five minutes)
- Maximum running velocity: 100 km/h
- Targeted railway structures:
- Majority of the existing railway line structures are the embankment structures with approximately 2 to 5 m high from the ground level at the site. Therefore, railway tracks are expected to be located at the same level as ground level.

- Railway noise and vibration generation level due to planned dedicated freight train: remains the same as the existing freight train, although DFC plan would have various factors contributing to reduction in railway noise and vibration.

(4) Predicted Noise and Vibration Levels in Rewari District

The predicted noise and vibration levels at one measurement site in Rewari District are shown in the Tables 5-36 and 5-37.

Table 5-36 Predicted Noise Levels in Rewari District at SR site.

S.No.	Type of SR	Location of SR site	Pridicted Noise Level(dB)	Standard Noise Level(2)	Present Ambient Noise Level(dB)	Present Railway Noise Level (dB)
			L_{Aeq}	L_{Aeq}	L_{Aeq}	L_{Aeq}
1.	Temple	Temple near , Rewari RS	70	50	69	75

Table 5-37 Predicted Vibration Levels in Rewari District at SR site.

S.No.	Type of SR	Location of SR site	Predicted Vibration Level(dB)	Standard Vibration Level(2)	Present Ambient Vibration Level(dB)	Present Railway Vibration Level (dB)
			L_{Aeq}	L_{Aeq}	L_{Aeq}	L_{Aeq}
1.	Temple	Temple near , Rewari RS	56	56	36	56

(5) Predicted Noise and Vibration Levels in Mahendragarh District

The predicted noise and vibration levels at 2 measurement sites in Mahendragarh District are shown in Table 5-38 and Table 5-39.

Table 5-38 Predicted Noise Levels in Mahendragarh District

S.No.	Type of SR	Location of SR site	Predicted Noise Level(dB)	Standard Noise Level(dB)	Present Ambient Noise Level(dB)	Present Railway Noise Level (dB)
			L_{Aeq}	L_{Aeq}	L_{Aeq}	L_{Aeq}
1.	School	SVN Public School,between Ateli RS and Narnaul RS	65	50	70	72
2.	Govt College	Govt College , near Narnaul RS	66	50	75	70

Table 5-39 Predicted Vibration Levels in Mahendragarh District

S. No.	Type of SR	Location of SR site	Predicted Vibration Level(dB)	Standard Vibration Level(dB)	Present Ambient Vibration Level(dB)	Present Railway Vibration Level (dB)
			L_{Aeq}	L_{Aeq}	L_{Aeq}	L_{Aeq}
1.	School	SVN Public School, between Ateli RS and Narnaul RS	40	61	39	60
2.	Govt. College	Govt. College , near Narnaul RS	42	61	32	42

5.5.8 Overall Findings and Recommendations

(1) Findings on SRs from Prediction and Evaluation Results

Overall, since at SRs located along the railway lines in the urban area and city area, the existing noise levels are already higher. Thus it is recommended that DFC alignment should avoid the urban and city areas not to increase the noise levels. The review of the DFC alignment has been conducted from the point of view of socio environment and land acquisition, it is suggested to review the alignment in terms of ambient noise control as well.

While in the detour routes the impacts to residents would be small; however, the railway noise would be newly added to the residents' life, and the appropriate mitigation measures should be prepared for SRs and residences along the railway line.

In the detour section, at the SRs where the additional impact of the noise is large, it is suggested to adopt necessary mitigation measurements such as lowering the train speeds and establishing soundproof walls in the Detailed Deign stage.

(2) Consideration of the Noise and Vibration Measurement at Residences besides SRs

In this study, SRs were selected as noise and vibration measurement sites as the representative or typical sites by considering various factors of the study such as the purpose, the survey period, availability of the measurement methodology, noise and vibration standards and environmental consultants in India. It is suggested that the noise and vibration survey should be conducted at residences along the railway lines where actual affected people live in the Detailed Design stage.

(3) Implementation of Railway Noise and Vibration Mitigation Measures

As this study result shows, at SRs in the urban and city area, the existing ambient noise and vibration tend to be high due to the traffic, people nearby, their own religious activities, etc. Moreover, the interview survey results show that not only railway noise but also road traffic are environmental concerns of the residents. Additionally the horns from trains were also identified a significant noise contributor. Therefore, the railway noise and vibration mitigation measures should be adopted gradually in accordance with the rise in environmental awareness especially for noise and vibration.

(4) Baseline Data Collection of Railway Noise and Vibration and Establishment of Prediction and Evaluation Methods

1) Establishment of the Methods of Railway Noise Monitoring

For further detailed noise and vibration monitoring, it is necessary to obtain the baseline data as well as the established methodologies of railway noise and vibration measurement. Since there is very limited data on noise and vibration in India there is a need to conduct extensive railway noise and vibration survey is to be conducted. Although there are railway noise and vibration survey data and methodologies available in Japan, they are not applicable to India since there are various different conditions such as the railway and train design and operation.

2) Establishment of the Methods of Railway Vibration Monitoring

In Japan, the ambient and railway vibration measurement covers only direct impacts to human beings and vertical movement of vibration. However, in India, the horizontal impacts are considered because the major concern of vibration is impacts on buildings. Therefore, vibration measurement in buildings should be also considered for the further study in the Detailed Design stage.

CHAPTER 6 STAKEHOLDER/PUBLIC CONSULTATION MEETING

6.1 PUBLIC CONSULTATION

The public consultation is an important tool of information, dissemination and awareness creation during the planning stage of the project. It provides valuable inputs regarding successful implementation of the project besides ensuring public participation and involvement in the process.

In order to assess feasibility of development of dedicated multimodal high-axle load freight corridor with computerized control for Delhi-Howrah, stakeholder/public consultation meetings were organized in all three phases of the study.

- Phase I- First Stage (February 2007)
- Phase II – Second Stage (June-July 2007)
- Phase III – Third Stage (August-September 2007)

1st and 2nd phase public consultation meetings were conducted in the district to disseminate information and make affected people aware about the project and seek their suggestions about proposed DFC respectively. Stakeholders were invited from all the villages, Gram Panchayats and blocks and towns, which were likely to be affected in the parallel section and the detour route due to land acquisition in the proposed DFC project. The stakeholders expressed their views and provided valuable suggestions in respect to rehabilitation and resettlement issues and other social-environmental concerns. It was followed by village feedback meeting organized by field staff in order to know the understanding and opinions of the villagers about the proposed DFC Project. The village meetings were conducted in each affected village of the district. Contents of draft NPR -2006 were discussed with Gram Panchayat and affected persons and their suggestion were taken on R&R issues. In the village meetings, field staff assisted Gram Panchayat to constitute Village Rehabilitation Committee (VRC) in each affected village. Record of the village meetings is attached in Annex-6.

In the 3rd phase of Public consultation meeting, primary stakeholders including Panchayat members, members of village rehabilitation committee, directly affected persons and other stakeholders were present. The Gram Panchayat representatives and VRC members proposed mitigation measures for social and environment impacts and presented their views and suggestion in respect to resettlement and rehabilitation measures. Gram Panchayat and VRC members submitted expressed their concerns in writing.

6.2 STAKEHOLDERS

Various categories of stakeholders ranging from Project Affected Persons to government officials to other opinion leaders such as NGO activist and media persons were selected in order to explore the feasibility of development of "dedicated high axle load multimodal freight corridor" and to discuss social and environmental impacts, including the issue of resettlement and rehabilitation. The various categories of stakeholders were selected to attend the public consultation meeting, which are as follows:

- PAPs: Project Affected Persons
- Govt. Officials: local administration, revenue department, land acquisition officer, forest officers, railway officials, DFCCIL officials, Central & state pollution control boards, etc.
- Elected representatives: Representation from Gram Panchayat, Pradhan, local Municipal bodies, M.P and M.L.A.
- Local NGOs: Actively working on environmental & social issues in the district

- Transporters: Local transport operators, freight operators, stevedores
- Media: Local press reporters, State level & National Daily reporters, electronic media (local and National level news channel)
- Industries: Local industry owners
- Academicians: Academicians in the field of Social and Environment Sciences, Head of reputed educational institutions
- Citizens: Residents, merchants/businessmen, advocates, farmers, senior citizens, etc.

6.3 METHODOLOGY

The following steps were taken into account for conducting public consultation meetings:

Ministry of Railways has issued formal letter to Secretary, revenue department, Government of Haryana dated May 11, 2007. The letter clearly indicated that public consultation and stakeholder meetings are to be undertaken as part of studies on environmental and social issues. An Inter Ministerial Working group called Environmental Working Group (EWG) has been set up to coordinate this aspect of the study. In response, Secretary, Revenue Department has directed in the official correspondence to District Magistrates of 2 districts of Haryana to extend the cooperation to MANTEC CONSULTANTS Pvt. Ltd. to carry out ESIMMS of Development of Dedicated Freight Corridor

District Magistrate, Additional District Magistrate, Tahsildar, and Block Development officer and district forest officers were formally invited to participate in the Public Consultation Meetings.

The representatives of Panchayat Raj institutions and local Municipal bodies were personally invited.

Invitation letters were issued to the representatives of local media, opinion leaders and members of academics with the request to participate and contribute in the deliberations. The efforts were made to meet likely affected PAPs personally along with the letter of invitation.

Due care was taken to address the issues of the poor, vulnerable groups, landless and other disadvantaged sections of the society likely to be affected by the project. The main objective of the stakeholders/public consultation meeting was to

- Disseminate the information about DFC project to the general public.
- Create awareness about the project among the PAPs.
- Dispel the appearance of PAPs regarding the positive/adverse impact of the project.
- Present Draft NPR-2006, discuss its norms and provisions before the stakeholders
- Seek the suggestion of Gram Panchayat, PAPs and other stakeholders on the various involved including those related to compensation, resettlement and rehabilitation social and environmental impacts.
- Present and discuss opinion of each village committee compiled by Gram Panchayat and content of RRP

6.4 STAKEHOLDER/PUBLIC CONSULTATION MEETING

Details of 2nd and 3rd stage of the public consultation meetings of Rewari and Mahendergarh districts are given in Annex 6.1 and 6.2 and Annex 6.3 and 6.4

6.4.1 Selection of Meeting Facilitators

Suitable agencies having local presence were identified to carry out stakeholders/public consultation meetings. Preference was given to non-government organization, who had local presence, popularity and experience in social work. The acquaintance with different cross sections of society and the ability to mobilize the stakeholders of the meeting were the major selection criteria. The ability to facilitate the following activities was taken into consideration:

- Venue for the meetings
- Arrangements to be made
- Assisting in local publicity
- Invitations to the stakeholders and motivating them for participation
- Maintaining and compilation of the record and feedback organizing media coverage and
- Other local arrangements like transport, hospitality, security and smooth conduct of the meeting proceedings

In the process, Institute for Spatial Planning and Environmental Research (ISPER) was appointed to facilitate the stakeholders/public consultation meeting.

6.4.2 Method of Information Dissemination

The meeting facilitator team had visited nearly all the affected villages and requested Primary and Secondary Stakeholders to attend the meeting. Field Team distributed leaflets highlighting DFC project information and invites those people who will be affected directly by this project.

1) Method of Notifying the Meeting to the Participants

Following methods were used for notifying the meeting to the Participants

a) Date and venue of the stakeholders/Public Consultation Meeting was notified in local newspapers and the stakeholders were invited to attend to the meeting.

b) A handout containing the information about the project was distributed in likely to be affected villages.

c) Face to face meetings were organized to disseminate the information.

d) Efforts were made to publish the summary of stakeholders/public consultation meeting in local newspaper and television with the help of media.

e) The stakeholders were also reminded to attend the meeting through personal phone calls wherever possible.

2) Presentation of the meeting

6.4.3 Venue of Stakeholder/Public Consultation Meeting

The venue where stakeholders/public consultation meeting is mentioned Annex 6.1 and 6.2 and Annex 6.3 and 6.4.

6.4.4 Summary of Stakeholder/Public Consultation Meeting

(1) Rewari District

Agriculture is the main occupation of the people. Therefore implementation of the project would mainly affect livelihood of the people. The economic condition of the people is not very sound. The majority of the participant's annual income is income less than Rs. 2500. The respondents have moderate family size, i.e. 6 members per family.

The participant's places are connected with broad gauge and they are likely to be affected by the project. In the meeting it was find out that majority of respondents were well aware about the environmental condition of the area. Most of them opined the proposed project should not disturb present socio-economic conditions and environmental conditions.

Through active participations of the stakeholders, key issues relating to social and environmental impacts, compensation, resettlement and rehabilitation were identified and discussed during the public consultation meetings. Following suggestions were given by the participants

- The compensation for land acquisition on the basis of market price of land Compensation in qualitative and quantitative terms i.e. agriculture land of appropriate productive capacity in lieu of similar land acquired including appropriate irrigation facilities, similar dispensation for residential and commercial structures.
- Provision of housing units for resettlement including facilities for education, health, electricity and drinking water
- Provision of employment in project construction works to Project Affected Persons (PAPs)
- Provision of jobs in Indian Railways besides compensation to families whose land, house, shops, etc. are to be taken.
- Provision of skill training to create employability among the displaced/non-employable wards of land oustees /displaced persons/families
- Issues relating to environment protection and pollution control
- In Kaluwas and Chandwas water is supplied by pipe lines, so cross drainage system should be an affected during construction and operation phase.
- In the Chakbandi areas we need a pedestrian underground pathway to facilitate the passerbyes.
- The Detour suggested shall be kept outside the proposed master plan of Rewari.

(2) Mahendergarh District

It is investigated that agriculture is the main occupation of the people. Therefore implementation of the project would mainly affect livelihood of the people. Due to the fact, economic condition of the people is not very sound. The majority of the participant's annual income is income less than Rs. 2500. The respondents having moderate family size, i.e. 6 members per family.

It is also witnessed that participant's places are connected with broad gauge and they are likely to be affected by the project. In the meeting it is find out that majority of respondents were well aware about the environmental condition of the area. Most of them have the opinion that the proposed project should not disturb present socio-economic conditions and environmental conditions.

Through active participations of the stakeholders, key issues relating to social and environmental impacts, compensation, resettlement and rehabilitation were identified and discussed during the public consultation meetings. Following suggestions were given by the participants

- The compensation for land acquisition on the basis of market price of land
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- Provision of employment in project construction works to Project Affected Persons (PAPs)
- Provision of jobs in Indian Railways besides compensation to families whose land, house, shops, etc. are to be taken.
- Provision of skill training to create employability among the displaced/non-employable wards of land oustees /displaced persons/families
- Issues relating to environment protection and pollution control
- Common well in Uninda serving half of the village is getting affected, needs to be taken care.
- In Uninda there is a Dharmshala (A Public Facility) that seems to be falling on the ROW. If it is to be harmed, we want it to be reconstructed by the authorities in the same village.

CHAPTER 7 ENVIRONMENTAL MANAGEMENT PLAN

7.1 INTRODUCTION

Environmental Management Plan is an implementation plan to mitigate and offset the potential adverse environmental impacts of the project and enhance the positive impacts. Based on the environmental baseline conditions, planned project activities and impacts assessed earlier, this section enumerates the set of measures to be adopted to minimize the adverse impacts. Process of implementing mitigation and compensatory measures, execution, agencies responsible for their implementation and indicative costs is discussed in this chapter.

The project has overall positive impacts by providing a competitive, cost-effective, congestion free reliable mode of dedicated freight service. It will certainly reduce the congestion on the roads and facilitate fast transfer of goods. Railway being an eco-friendly mode will also enhance or at least will not degrade the environmental quality.

The development of DFC entails civil work including excavation, filling, construction of-RUB/ROB, bridge and cross drainage structures, utility shifting etc which are likely to cause adverse impacts on natural and social environment. The impacts cannot be fully avoided; however, appropriate mitigation measures are suggested to minimize and compensate the potential adverse impacts and enhance positive impacts. Most of the impacts are temporary in nature and are limited to construction phase only which can be minimized and managed by proper planning and execution. The environmental management plans includes activities for pre-construction phase, construction phase and operation phase.

7.2 ENVIRONMENTAL MANAGEMENT PROCESS

Environmental management is based on the potential impacts assessed for the project. Assessment of potential impacts is based on the review of secondary data substantiated by site visit – environmental monitoring, public consultation, household survey and discussion with concerned Govt. Dept. The implementation of Environmental Management Plan (EMP) requires the following:

- An organizational structure
- Assign responsibilities
- Define timing of implementation
- Define monitoring responsibilities

7.3 EMP DURING CONSTRUCTION AND OPERATION

The project activities will be executed in phased manner, Pre-construction Phase, Construction Phase and Operation phase. The major activities to be undertaken are described below.

7.3.1 Construction Phase

The environmental issues during construction stage generally involve equity, safety and public health issue. The Contractor is required to comply with the laws with respect to environment protection, pollution prevention, forest conservation, resettlement and safety and any other applicable law. Environmental pollution during the construction phase will be less but control of pollution during this phase is of considerable importance. The EMP is an executable part of Project, and the activities are to be guided, controlled, monitored and managed as per the provision provided. Following activities require attention during construction phase.

1) Land Acquisition/Diversion Plan

Acquisition of land is indispensable for construction of DFC. The proposed alignment traverses through Forest, Settlement and Agricultural Areas. Approximately 1.8 ha of forest land, in addition to extensive agricultural land, is likely to be acquired for the project.

- At the outset as a part of the Land Acquisition Plan, the Right of Way (ROW) along the entire DFC alignment has to be established and confirmed from the State Forest, Agriculture and Land Revenue Departments.
- Diversion of Forestland will be carried out in compliance with the Forest Conservation Act, 1980.
- The acquisition of land and private property shall be carried out in accordance to the Resettlement Action Plan (RAP).
- The list of the PAP along with compensation will be finalized and published in the local newspaper or any other publications. One month's notice will be served for appealing against the compensation (in kind or cash) to the local Land Revenue Department. If no objection is raised by the PAPs then the compensation amount as per the Land Acquisition Act 1894 (as modified in 1st September 1985 and 2003) may be paid within a period of 2 years from the date of the publication of the declaration.

It has to be ensured that all R&R activities including the payment of the compensation may be reasonably completed before construction activities starts, on any section of the DFC. No construction work will start before total compensation is paid to the PAPs.

2) Utility Shifting Plan

There are some utility services along the proposed DFC alignment such as electric lines, telephone lines, cable line, pipelines etc which may be shifted in consultation with the concerned department before commencement of construction activity. There are road crossing with the DFC. Construction of bridges will be required to maintain their utility. These structures will be shifted in consultation with the concerned Departments.

3) Construction/Labour Camp Management

- During construction phase Construction/Labour Camp will be located along the project area. Large numbers of labour population is likely to cause influx in the project area. A proper Construction Camp Development Plan has to be formulated to control degradation of the surrounding landscape due to the location of the proposed construction camp. The contractor must provide, erect and maintain necessary living condition and ancillary facilities that must be included in contract document provided to the Contractor.
- Sufficient supply of potable water may be provided at camps and working sites. If the drinking water is obtained from the intermittent public water supply then storage tanks must be provided. All water supply storage may be at least 15m away from the toilets or drains.
- Adequate washing and bathing facility must be provided in clean and drained condition.
- Adequate sanitary facilities may be provided within every camp. The place must be cleaned daily and kept in strict sanitary condition. Separate latrine must be provided for women. Adequate supply of water must be provided.
- Collection of domestic waste and its suitable disposal may be carried out on timely basis.
- The contractor must ensure that there is proper drainage system to avoid creation of stagnant water bodies.
- Periodic health check ups may be conducted. The construction contractor in consultation with State Public Health Department may provide these activities.
- At every Camp first aid facility may be provided Suitable transport must be provided to take

injured or ill person to the nearest hospital.

- Adequate supply of fuel in the form of kerosene or LPG may be provided to construction labours to avoid felling of trees for cooking and other household activities. No open fires may be allowed in camps.
- Fencing and proper lighting should secure the sites
- The construction contractor may ensure that all construction equipments and vehicle machinery is stored at a separate place/yard. Fuel storage and refilling areas may be located 500 m away from the water bodies and from other cross drainage structures.
- All the construction workers should be provided with proper training to handle potential occupational hazards and on safety and health, which include the following:
    - Environmental Awareness program
    - Medical surveillance
    - Engineering controls, work practices and protective equipment
    - Handling of raw and processed material
    - Emergency response
- Construction/labour camps may be located away from forest areas, settlements, cultural heritage & historical sites and water bodies & dry river beds.
- It should be ensured by the construction contractor that area of the construction camp be cleared of the debris and other wastes deposited on completion of construction. The land should be restored back to its original form and condition as it was prior to the establishment of the construction camps.

4) Borrow Area Management Plan

An appropriate Borrow Area Management Plan is formulated to control degradation of the surrounding landscape due to the excavation work. The national standard which applies to the manual borrowing of earth is the IRC-10: 1961.

- Borrowing of earth shall be carried out up to depth of 150 cm from existing ground level and shall not be done continuously. Slopes of edges shall be maintained not steeper than 1:4.
- Top soil (15 cm) from all areas shall be preserved in stockpiles and utilized for redevelopment of borrow/quarry areas.
- Borrow pit shall be developed as far as possible from the river side, where the inner edge of any borrow pit should be not less than 15 m away from the toe bank. As far as the borrow pits on the rear or landside are considered, it is to be avoided. Where it is unavoidable a berm, at least 25 m wide should be left between borrow pits and toe bank. The toe of the bank on the rear side should have a cover of 0.75 m to 1.25 m over the saturation line drawn at a slope of 1:6 from the high flood level on the river side.
- Borrowing of earth shall not be carried out on productive land in the event of such an occasion; contractor has to obtain permission of the engineer who is supervising the activity.
- Sources of borrow areas will be identified by the Construction Contractors
- No borrow areas will be opened without the prior permission from the local administrative bodies like Village Panchayats, State Department of Irrigation, Agriculture and State Pollution Control Boards etc.
- Reclamation of borrow area will be mandatory and must be included in the agreement made with the Construction Contractor
- Borrow pits may be located at least 1 km away from the villages and settlements.
- All borrow pits may be reclaimed.

- The quarry and borrow area will be reclaimed back. The pits formed should be backfilled by construction waste and site should be stabilized.
- Spoils may be dumped with an overlay of stocked piled top soil with respect to MoEF/SPCB guidelines.
- Borrow and quarry pits may also be developed as ponds and used for aquaculture as per local requirement and can be also developed as park or picnic spots.
- Landscaping of borrow and quarry area will be done and grasses, shrubs & tree species may be planted around the reclaimed area. Ornamental plants may be planted on the access route.
- Reclamation of borrow area will be included in the agreement of the Construction Contractor

5) Public Health and Safety

The contractor is required to comply with all the precautions as required for the safety of the workmen. The contractor must comply with all regulation regarding scaffolding, ladders, working platform, excavation, etc.

- The contractor must supply safety goggles, helmets, earplugs and masks etc. to the workers and staff.
- Adequate precaution must be taken to prevent dander from electrical equipments. Necessary light and fencing must be provided to protect the public.
- All machines & equipments used in the construction must conform to relevant Indian Standard (IS) Codes, must be free from patent defects, in good working condition, regularly inspected and properly maintained as per IS provisions.
- All workers employed on mixing of asphaltic material, cement, lime mortars, concrete etc. may be provided with protective footwear and protective goggles. Workers involved in welding work may be provided with welder's protective eye shields.
- No men below age of 18 years or women should be employed on the work of painting with products containing lead in any form. Face mask may be supplied to for use to the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
- All reasonable measures must be taken to prevent public from fire, flood etc.
- All necessary steps must be taken to prompt first aid treatment of all injuries likely to sustain during the course of work.
- The contractor must conform to all anti malarial instructions, including filling up of borrow pits which may dugged under the project.
- Work that affect the use of side roads and existing accesses must not be taken without providing adequate provision.
- On completion of the works all the temporary structures may be cleared away, all rubbish disposed, excreta and disposal pits or trenches filled in and effectively sealed off and the whole of the site left clean and tidy.

7.3.2 Operation Phase

During Operation phase maintenance of water quality and distribution of water along DFC alignment and command area is most important task besides other activities

7.4 ENVIRONMENTAL MANAGEMENT PLAN AND RESPONSIBILITIES

Table 7-1 presents summary of Environmental Management Plan (EMP) with the objective of minimization of adverse environmental impacts as discussed in part III. The table covers all possible environmental issues involved in the project and necessary mitigation measures. Taking appropriate mitigation measures for the construction phase is the responsibility of the construction contractor and the Environmental Engineer of the Construction supervisor would supervise the implementation of EMP.

The mitigation measures during the operation phase will be implemented by Environmental Management Unit (EMU) of Railway Dept., which includes an Environmental-In-Charge who will supervise the implementation of EMP. Thus the overall responsibility for the implementation of mitigation measures will be with the Construction Contractor during the construction phase and Railway Dept during operation phase. The details of Environmental Management Program and Environmental Management Unit (EMU) are discussed in the subsequent paragraphs.

Table 7-1 Environmental Management Plan

No	Environmental Issue	Actions to be Taken	Implementation By	Supervision By
Pre- Construction Phase				
1.	Removal of Trees	Approximately 2210 trees are likely to be felled in the existing and acquired area for the proposed corridor The forest land along the railway line is likely to be acquired for the project will be compensated by providing value of land as per Net Present Value (NPV) in Chapter 5 Double area of land may be provided for Forest Dept for carrying Compensatory afforestation. Compensation may be provided for plantation of trees Double area of land may be provided for Forest Dept for carrying Compensatory afforestation. Compensation may be provided for plantation of trees	Forest Dept. / EMU	EMU
2.	Land acquisition/ Diversion	Ownership of land within the ROW and at Junction station should be confirmed Number of Project Affected Persons (PAPs) to be identified Resettlement Action Plan to be prepared for the PAPS and provide compensation in compliance with National Resettlement and Rehabilitation (R&R) policy Information dissemination and community consultation	EMU /NGOs as collaborating agency	Revenue Dept / DFCCIL
3.	Relocation of Cultural and Religious Properties	Religious structures to be shifted only after public consensus. Relocation should be complete before construction work is taken up.	Construction Contractor	DFCCIL
Construction Phase				
1.	Soil	Suitable protection measures consisting of bio-engineering techniques such as plantation of grasses and shrubs & check dams, may be provided to control erosion. Borrow areas may be finalized in concern with ecological sensitivity of the area. Agriculture land may not be used as borrow areas. Priority may be given to degraded area for excavation of borrow material. Rehabilitation of borrow area may be taken under the project. Construction work may be avoided during rainy season to evade erosion and spreading of loose material. Top soil removed from agricultural land may be stored separately in bundled areas and utilized during plantation or refilling of excavated area.	Construction Contractor /EMU	EMU/CS

No	Environmental Issue	Actions to be Taken	Implementation By	Supervision By
2.	Water Bodies	Provision of temporary drainage arrangement due to construction activities must be made by Contractor and suitable and strict clause must be incorporated in General Conditions of Contract document for its effective implementation. Silt fencing may be provided near water bodies Proper cross drainage structure may be planned at the crossing of the canal in consultation with Irrigation Department Proper drainage may be planned in the area to avoid water logging	Construction Contractor /EMU	EMU/CS
3.	Flora	Felling of trees must be undertaken only after obtaining clearance from the Forest Dept. -forest areas, Railway Dept and local bodies outside forest areas Trees falling outside the ROW should not be felled. Compensation must be provided before initiating construction activity. Fruit bearing trees may be compensated including 5 years fruit yield. Labour Camps and office site may be located outside & away from Forest area. Green belt development may be undertaken in the wasteland near railway line to enhance aesthetic and ecological value. Social forestry may be practiced for success of the plantation. Local people can be involved in plantation and maintenance of plantation as part of the project in consultation with Forest Department.	Forest Dept./ Construction Contractor / EMU	EMU/CS
4.	Fauna	Crossing passages must be made for wildlife near forest areas such as under pass followed with some plantation so that it resembles with the habitat of wildlife and facilitate crossing of wildlife in forest area. Ponds may be developed inside forest areas as the birds prefer water bodies. Borrow areas can be also developed as ponds with grasses and shrubs planted around it. Silt fencing may be used near water bodies to avoid runoff into the water bodies Construction activity may be avoided during night hours in forest area. Poaching must be strictly banned in the Forest area. It may be ensured by the Contractor that no hunting or fishing is practiced at the site by any of the worker and that all site personnel are aware of the location, value and sensitivity of the wildlife resources Awareness program on Environment and Wildlife Conservation may be provided to the work force. Forest Act and Wildlife Act may be strictly adhered to.	Forest Dept./ Construction Contractor / EMU	EMU/CS
5.	Biodiversity	The DFC is not likely to affect the biodiversity as there are no endangered and threatened species of flora and fauna. The Project can support wildlife conservation program to contribute towards biodiversity and sustainable development	Forest Dept./ Construction Contractor / EMU	EMU/CS
	POLLUTION MONITORING			
1.	Air	Adequate dust suppression measures such as regular water sprinkling on construction sites, haul & unpaved roads particularly near habitation must be undertaken to control fugitive dust Plantation activity may be undertaken at the construction sites Workers may be provided with mask to prevent breathing problems Trucks carrying soil, sand and stone may be duly covered to avoid spilling. Low emission construction equipment, vehicles and generator sets may be used Plants, machinery and equipment should be handled so as to minimize generation of dust. All crusher used in construction should confirm to relative dust emission devises Air quality monitoring may be conducted at construction sites.	Construction Contractor / EMU	SPCB / SDOE / EMU/CS

No	Environmental Issue	Actions to be Taken	Implementation By	Supervision By
2.	Water	Silt fencing may be provided near water bodies to avoid spillage of construction material. Discharge of waste from construction/labour camp into water bodies may be strictly prohibited. Construction methodologies with minimum or no impact on water quality may be adopted, disposal of construction wastes at designated sites and adequate drainage system may be provided. Project design may take care of irrigational canal and proper culverts may be provided so that irrigation setup is not disturbed Construction activity may be prohibited during rainy season near water bodies. Water quality monitoring may be conducted during construction phase.	Construction Contractor / EMU	SPCB / SDOE / EMU
3.	Soil	Asphalt emulsifier must be handled with caution and any leakage detected must be immediately rectified. Construction work should not be done during rainy season to avoid erosion and spreading of loose material Top soil removed during excavation work should be stored separately in bunded area and should be utilized during plantation or refilling of excavated area.	Construction Contractor / EMU	EMU/CS
4.	Solid Waste	Construction work must be carried in such a way that minimum or no solid waste is generated at construction site. Extra earth material produced may be utilized for refilling of borrow areas. Rainy season may be avoided to minimize spreading of loose materials. Solid waste management may be framed for camp areas. Dustbins may be provided in the Camps. Proper sanitation facilities must be provided in Camp by the Contractor.	Construction Contractor	SPCB / SDOE / EMU/CS
5.	Noise & Vibration	Modern technologies producing low noise may be used during construction. Construction equipment's and vehicles must be in good working condition, properly lubricated and maintained to keep noise within permissible limit. Temporary noise barriers installed at settlements and forest area, if required. Plantation may be carried at the work site. Head phones, ear plugs to be provided to the workers at construction site. Noise level monitoring must conducted during construction phase. All vehicles, equipment and machinery used in construction should be fitted by exhaust silencers. Equipments should be maintained regularly and soundproof gadgets should be used. Temporary sound barriers should be installed near sensitive locations near settlements and Forest area, if required Provision of ear-plugs to heavy machinery operators Plantation along the DFC should be maintained	Construction Contractor / EMU.	SPCB / SDOE / EMU/CS
6.	Land Subsidence	Plantation must be carried to control erosion.	Construction Contractor	EMU/CS
7.	Bottom Sediment	Silt fencing may be provided to avoid runoff into the river. Construction activity should be taken in dry season to avoid spreading of construction material and minimize impact on water quality.	Construction Contractor	EMU/CS
Operation Phase				
1.	Maintenance Plantation	Provision for maintenance of plantation must made for at least three years. Plantation may be taken to replace dead sapling. Survey of survival of plants may be taken annually. Lopping of branches may be undertaken to remove obstruction, if any.	EMU	DFCCI
2.	Air Quality	Plantation should be conduct and maintained along DFC. Green belt development with proper species should be undertaken on priority basis. AAQ monitoring, at all Junction station sites and along DFC under the guidance of SPCB.	EMU	SPCB / SDOE (State Department of Environment)

No	Environmental Issue	Actions to be Taken	Implementation By	Supervision By
3.	Water Quality	Waste Collection facility should be provided at all Junction station Proper drainage system should be provided at all Junction stations Water quality monitoring at the Junction station stations under the directives of SPCB.	EMU	SPCB / SDOE (State Department of Environment)
4.	Noise & Vibration	Noise and Vibration monitoring may be conducted in operation phase at the Sensitive Receptors (SRs) identified.	EMU	SPCB / SDOE (State Department of Environment)

7.5 ENVIRONMENTAL BUDGET

The cost of compliance for environmental issues must be included in the Bill of Quantity for the implementation of EMP, although most of the aspects will be covered under engineering head such as are:

Utility shifting

- Embankment
- Noise barrier
- Shine boards along construction sites
- Underpass for animals
- Culverts for irrigational canals

However there are issues, which are independently covered under Environmental Budget such as plantation along DFC, monitoring, enhancement measures, sanitation facility at labour camp, and solid waste disposal at site. Budget for Resettlement and Rehabilitation shall be prepared separately. The tentative environmental budget is given Table 7-2.

Table 7-2 Proposed Budget for Rewari and Mahendragarh Districts

S. No	Particulars	Description	Rate	Total (Rs.)
1.	Water Quality Monitoring	Once in each three seasons in each district*)(1x3x2)*	20,000 / station	120,000
2.	Air Quality Monitoring	Once in each three seasons at junction sites and construction locations near SR *(recurring cost)in each district (1x3x2)*	20,000 / station	120,000
3.	Noise & Vibration Level Monitoring (Construction Phase)	Once in each three seasons at Junction Sites /SR locations *(recurring cost) in each district(1x3x2)*	55,000	330,000
4	Noise & Vibration monitoring (Post construction phase)	Near SR once in each three season in each district (1x3x2)	55, 000	330,000
5	Plantation (including maintenance for 3 years)	Plantation along DFC and Service Road (parallel section) in each district	120 / plant	396,000
		Total		396,000
6	Water, Sanitation facility labour camp	In each district	5 lakh/ camp	1,000,000
7	Solid Waste Management	In each district	Lump sum	400,000
8	Borrow/ Quarry area Reclamation	In each district	Lump sum	2,000,000
9	Dust suppression	In each district	Lump sum	400,000
10	Training	In each district	Lump sum	200,000
11	Manpower (Construction Supervision)	Environment Expert -2 *(recurring cost)*	1,00,000 / month	2,400,000
		Social Expert-2 *(recurring cost)*	1,00,000/ month	2,400,000
	Grand Total			10,096,000

The tentative cost estimated for implementation of Environmental Management Plan is Rs. 10,096,000. Some cost fall under recurring head mentioned in the above table.

7.6 RECOMMENDATIONS

Significant environmental issues associated with this project proposed to be taken in detail under EIA level study are mentioned as under:

- Study of drainage and flooding pattern in and around the project site and development of drainage management plan
- Borrow area management plan including identification of probable sites and its chemical analysis for toxic contaminants.
- The ESIMMS was conducted with the secondary data of 1 year as well as a short-term field surveys. Thus, the base line data through 1 year should be collected at the further stage of the project.

CHAPTER 8 RESETTLEMENT AND REHABILITATION PLAN (RRP)

Resettlement and Rehabilitation Policy including "RRP Frame Work" is under consideration with Government of India and will be disclosed as a separate process.

CHAPTER 9 ENVIRONMENTAL MONITORING PLAN

9.1 INSTITUTIONAL FRAMEWORK

All the personnel engaged in the project right from the planning, through construction and operation stage will be directly or indirectly responsible for environmental conditions in and around the project site. However a group of specialists will coordinate all the activity related to the environment during the different stages of the project. This core group will be called as Environmental Management Unit (EMU).

DFCCIL (Dedicated Freight Corridor Corporation of India) is responsible for Project development. An Environmental Management Unit (EMU) is proposed under the DFCCIL at Centre. Environmental Expert will be appointed at the centre. Under EMU State level Environment Specialist will be responsible for implementation and monitoring of EMP in State. District level Environmental officer will ensure implementation of EMP in a district or in a package of the State DFC.

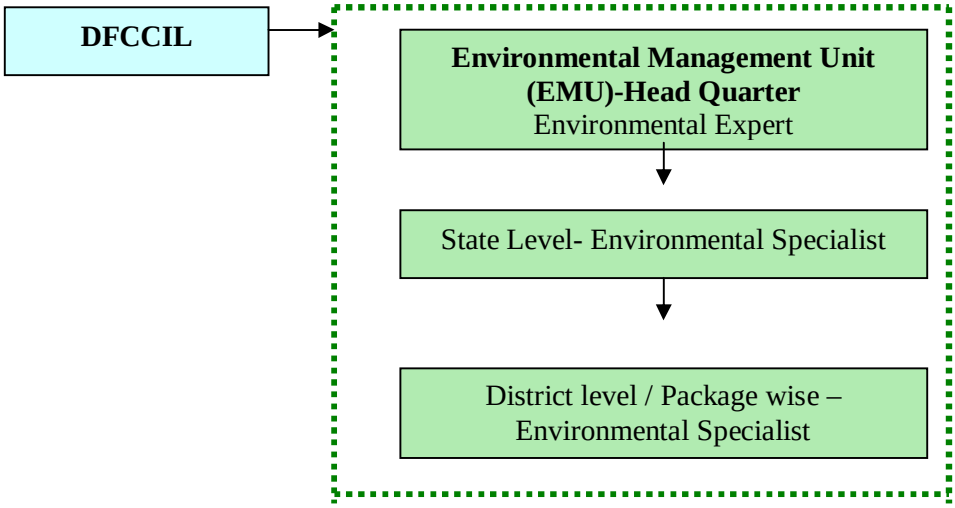


Figure 9-1 Proposed Structure of Environmental Management Unit

Table 9-1 Responsibility of Environmental Management Unit

Environmental Expert- Centre	Environmental Specialist – State level	Environmental Specialist- District level/Package wise
Overall Responsibility for policy Guidelines, Coordination, Planning, Implementation for all States Review of specifications during project preparation to ensure their adequacy and suitability with respect to the recommendations of the Management Plan. Dissemination of relevant environmental information indicating amendments to Environmental Acts & Rules Ensure Environmental cost provided in the budget. Develop Data bank on Environmental issues	Policy Guidelines, Coordination, Planning, Implementation at State Level Monitor the environmental aspects of project Ensure that the environmental requirements and the mitigation measures proposed in the Management Plan are implemented. Undertake compliance monitoring to provide periodic checks Maintain Environmental Data of all Districts. Ensure Budget for EMP Develop monitoring Formats Coordination with align Departments.	Responsible for implementation of EMP in District / Package Ensure compensation is provided for private trees Ensure compensatory afforestation is undertaken. Liaise with local groups, Forest Dept. & PHD and other Departments, etc. on environmental issues Undertake environmental training activities Ensure restoration of Borrow Areas Pollution Monitoring Construction Camp Management Green belt development and landscaping along the DFC Maintain Environmental Compliance Report.

Construction Phase

The District level Environmental Specialist will look after the implementation of EMP in their respective Districts/Packages and send compliance report to the State environmental specialist. Persons deployed must be familiar with the National Environmental Legislation

1) Construction Supervisor

- During Construction phase Construction Supervisor (CS) may be engaged to supervise Contractor's activity.
- Environment officer may be appointed by Construction Supervisor for each package to see environmental compliance.

2) Construction Contractor

- Contractor has to provide one full time person with background in Environment field.
- Environment specialist engaged by contractor must work in co-ordination with Environment officer of Construction Supervisor.

Environmental officers of Construction Supervisor & Construction Contractor will report to Environmental Specialist, EMU.

Operation Phase

The Environmental personnel deployed in construction phase in EMU may continue in operation phase to implement and supervise activities involved in operation phase.

9.2 ENVIRONMENTAL MONITORING -CONSTRUCTION PHASE

Environmental monitoring is essential to monitor the changes in environmental aspects due to the project activities. Monitoring should be conducted during construction and operation phase. During construction phase monitoring includes:

i. Monitoring of environmental aspects such as water, air, noise & vibration and plantation program. Construction Supervision Consultant would suggest final locations and time for monitoring of suggested parameters within allocated budget in consultation with EMU.

ii. Monitoring of implementation of mitigation measures suggested in EMP

- The Construction Contractor should implement the mitigation measures suggested and Construction Supervisor in co-ordination with EMU should verify the same and provide recommendation, if required.
- The Construction Supervisor must prepare an Environmental Management Action Plan (EMAP) for compliance.
- The Environmental-in-charge of Construction Supervisor should conduct on-site verification and should provide documentary proof to EMU on mitigation measures taken by Construction Contractor.
- Construction Supervisor must Provide Monthly Progress report to EMU.

Environmental Monitoring formats required for EMAP is attached in the annex. These formats may be further amended and improved as per requirement.

9.3 ENVIRONMENTAL MONITORING - OPERATION PHASE

During operation phase, EMU may undertake the monitoring program for environmental aspect.

- Noise and Vibration
- Survival rates of plantation should be taken up to 3 years in operation phase, re-plantation should be carried to replace dead sapling.

9.4 ENVIRONMENTAL MONITORING FRAME WORK

Environmental Monitoring Framework is given in Table 9-2.

Table 9-2 Environmental Monitoring Framework

S. No	Environmental Component	Parameter	Standards	Location	Frequency	Implementation	Supervision
1	Air Quality	SPM, RPM, CO, NOx, SOx	CPCB Standards	Stretch of DFC in progress near settlements and junctions & stations	3 times in a year (Once in every season except monsoon)	CC	CS / EMU
2	Water Quality	pH, DO, BOD, TDS, Total Coliform , Oil & Grease, Phenols Pb, Zn Hg Cl Fe, Na	CPCB Standards	Near water bodies	During construction stage	CC	CS/ EMU,
3	Sediment Quality	pH, Conductivity, Texture, Total OM, Total N, Na SAR, K, and Oil content		Near water bodies	During construction stage	CC	CS / EMU,Railway Dept.
4	Noise	Noise level on dB(A) scale	CPCB Standards	Junction & Stations and Settlements along DFC.	3 times in a year (except monsoon season)	CC	CS / EMU,
	Operation Phase						
1.	Air Quality	CO, NOx, SOx, RPM	CPCB Standards	At Compensatory afforestation site and along DFC.	3 times in a year (except monsoon)	EMU,	EMU / SPCB
2	Noise & Vibration Level	Noise level on dB(A) scale	CPCB Standard	Junction & stations and SR along DFC.	3 times in a year (Once in every season)	EMU	EMU / SPCB
3	Plantation	Survival rate	survival rate may be calculated annually	At Compensatory afforestation site & along DFC.	Annually for 3 years	State Forest Dept./ EMU	EMU

The responsibility for implementation and supervision of mitigation measures for each environmental issue has been also provided in Chapter 5.

9.5 ENVIRONMENTAL AWARENESS AND TRAINING

For implementation of EMP awareness on environmental issues is indispensable. It is essential that senior officials should grasp completely the features of environmental management; immediate short term training will be required for Railway Dept. staff on environmental awareness.

For management of environment it is required to develop ability to communicate and work with community and understanding the socio-political dynamics prevalent in the region. Following the setting up of the Environmental Management Unit, the need for additional and specialized training should be examined and appropriate training should be undertaken.

During construction phase training/awareness program should be organized by the EMU for Project Implementation Unit (PIU) Staff and the Contractor twice a year. During operational phase one workshop/awareness program should be organized at district level each year for the first 3 years. The training modules suggested are given in Table 9-3.

Table 9-3 Proposed Training Modules

S. No	Target Group	Description	Method
1.	RAILWAY DEPT. Managers and All staff of Environmental Management Unit	Environmental Awareness Environmental Regulations, Provisions of various acts, EIA notifications, process and methodology for environment conservation	Lectures
2.	Environment Specialist (site in charge) PIU Staff, and Contractor's Staff	Implementation of Environmental Management Plan Planning, Design and execution of mitigation and enhancement measures, monitoring and evaluation of environmental conditions during construction and operation.	Workshops and Lectures
3.	Environmental Specialist (site in charge), PIU staff Contractor's Staff	Environmentally Sound Construction Practices Clean Construction Technology, Waste minimization and management in construction processes, storage and maintenance of equipments/ materials, Control of soil erosion, transplantation and compensatory plantation including maintenance and Construction Camp Management.	Seminars Lectures

9.6 MONITORING AND EVALUATION OF R&R PLAN

Monitoring and evaluation are critical activities toward the finalization of the process of resettlement and rehabilitation. Monitoring involves periodic checking to ascertain whether the resettlement and rehabilitation activities are in progress in helping PAFs taking roots into the new resettlement areas. Evaluation is essentially a summing up of the progress of resettlement and rehabilitation at the end of the Project assessing the actual achievement in comparison to those aimed at during the implementation period.

DFCCIL will be responsible for internal monitoring through their Project Implementation Unit, Chief Resettlement Office, and NGOs. It should prepare quarterly reports on the progress of the implementation of resettlement and rehabilitation plan.

Independent monitoring agency or a local consulting firm or a local NGO will carry out an external monitoring of the implementation of resettlement and rehabilitation plan. It will report on a half yearly basis to DFCCIL and funding agency. DFCCIL should select and hire these consulting firm/ NGO.

9.6.1 Internal Monitoring

The resettlement and rehabilitation plan includes indicators and bench marks for achievement of the objectives, which includes as follows:

(1) Process indicators

DFCCIL and its project office will monitor process of the resettlement and rehabilitation, which includes project inputs, expenditures, staff deployments, etc. DFCCIL should collect the information from the project site and assimilate in the form of quarterly progress report to assess the progress and results of the implementation of resettlement and rehabilitation plan. In case there was a delay or any obstacles on the implementation works, adjust the work programme. The following are major items of monitoring for process indicators;

- Information campaign and consultation with PAFs;
- Status of land acquisition and payments on land compensation;
- Resettlement of PAFs

(2) Output indicators

Output indicators are as follows:

- The results in terms of numbers of affected persons compensated and resettle; and
- Incomes restored; and
- Additional assistance provides

(3) Impact indicators

Impact indicators are the factors related to the long-term effect of the project not only on PAFs but also on those people in the project affected area as a whole. Field level monitoring will be carried out as follows:

- Review of census information for all PAFs;
- Consultation and informal interviews with PAFs on the up-to-date feeling of them on their life in the resettlement areas;
- In-depth case studies if there were any particular case worth paying special attention;
- Informal sample survey of PAFs;
- Key informant interviews and
- Holding a number of community meetings at the resettlement site as well as the site directly affected by the Project.

A Performa data sheet will be used in order to carry out monitoring works at the field level

9.6.2 External Monitoring

External monitoring body will be hired for the monitoring works. It should identify and select impact indicators, impact assessment through formal and informal surveys with the PAFs, consultation with local government officials and community leaders, assess efficiency of the process of rehabilitation procedures in terms of effectiveness, sustainability of the lives of PAFs, draw attentions for the lessons learned during the period since resettlement and rehabilitation activities commenced and formulate the future rehabilitation policy and planning method.

Major items of monitoring would be as follows:

- Review and verification of the internal monitoring reports prepared by Project Implementation Unit and the field offices;
- Review of the socio-economic baseline census information of the PAFs;
- Socio-economic conditions of the PAFs in the post-resettlement period;
- Opinions of the PAFs on the entitlements, compensations, general assistance, alternative development programmes to livelihood restoration programmes and their timetable;
- Actual changes of the conditions of housing and income levels of the post-resettlement period;
- Livelihood
- Rehabilitation of non-title settlers; and
- Grievance procedures.

After the project implementation, NGOs assisting chief resettlement officer will conduct information and community consultation programme (ICCP) in the project area in respect of resettlement and rehabilitation plan. It is a part of social environment monitoring plan of the resettlement and rehabilitation of PAFs. The following is the tasks of NGOs:

1) Assist chief resettlement officer in implementation of resettlement and rehabilitation plan including mitigation measures for avoiding adverse effects imposed on PAFs by the Project;

2) Prepare information materials in local language explaining resettlement and rehabilitation plan such as project brochures and pamphlets to be used for disclosure of information regarding the project objectives, entitlement, compensation principles and procedures, and implementation schedules;

3) Advise and assist chief resettlement office in the provisions of implementation of resettlement and rehabilitation plan concerning livelihood and income restoration programmes;

4) Work in close cooperation with relevant state and central government departments and district administration involved in the valuation of assets acquired and payment of compensation;

5) Educate the PAFs on their right to entitlements and obligations;

6) Ensure that the PAFs are paid their full entitlements due to them;

7) Facilitate and organize training programmes and provide support and gather information to PAFs for income restoration programme;

8) Assist the PAFs in redressing of their grievances through the grievance redress mechanism set up for the Project;

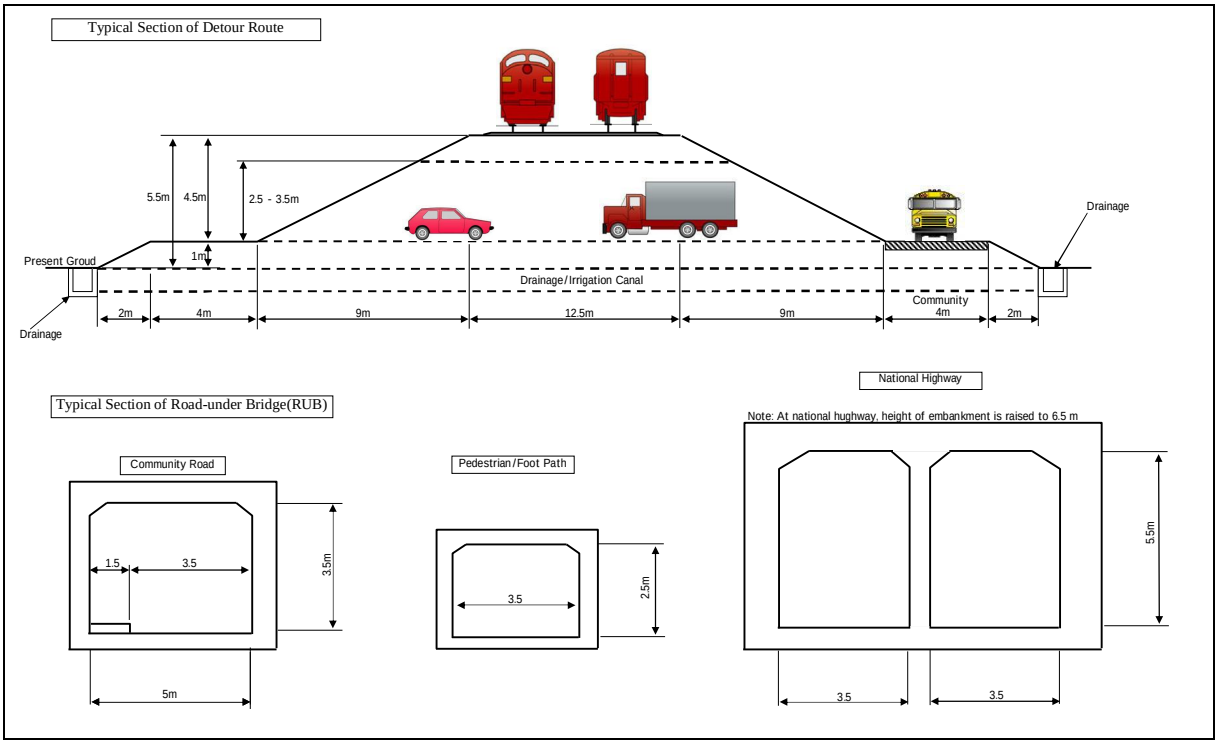
9) Disseminate information for all the PAFs about the functional aspects of the various district level committees set up for the Project and assist the PAFs in benefiting from such institutional mechanism;

10) Assist the Project Implementation Unit of DFCCIL in ensuring social responsibilities of the Project, such as compliance with the labour laws, safety regulations, prohibition of child labour, HIV/AIDS and gender issues; and

11) Participate in monitoring system and prepare progress reports.

ANNEX -3.1

TYPICAL SECTION OF DETOUR ROUTE



Typical Section of Detour Route

ANNEX – 4.1

Natural Environmental Survey Questionnaire
(Based on visual inspection & local enquiry)

Questionnaire No. **Latitude: _____ Longitude: _____**
Nearest Railway station: _____

Village / town: _____

District: _____ State: _____

Name of Respondent (if any): _____

1.	**What is the general topography?**	**Plain**	**Undulat**	**Hillock**	**Slope**	**Ridg**
2.	**What is the surface soil quality?**	**Rock**	**Sandy**	**Clayey**	**Loam**	**Othe**
3.	**Is there any natural vegetation?**	**If**	**Fore**	**Plantati**	**Scru**	**Aquat**	**No**
		Distance from corridor:					
4.	**Predominant species sighted?**	**Name:**					
5.	**Any reserve or protected forest?**	**Ye s**	**Specify:** **Distance from corridor:**			**N o**
6.	**Is there any railway plantation?**	**Ye**	**If yes, total length of plantation & plants/100mts**			**N**
	List of predominant species:	**Name:**				
7.	**Is there any large water body?**	**If**	**Natur**	**Artifici**	**Utility**	**Cultu**	**No**
		Distance from the corridor:					
8.	**What is its use profile?**	**Domes**	**Fisher**	**Irrigati**	**Recreati**	**No**
9.	**Is there any canal around?**	**If**	**Natur**	**Embanke**	**Irrigat**	**Sewag**	**No**
		Running	**Distance from**	**Cutting**

Position of canal:

10. **Is there any River?** | **If yes, Name:** | **No**

Position of river: | **Running** | **Distance from** | **Cutting**

11. **Water availability in the river** | **Through out the year** | **Through out, except dry** | **Only during**

12. **If so, how is it used?** | **Navigati** | **Domesti** | **Irrigati** | **Fishin** | **Non**

13. **Any additional embankment?** | **If yes** | **Earthe** | **Concre** | **Roads** | **No**

Running	**Distance from**	**Cutting**

14. **Sources of drinking water:** | **Dug well** | **Shallow hand** | **Deep tube** | **Pond**

15. **Depth of nearest aquifer for drinking water:** | **<50 ft.** | **50 –100** | **100 – 400** | **>400**

16. **What are the major cultivable?** | | | | | |

17. **Present rate of production (quantify).** | **More than** | **Sufficient** | **Insufficient** | **Increasing/**

18. **Distance of settlement from ROW** | **Within** | **<100** | **100-500** | **>500**

19. **Predominant settlement types:** | **Concre** | **Earthen** | **Tempor** | **Slum** | **None**

20. **Any area of landslides or quarry?** | **Yes** | **Specify:** | **No**

21. **Distance of nearest burrows area.** | **Within** | **<100** | **100-500** | **>500 mts**

Ye	**If yes, Type & distance from the corridor:**	**N**

22. **Is there any traditional mining**

23. **Any cultural/ Historical asset?** Ye | If yes, distance from the corridor: | No

24. **Existing Utility services:**

Underground pipeline ☐ **H.T.Line** ☐ **Cable line** ☐ **Others** ☐

25. **Is there any flooding problem?** Ye | H.F.L, Frequency: & distance of flooded area: | No

26. **Any water logging problem?** Ye | Spread, Frequency: & distance of inundation: | No

27. **What are the problems due to existing railway alignment?**

Noise	Air	Accide	Vibrat	Others:

28. **Any specific components not covered in the questionnaire:** _____

_____

29. **Perception of local people about problems to be encountered due to the freight corridor:**

_____

_____

30. **Any suggestion for minimising the impacts and improvement of corridor:** _____

_____

_____

31. **Special note:**

Part II (To be filled up additionally in case of Detour area)

1. **What are the type of land use through which the detour will be made?**

Agriculture	**Orchard**	**Natural**	**Fallow**	**Settleme**

2. **If settlement falls under ROW how much population will be affected?**

< 50	**51 – 100**	**101 – 250**	**251 – 500**	**>500**

3. **Is there any large water body coming within the proposed ROW?**

Yes	**If yes, the size:** **Use:**	**No**

4. **What is the expectation of the people – whose land will be taken, on R&R Package?**

_____

_____

5. **Any other relevant issues to be addressed.**

_____

Name of Enumerator: **Signature**

ANNEX– 4.2

List of Flora in Rewari District

S. No	Botanical Name	Hindi Name
1	Acacia jacquemontii	Babul
2	Acacia leacophloea	Raunj
3	Acacia leucophloea	Ronj
4	Acacia nilotica Var.Indica	Kikar
5	Acacia Senegal	Khairi
6	Acacia Senegal	Khairi
7	Acacia tortilis	Israeli Kikar
8	Achyranthes aspera	Puthkanda
9	Adhatoda vasica	Bansa
10	Aerva javanica	Bui
11	Agave Americana	Keora
12	Ailanthus excelsa	Ulloo neem
13	Ailanthus excelsa	Maharukh
14	Albezzia lebbek	Siris
15	Albizia lebbek	Siris
16	Alysicarpus monilifer	--
17	Amaranthus gracilis	Cholai
18	Andropogon laniger	Khawi
19	Anogeissus pendula	Dhauk
20	Argemone maxicana	Kandheli or Kanteli
21	Aristida hertigluma	--
22	Asphodelus tenuifoius	Piaza
23	Azadirachia indica	Neem
24	Azadirachta indica	Neem
25	Badhinia racemosa	---
26	Balanites aegyptica	Hingo or Hongot
27	Bauthinia variegata	Kachnar
28	Bombax ceiba	Semal
29	Bombax celba	Semal
30	Boswellia serrata	Salai
31	Bougainvillea spp.	Bougainvillea
32	Butea monosperma	Dahk
33	Calotropis procera	Aak
34	Cannabis sativa	Bhang
35	Capparis deciduas	Kair or Karir
36	Capparis horrida	Hins
37	Carissa spinarum	Karaunda
38	Cassia fistula	Amaitas
39	Cassia listula	Amaltas
40	Cassia tora	Panwar
41	Cenchrus biflorus	Bhurat
42	Cenchrus ciliaris	Anjan
43	Cenchrus setigerus	--
44	Chenopodium album	Bathua
45	Chrysopogon montanus	Dhotu
46	Citrillus colocynthus	--
47	Cordia dichrma	Lasoora
48	Cordias dichtoma	Lasura
49	Crotolaria juncea	Bui
50	Cssia siamea	--

S. No	Botanical Name	Hindi Name
51	Cucumis pubescens	Kachri
52	Cuscuta reflexa	Akash bel
53	Cymbopogon martinii	--
54	Cyperus rotundus	Motha
55	Cyrodon dactylon	Doob
56	Dactyloctenium aegyptium	Makhra
57	Dactyloctenium sindicum	Tantia
58	Dalbergia sissoo	Shisham
59	Datura alba	Dhatura
60	Delonix regia	Gulmohar
61	Desmostachya bipinnata	Dab
62	Dichanthuim annulatum	Palwan
63	Digitaria ciliaris	Jharania
64	Dodonaea viscose	Alyer
65	Echinochloa colonum	Sanwak
66	Eichhirnia crassipes	Water hyacinth
67	Eleusine compressa	Ghora dhab
68	Emblica officinalis	Anwla
69	Eragrostis tremula	--
70	Erianthus munja	Jhund /Munj
71	Eucalyptus camaldulensis	Safeda
72	Eucalyptus hybrid	Safeda
73	Euphorbia hirta	Dudhi
74	Euphorbia royalaena	Thor
75	Ficus bengalensis	Barh
76	Ficus glomerata	Gullar
77	Ficus religiosa	Peepal
78	Heteropogon contortus	Suva ghas
79	Holoptelca integfifolia	Papri
80	Holoptelea integrifolia	Papri or Rajain
81	Hydrilla verticellata	--
82	Imperata cylindrical	Siru
83	Indigofera oblongifolia	Jhojhru
84	Ipomea cornea	Vilayati aak
85	Iseitma laxum	--
86	jacaranda mimosaefolia	Jacaranda
87	Kigelia pinnata	Kigelia
88	Lasiurus hirsutus	Sevan
89	Leptadenia pyrotechnica	Khimp
90	Leucaena leucocephala	Su-bubul
91	Lnatana camara	Panchphuli
92	Loranthus spp.	--
93	Lycuim barbarum	--
94	Mangifera indica	Aam
95	Melia azedarach	Bakain
96	Melia azederach	Bakain
97	Mimosa charantia	--
98	Mitragyna parvifolia	Phaldu
99	Momordica hamata	Bankarela
100	Moring oleifera	Sohanja
101	Morus alba	Mulberry
102	Nerium odorum	Kaner
103	Ocimum americanum	Jungli Tulsi

S. No	Botanical Name	Hindi Name
104	Opuntia dillenii	Nagphani
105	Panumum antidotale	Ghamor
106	Pardcum turgidum	Gwank
107	Parkinsonia aculeate	Parkinsonia
108	Parthenium spp.	Carrot grass
109	Phonganix sylvestris	Khajur
110	Pitnecolobium dulce	Jangal jalebi
111	Pongamia glabra	Papri
112	Pongamia pinnata	Papri,Karanj
113	Pongamia pinnata	Karanj
114	Portulaca oleracea	--
115	Prosopis cineraia	Jhand
116	Prosopis cineraria	Jand, Jandi
117	Prosopis juliflora	Vilayati Kikar (Mesquite)
118	Ricinus communis	Arand
119	Rumex dentatus	Jungle palak
120	Salvadora oleoides	Jal
121	Sccharum spontaneum	Kans
122	Sehima nervosum	Seran
123	Solanum nigrum	Mako
124	Solanum zanthocarpum	Kateli
125	Sorghum halepense	Baru
126	Sperobolus arabicus	--
127	Sporobotus arundinesea	--
128	Sterculia urens	Gum karaya
129	Syzygium cumini	Jamun
130	Tamarindus indica	Imli
131	Tamarix articulata	Fransh
132	Tamarix dioca	Jhao
133	Tecomella undulata	Rohera
134	Tephrosia puropurea	Jhojhru
135	Terminalia arjuna	Arjun
136	Terminlia arjuna	Arjun
137	Trapa bispinosa	Singhare
138	Trianthema portulacastrum	Santa/Santi
139	Tribulus terrestris	Gokhru
140	Tribulus terrestris	Gokhru
141	Tridax procumbens	Sadahari
142	Triumfetta fomentosa	Kasni
143	Typha elephantine	Patuera
144	Vallaris heyni	--
145	Vallaris solanacea	Dudhi
146	Vetiveria Zizanioides	Panni / Khas
147	Zizyphus mauritiana	Beri
148	Zizyphus mauritiana	Ber
149	Zizyphus mumuloria	Jhari/ Palla /Jharberi
150	Zonthium strumarium	Chirchita

ANNEX- 6.1

2ND STAGE OF DISTRICT LEVEL STAKEHOLDER/PUBLIC CONSULTATION MEETING IN REWARI DISTRICT

1.0 BRIEF DESCRIPTION OF THE STATE -HARYANA

Haryana is one of the most agriculturally developed states of India. It came into being on 1st November, 1966.The state extends over 27^0 39 '00" to 30^0 55'05" North latitudes and 74^0 27'08" to $77^0$36'05" East longitudes. Himachal Pradesh bound it in the north, Uttar Pradesh and Delhi in the east, Rajasthan on its south and southwest and Punjab and Chandigarh on its northwest. Its total geographical area is 44,212 sq km. It comprises 20 districts. Rewari district located in southwest part of the State falls on Western section of the multi-modal high axle dedicated freight corridor project. The brief description of the district is enumerated as under:

1.1 BRIEF DESCRIPTION OF THE DISTRICT-REWARI

Rewari district is located in southwest part of Haryana. It lies between $27^0$58'03' and $28^0$28'20" North latitudes and 76^0 16'52" and 76^0 51'30" East longitudes. It is bounded by Rohtak district in the north, Gurgaon district in the northeast. The state of Rajasthan marks its boundary in the southeast, south and southwest and Rewari district in the west. There are 412 inhabited villages in Rewari district. Its total geographical area is about 1,559 km^2. It is inhabited by about 7, 65,351 persons. The male population of the district is about 40.3, which constitutes about 52% of total population. In contrast, the female population 362317. It accounts for 47% of total population. The population density in the district is 483 persons/km^2. The proportion of scheduled caste population in total population is merely 18.8%. The literacy rate in the district is about 63% (Census of India, 2001).

The district has a sub-tropical continental monsoon climate. The summers are hot and winter season is quite cold in the district. There are two cropping seasons in the district. The major crops grown during the year include wheat, barley, jowar, bajra, toriya, taramira, mustard and cotton.

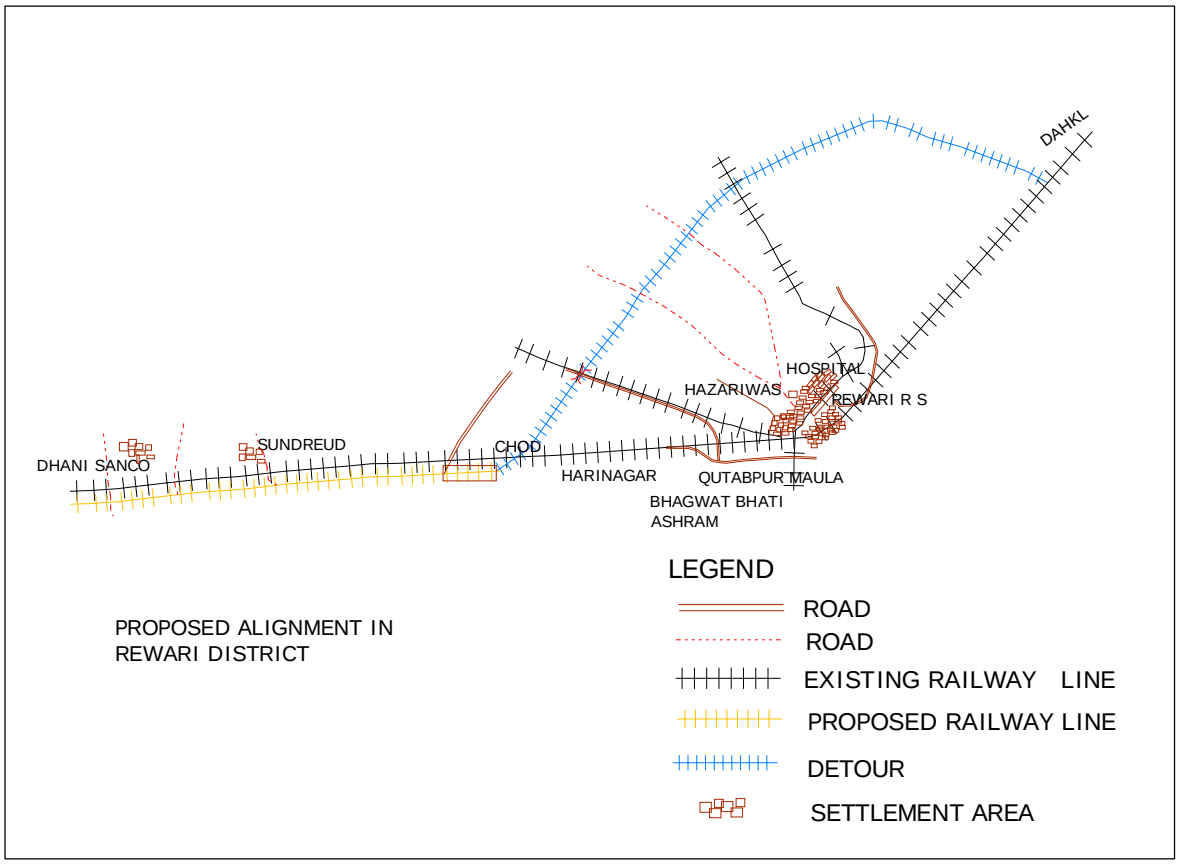
1.2 Brief Description of the DFC Project

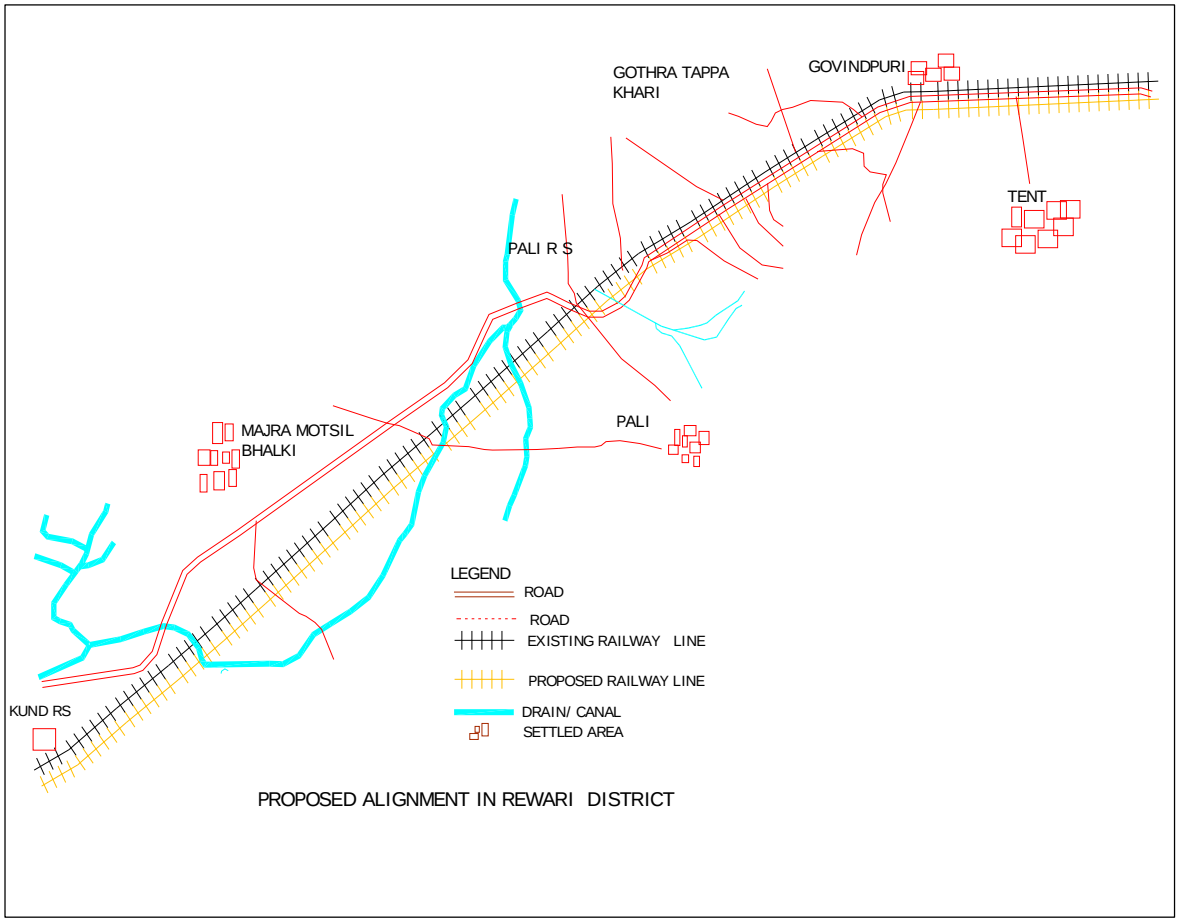
Mministry of Railways, Government of India has planned to develop a dedicated multimodal high axle freight corridor project on eastern and western corridors. This need has been felt due to the growing economy of India requiring improvement in the physical movement of the goods by means of railways within the country. The Japan International Cooperation Agency is undertaking a development study of this dedicated freight corridor project for the Indian Government. Western rout (Mumbai-- Delhi) of dedicated freight corridor will be traversing jawaharlal nehru port trust (jnpt) –Ahmedabad-Palanpur-Rewari-Asaeti-Dadri. down direction of this corridor is considered towards Delhi and up direction towards Jnpt.the proposed alignment passes through the states of maharashtra, gujarat rajasthan, haryana, delhi and uttar pradesh involving thane and raigarh district of maharashtra, valsad, navsari, surat, bharouch, vadodra, anand, khoda, ahemadabad, gandhinagar, mahesana, banas kantha districts of gujarat, sirohi, pali, ajmer, nagaur, jaipur, alwar and sikar districts of rajasthan, mahendragarh (narmaul), rewari, gurgaon and faridabad districts of haryana, south delhi districts of delhi and gautam budh nagar of uttar pradesh.

1.3 Brief Feature of Project in Rewari

1. Total length of DFC corridor in Rewari District is above 32 km including Detour (approximate 32 to 35 km)
2. DFC alignment takes off a new line (short of Pali near Rewari) to bypass the state highway (Rewari to narnaul) and congested area of Rewari city
3. Rewari Junction station is proposed near Thotwal village, in a straight stretch.
4. Thereafter it crosses the Rewari-Bharawas road and the NR Rewari-Alwar main line
5. In Rewari district DFC go along with existing railway line.
6. There are some major and minor railway-road crossing in the district.
7. There are some people likely to be affected in Bhagwat Bhagti Ashram,Pithrawas,Nagil godha,Dharawas,Pithanwas,Raliawas,Nandrampurbas and Bhatsana region.

2.0 Proposed Alignment in Rewari District





PROPOSED ALIGNMENT IN REWARI DISTRICT

2.1 Project Summary Sheet

Title of the Project	Conducting 2nd Stage of District Level Stakeholder/Public Consultation Meeting for Development Study Regarding Dedicated Multimodal High Axle Freight Corridor for Ministry of Railways, Government of India.
Date and Place of Meeting	29th June 2007, Meeting Hall, Room No, 203, Secretariat, Rewari.
Local Consultant	Mantec Consultants Pvt. Ltd., New Delhi.
Local Organizer	Institute for Spatial Planning and Environment Research (ISPER), C-1, Amravati Enclave, P.O. Chandimandir, Tehsil Kalka, District Panchkula, Haryana.
Organizing Place	Rewari, District Rewari
Number of Invitees	About 200 as a letter were also routed through Deputy Commissioner to Invite the Stakeholders, hence difficult to specify the actual figure.
Number of Presence	140
Methods Used for Information Dissemination	Personal Contact Dispatching Invitation Letter Information on Newspaper Information on TV Information Bills at State office Information Bills at District office Information Bills at Panchayat office Announcement by Auto Rickshaw
Stationery Served to the Participants	Handout Writing pad Ball pen Plastic Pen Questionnaire
Methods Adopted for Discussion	Slide Presentation Lecture Group Discussion Question/Answer session
Methods Adopted for Documentation	Still Photography Audio/Video Recording Minutes of Meeting
Media Coverage	TV (Name): Newspaper (Name): 1. Press Correspondent, Dainik Bhaskar (Hindi) 2. Press Correspondent, Punjab Kesari (Hindi) 3. Press Correspondents, Dainik Jagran (Hindi) 4. Press Correspondent, Amar Ujala (Hindi) 5. Press Correspondent, Hari Bhumi (Hindi).

2.2 Selection of Stakeholder (List of Invitees)

Haryana State

1 Deputy Commissioner, Rewari
2 Additional Deputy Commissioner, Rewari
3 District Development and Planning Officer, Rewari
4 District Public Relations Officer (DPRO), Rewari
5 Block Development and Panchayat Officer, Rewari
6 General Managers, Industries, District Rewari.
7 Village Panchayat Sarpanchs, Rewari

- ***Ministry of Railways***

1 Station Master, Rewari

- ***Transport Union Leaders and Traders***

1 Local Transport Union(s)
2 President, Slate Manufacturing Unit, Kund

- ***Media***

1 Press Correspondents, Punjab Kesari (Hindi)
2 Press Correspondents, Dainik Jagran (Hindi)
3 Press Correspondents, Dainik Bhaskar (Hindi)
4 Press Correspondents, Amar Ujala (Hindi)
5 Press Correspondents, Hari Bhumi (Hindi).
6 Local Stakeholder --- Sarpanchs and affected people of the villages

2.3 Method of Selection of Stakeholder

The latest version of JICA Guidelines for Environment and Social Consideration has been developed in 2004 so that JICA funded feasibility study incorporates due consideration of the environmental protection and safeguards the sectors of society directly or indirectly affected by the project. Current feasibility study is carried out applying this guideline

In order to encourage participation of the local residents, Stakeholder/ Public Consultation Meeting is considered as a tool that should play an important role during the project design stage. It is designed to:

- Disclose information on project for open discussion.
- Disseminate information to the lowest possible hierarchy of the social system.
- Obtain interaction of the participants of Stakeholder/Public Consultation Meetings.
- Reflect the valid comments elicited from the open discussions to the design of the project.
- Build a consensus on the project implementation and associated factors.

There are three stages of Stakeholder and Public Consultation Meetings. The first stage of Stakeholder/Public Consultation Meeting is held on state level, followed by second stage of Stakeholder/ Public Consultation Meeting held in the districts, and the third stage of stakeholder/ public consultation meeting is held in the villages directly affected by the project.

Mantec Consultants Pvt. Ltd has already organized first stage of Stakeholder/Public consultation meeting in state of Haryana.

To organize the second stage of Stakeholder/ Public Consultation Meeting Mantec consultants has authorized " 'Institute for Spatial Planning and Environment Research' (ISPER), to meet the concerned government authorities and collect relevant data for carrying forward the social environment study and organize second stage of Stakeholder/Public Consultation Meeting for information dissemination about the project As per direction of the guidelines for conducting the 2nd stage of the Stakeholder/ Public Consultation Meetings a formal order of the Ministry of Railways was got issued vide their letter dated 01-06-07 to facilitate these meetings .

Further, continuous efforts were made to keep the Ministry of Railways involved in the project as the major Stakeholder through their local set-up. Rehabilitation Commissioners were also appointed from the state government departments. Similarly Department of Environment and Forestry and State Pollution Control Boards were contacted to participate in the Meetings. State Government Departments were also apprised and approached and were invited to participate in the Stakeholders/Public Consultation Meetings including the State Public Works Department, Irrigation and Power, Urban Development and Poverty Alleviation Department, industries, telecommunication and Information technology Trade and Commerce, Surface Transport, Tourism, Container/Corporation of India, Port Trusts etc.

Our meeting Facilitator Team visited all the affected villages and requested Primary and Secondary Stakeholders to attend the meeting. Our meeting facilitator team preferred to invite the people who will be affected directly by this project. Our team also met & informed the distt. Administration and requested to help in organizing the public meeting successfully. Local stakeholders along the railway line, affected farmers, businessmen, private service and Govt. service employees were invited in the meeting. Our study team also contacted Tehsildars of affected Tehsils, Panchayat Samiti Pramukhs, Gram Pradhan, and local MLA and requested them to attend the meeting and also gave necessary support in conducting second stage of Stakeholder/Public Consultation Meeting. The main objective of the second stage of Stakeholder/Public Consultation Meeting is to disseminate the general information to public. In the State of Haryana two districts will be affected by this DFC project Not only that our meeting facilitator team visited all the affected villages and requested primary and secondary Stakeholder to attend the meeting. Saterified random sampling method was used for the selection of Stakeholders because limited people had to be invited. Our meeting facilitator team also took consideration while extending invitations that vulnerable group of affected area should definitely be present in the meeting.

Stakeholders /Public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project. The second public consultation meeting for Rewari district of Haryana state was conducted at Secretariat, Rewari on 29-06-2007 under the chairmanship of Deputy Commissioner Rewari. Other dignitaries participating in the meeting were Additional Deputy Commissioner, District Development and Panchayat Officer (DDPO), District Public Relations Officer (DPRO), local industrialists, traders and educationists and other district level officials.

It is noted here that the total freight rail line is about 28 km in Rewari district of Haryana. Out of this 28 km about 8.41 km is diversion line and remaining 20 km rail freight link will be constructed along the existing railway line. As per the existing norms, about 26m and 20m strip of land will be occupied in diversion line and along the existing rail link respectively. The project-affected families would be properly compensated, rehabilitated and resettled as per the National Rehabilitation Policy, 2006. Although, this freight rail line will pass through many villages. However, the severely affected villages in the district include Dohki, Gokulgarh, uwas, Chandawas, Saharanwas, Kharagwas (on diversion line) and Kund village along the existing railline.

2.4 Selection of Meeting Facilitator

Simultaneously extensive surveys were conducted for the identification of suitable local agencies for the successful organization of the second stage of Stakeholders/Public Consultation Meetings.

Preference was given to appoint Non Government Organizations (NGO) who had local presence, popularity and experience of social and public works. It has to be well acquainted with multifarious cross section of society to help in the selection of the right type of Stakeholders for the meetings as well as for facilitating other related activities. i. e.

- Venue for the meetings
- Arrangement to be made
- Assisting in local publicity
- Invitation to the Stakeholders and motivating them for participation
- Maintaining and compilation of record and feed back and
- Other local arrangements like transport, hospitality, security and smooth conduct of the meeting proceedings.

The NGO 'Institute for Spatial Planning and Environment Research' was appointed for facilitating the second stage of Stakeholder and Public Consultation meeting, socio-economic survey and village level meeting

2.5 Method of Information Dissemination

A. Method of Notifying the Meeting to the Participants

Our organization sought the help of government machinery for inviting the project-affected families. An official letter was routed through Deputy Commissioner to District Development and Panchayat officer (DDPO) to invite the entire affected village Panchayat Sarpanchs of Rewari to participate in the meeting. The same notification was also issued to General Manager, Industries to participate the meeting and propose their suggestions.

Besides Meeting Facilitator team visited all the villages located along the existing railway line in the district and briefed up about this freight rail link to the villagers and role of Public consultation meeting in the execution of this project. Meeting facilitator team also disseminated the reports of the first public consultation meeting held at Saha in Ambala district among the villagers.

Our team also made a close correspondence with local media personnel and disseminated a lot of information about the Stakeholders/ Public Consultation Meeting before and after the meeting. The copies of media reports are enclosed with the report. Our team also displayed banners and relevant handouts showing major features of the project and DFC alignment passing through the Rewari district.

2.6 Venue of the Stakeholder/ Public Consultation Meeting

29th June 2007, Meeting Hall, Room No, 203, Secretariat, Rewari.

3.0 Participants of Stakeholder/ Public Consultation Meeting

LIST OF PARTICIPANTS

Haryana State

1 Deputy Commissioner, Rewari
2 Additional Deputy Commissioners, Rewari
3 District Developments and Planning Officer, Rewari
4 District Public Relation Officers (DPRO), Rewari
5 Block Development and Panchayat Officer, Rewari
6 General Managers, Industries, District Rewari.
7 Village Panchayat Sarpanchs, Rewari
8 Representatives (three persons) of JICA Study Team

3.1 Details of Stakeholder and Public Consultation Meeting

(1) Minutes of the Meeting

The public consultation meeting started at the scheduled time. The minutes of the meeting are detailed out as follows:

11.00 A.M to 11.10 A.M. The public consultation meeting started at 11.00 A.M. Deputy Commissioner came at 11.00 P.M. The organizers of meeting showed proposed freight rail alignment and list of affected villages displayed outside the meeting hall to the Deputy Commissioner and other dignitaries. The Deputy Commissioner inaugurated the stakeholders meeting.

11.10 A.M. to 11.30 A.M. The meeting facilitator made a welcome address and briefed the theme to the participants. He introduced Mantec representatives and JICA Study Team representatives to the chief guest and other participants.

11.30 A.M. to 12 Noon General Manager, Mantec Consultants made his presentation on the objectives and features of dedicated freight corridor project. He dwelled upon each component of the DFC. Participants shown keen interest in the presentation.

12.01 P.M. to 12.10 P.M. Deputy Commissioner, Rewari in his presidential remarks informed the public that DFC project has many dimensions and likely to generate better employment opportunities both at the regional and national level. He also informed the public that local people

would harness best benefits if some cargo handling yards and a freight rail station is opened at Atelli Mandi or Narnaul.

12.10 P.M. to 12.40 P.M. During the interactive session a lot of discussion took place among the primary stakeholders, administrators, local politicians, traders, educationists, media persons and organizers of the meeting. The questions/answers and suggestions are recorded separately

12.40 P.M to 1.20 P.M. A press conference was organized and local press reporters sought information about the project.

1.20 P.M. to.1.30 P.M. The meeting ended with vote of thanks to the chair

3.2 Profile Dissipation of Participants

The major observations of stakeholders/public consultation meeting held at Rewari on 29-06-2007 recorded through questionnaires are as follows

Table 1.1 Distribution of Respondents by Village

Sl. No.	Name of Village	Total Respondents
1	Aliwas	1(0.90)
2	Bareli Khurd	1(0.90)
3	Baldhan Kalan	2(1.80)
4	Bharawas	4(3.60)
5	Chandawas	15(13.51)
6	Choki No.2	1(0.90)
7	Chita dingra	2(1.80)
8	Daruhera	1(0.90)
9	Dohki	19(17.12)
10	Gokulgarh	13(11.71)
11	Hasirpur	1(0.90)
12	Jarthal	3(2.70)
13	Kharagwas	10(9.00)
14	Kaluwas	1(0.90)
15	Kanhodwas	2(1.80)
16	Kund	2(1.80)
17	Lisana	1(0.90)
18	Ladhana	9(8.11)
19	Lalpura	2(1.80)
20	Malahera	1(0.90)
21	Mohalakhurd	2(1.80)
22	Nangal	2(1.80)
23	Omnath	1(0.90)
24	Pitharawas	5(4.50)
25	Pithanwas	5(4.50)
26	Raghunathpur	1(0.90)
27	Raliawas	1(0.90)
28	Saharanwas	3(2.70)
	Total	**111**

Figures in Parentheses show the Percentage to Total Respondents

Table 1.1 brings out the distribution of respondents by their village. It is observed that that there were one hundred and eleven respondents, natives of twenty eight villages, participating in the public consultation meeting on dedicated freight corridor project. It indicates the wider geographical representation of village Sarpanchs and other stakeholders. The Dohki, Chandawas, Gokulgarh villages have shown keen interest in forwarding their opinions. The representation of these villages has been witnessed above one-tenth of total respondents. It is noted here that ISPER study team while visiting the project affected families in detour area has also received information in this regard and has been duly incorporated here to reflect the public opinion of target group. It is observed here that those who are not likely to be affected by the dedicated freight corridor project also attended public consultation meeting.

Table 1.2 Distribution of Participants by Caste

Scheduled Caste	Other Backward Class	General	Total
4(3.60)	83(74.78)	24(21.62)	111(100.00)

Figures in parentheses show the percentage to total respondents

There are no scheduled tribes in Haryana state as per Census of India. The participation of other backward castes has been the highest i.e. 74.8%. The Table shows that little more than one-fifth of the respondents were from general category. Hence, the public consultation meeting was attended by overwhelmingly majority of other backward castes. The Table exhibits that that the representation of scheduled castes has been very low in the public consultation meeting.

Table 1.3 Distribution of Participants by Family Size

Less than 4	Less than 6	More than 6	Total
1(0.90)	45(40.54)	65(58.56)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.3 brings out that the family size varies from less than four persons to more than six persons in Rewari district. The respondents having small family size i.e. less than 4 persons have negligible participation. The respondents having moderate (i.e. less than 6 persons) family size have witnessed moderate participation, which constitutes about 40 per cent of total respondents. Whereas those having large family size i.e. more than 6 persons shown about 58 per cent of participation.

Table 1.4 Distribution of Participants by Origin and Numeric Strength

Native	Non-Native/Migrated	Total	Majority	Minority	Total
111(100)	NIL	111(100.00)	83(74.78)	28(25.22)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.4 points out that all of the respondents are original inhabitants of the region. About three –fourth of the respondents stated that they are found in majority in their area of origin. Whereas, about one-fourth of the respondents feel that they are in minority as their villages are dominated by other castes.

Table 1.5 Distribution of Participants by Literacy Status

Literate	Illiterate	Total
106(95.50)	5(4.50)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.5 indicates that overwhelming majority of the people participating in the public consultation meeting were literate. It is evident from the fact that about 95 per cent of total respondents were literate. The highest literacy among the participants may be attributed to old educational institutions available in the region.

Table 1.6 Distribution of Participants by Level of Education

Under Matric	Matric	Graduate	Other Professional Qualification	Total
28(25.23)	60(54.06)	15(13.51)	8(7.20)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.6 shows the distribution of participants by level of educational attainments. The level of educational attainment could be taken as an indicator of social development of any region. The study points out that the proportion of respondents at the below matriculation level has been only one-fourth of total. The highest proportions (54.1%) of respondents have reported their academic qualification as matriculation. The analysis shows that as the educational level increases the proportion of the respondent's decreases. It is evident from the fact that only 13.5% of the total respondents have enumerated as graduates. It is ascribed to the developing economy of the region as evident from Table 1.7. It is noted that merely seven percent of total respondents have enumerated as trained in vocational and other professional courses. It shows that public consultation meeting has participated by aware and educated people of the district.

Table 1.7 Distribution of Participants by Occupation

Agriculture	Private Service	Govt. Service	Business	Total
92(82.89)	8(7.20)	7(6.31)	4(3.60)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.7 depicts that agriculture is still the main occupation of overwhelmingly majority of the population in Rewari district. The statistics indicates that more than 80% of are engaged in primary activities particularly in agriculture. The engagement of participants in business activities is insignificant i.e. below 5% in the area. The proportion of the respondents earning their livelihood from services both government and job together is minimum (13.5%) in the area.

Table 1.8 Distribution of Participants by Level of Yearly Income (Rs)

Less Than 25,000	25,000 –50,000	50,000 -100,000	100,000 and Above	Total
40(36.04)	28(25.22)	25(22.52)	18(16.22)	111(100.00)

Figures in parentheses show the percentage to total respondents

Table 1.8 shows the distribution of participants by level of annual household income. Considering the range of income of the respondents, the entire population has been divided into four categories. The data reveals that the level of annual household income varies from less than rupees 25,000 to more than rupees 100,000 in the region. The highest proportion of the participants falling less than rupees 25,000 category is about 36%. The percentage of participants having annual household income between rupees 25,000 to 50,000 and 50,000 to 100,000 is 25%

and 22% respectively. The proportion of households earning more than one lac in a year is merely 16%.

Table 1.9 Distribution of Respondents by Location

ROW	Diversion Line	ROB	RUB	East of Rewari	Away from the Proposed Track	Total
Nil	62(55.86)	Nil	Nil	36(32.43)	13(11.71)	111(100.00)

The above Table brings out that about 56% participants have their agricultural land and settlements on and along the proposed diversion line. It is noted here that in order to have minimum loss to Rewari city about 8 km detour is proposed in Rewari district. It is noted that row of way (ROW) has also not been occupied illegally by the squatters or migrants and local villagers as well. About one-third of the respondents participating the public consultation meeting have their residences east of the Rewari city. About one-tenth of the respondents stated the location of their settlements and other physical property away from the proposed freight rail link.

Table 1.10 Distribution of Participants by Impact

Significant	Relatively Significant	Insignificant	Negligible	Total
Nil	16(14.41)	19(17.12)	76(68.47)	111(100.00)

Table 1.10 reveals the distribution of respondents by impact of dedicated freight corridor project on their lives. Interestingly, the proportion of respondents feeling that DFC project will cause significant impact is nil in Rewari district. About 16 per cent of the respondents feel that dedicated freight corridor project will exercise relatively significant impact on them. The significance level has been assessed in terms of the guidelines given in questionnaires. About 17% participants are likely to experience insignificant impacts due to this project. More than two-third of participants stated negligible impact on their livelihood in the district.

Table 1.11 Distribution of Respondents by Type of Impact

Loss of land	Both Land and Occupation	Loss of Livelihood	No Impact	Total
37(33.33)	25(22.52)	30(27.02)	49(44.15)	111(100.00)

Table 1.11 points out that about one-third participants are likely to loose their agricultural land and land put to non agricultural uses which include courtyard, open cattle sheds etc. Hence, the most important impact of this project is loss of land in the Rewari district. Little more than one fifth of participants feel that they will face loss of both land and occupation due to the proposed diversion line. About 27% of the respondents will have negative impact on their livelihood. Majority (44%) of the respondents participating in the meeting feel that the proposed project has no impact on them. It may be attributed to the fact that about 40% of the participants owe their origin to other geographical location of the district away from the detour and remaining alignment along the existing railline. It is investigated that the proposed DFC is likely to exercise negative impacts on land, occupation and sources of livelihoods.

Table 1.12 Distributions of Respondents by Compensation Desired

Land	Cash	House	Not Affected	Total
68(61.26)	29(26.13)	Nil	40(36.04)	111(100.00)

Table 1.12 indicates that 61.3% of total participants want only land if their own land is acquired under DFC project. Only 26% of respondents expressed that they should be compensated with cash. The proportion of participants willing to get house(s) is nil. The proportion of participants who have not any kind of repercussions from the proposed dedicated freight corridor is 36%.

MAJOR SUGGESTIONS

Table 1.13 Percentage of Participants by Suggestions

Sl. No.	Total Participants (%)
A	50(45.05)
B	7(6.30)
C	9(8.11)
D	6(5.41)
E	6(5.41)
F	5(4.50)
G	9(8.11)
H	12(10.81)
I	7(6.30)
Total	**111(100.00)**

A Rail Bridge and Crossing Gate
B Control on Vibration and Noise Pollution
C Proper Safety Measures
D Provision of Container Depot
E Provision of Cross Drainage
F Good Project to Public
G Employment to One Family Member
H Comments Declined and I Others.

The above table exhibits the distribution of respondents by suggestions. In this context, the first suggestion has been considered as the most important suggestion. Accordingly, nine categories of suggestions have been made. It is evident from the analysis that majority (45%) of the stakeholders/ project affected families (PAFs) want that crossing gates and bridges must be constructed near their settlements. This suggestion has largely emerged from the participants having their residences in detour area. Only 6 per cent participants feel that high-speed freight trains could enhance vibration and noise pollution in the area hence there should be proper arrangement of vibration and noise controlling measures. About 8 per cent of the respondents stated that proper safety measures must be provided to the villagers, as there are chances of accidents of animals and human beings particularly children. The proportion of participants supporting the provision of container depot and proper cross drainage is same i.e. 5.4%. About 8% of the participants suggested that Government of India must employ at least one person of each affected family in the Railways department. The proportion of participants falling in others category is merely 6.3%. Others category include provision of freight rail station, project be implemented as per government policy, least impact on irrigation conveyance system, track should pass at least one km away from settlements and provision of green belt along the track.

3.3 Question /Answer Session

During the interactive session of the public consultation meeting a lot of discussion took place among stakeholders, administrators, local politicians, transport union leaders, media persons and organizers of the meeting. The major issues that emerged during the public consultation meeting regarding Dedicated Freight Corridor (DFC) together are described as under:

Question 1 Participant from Dohki "Why you circulate wrong alignment, when you have not details knowledge about it"?

Answer 1 Manrec Representative "I am extremely sorry that due to some misunderstanding our meeting facilitator team circulated wrong alignment. Right now I am going to clear the right alignment and detour route of Rewari and all misunderstanding created by the circulation of wrong alignment".

Question 2 Representative of Hero Honda Industries "Sir right now I have some clear idea about the alignment and detour route. Sir, a depo should be made in industrial area of Rewari so that local industrial and other agro-based products could be transported with efficiency and minimum transport cost?

Answer 2 Manrec Representative "Your suggestion is very good and I will mention it in the final report. As you know that it is feasibility study and after this study the final picture will come out".

Question 3 Participant from Dohki "What kind of compensation would be paid to the land owners, will it be according to the market cost or govt. rates?"

Answer 3 Manrec Representative "The compensation shall be made as per National Rehabilitation Policy of 2006 of Government of India.".

Question 4 Participant from Dharuhera "How many villages will be affected by this project?

Answer 4 Mantec Representative "people of four villages will be directly affected by this project in Rewari district.

In the Rewari PCM participants instead of asking question gave their suggestions.

SUGGESTION

Deputy Commissioner, IAS in his expert remarks informed the representatives of JICA Study Team, Consultants, organizers of the public consultation meeting (ISPER, a local NGO) and local public that this freight corridor project has many dimensions and involves many intricacies in its execution. He suggested that there should be minimum loss to the local public and this freight rail link should pass at least 0.5-1 km away from human settlements in detour area.

In his suggestion he proposed that Rewari due to nearness to National capital, Delhi is a growing industrial township and has industrial towns like Bawal of International repute. Hence, while laying the proposed DFC rail link, its local industrial strengths must be considered and harnessed. It would be better if a freight rail station and cargo handling yards are provided in Rewari district. He also dwelled upon the proper study of risk factors like existing gas pipeline laid down in detour area of the district.

A male participant from Dohki “Land compensation would be paid according market price. Because in Rewari the land rate has risen many fold here due to proximity with Delhi.

A male participant from Lodhana **“**a railway station should be constructed here so that people of Rewari will get benefit from that project.

3.4 Summary of Major Findings

About one hundred and eleven respondents of twenty-eight villages participated in the public consultation meeting. The representation of public has almost same with little variations ranging between 1 person and highest 19 persons in the whole villages. The Dohki village has shown the highest participation. . The representation of Schedule Castes has been very low in the Public Consultation Meeting. The Public Consultation was attended by overwhelmingly majority of other Backward Castes. The respondents having large (i.e. more than 6 persons) family size have registered highest (58.6%) participation in the meeting. The analysis reveals that all the respondents are original inhabitants. The meeting was participated by literate persons as more than 95% of respondents were enumerated as literates. The highest proportions (54.1%) of respondents participating in the meeting have observed matriculates. The participation of graduates has observed 13.5% 0f total respondents.

It is discovered that more than 82% of respondents are engaged in agriculture. Despite the higher participation in the agricultural activities the level of annual household income is quite high in the region as per Indian standards. It is investigated that about 90% participants are not satisfied with the existing railways facilities for the physical movement of goods. It is gratifying to note that that 85% of respondents are in favour of this multi modal dedicated freight corridor.

All participants are in agreement to leave their land and property to fulfill the requirement of DFC project. They also said that Govt. should provide them appropriate compensation.

3.5 Newspaper Cutting

गुड़गांव/3

रेलवे ट्रैक के लिए 5 गांवों की जमीन अधिगृहीत होगी

रेवाड़ी, 29 जून (अस)। मुंबई से दिल्ली के लिए मालवाहक रेल परिवहन ट्रैक तैयार करने के लिए वेस्टर्न फ्रेट कोरिडॉर के तहत जिला रेवाड़ी से 35 किलोमीटर लंबा रेल ट्रैक गुजरेगा।

इस ट्रैक को तैयार करने के लिए संबंधित भू-स्वामियों की जमीन अधिग्रहण करने को लेकर तथा उनके सुझाव व समस्याओं को जानने के लिए आज जिला सचिवालय के सभागार में एक बैठक का आयोजन किया गया, जिसमें प्रभावित ग्रामीणों व गणमान्य लोगों ने भाग लिया।

बैठक में जिला उपायुक्त चंद्रप्रकाश, एडीसी डा. एसएस दलाल व इस प्रोजेक्ट का सर्वे कर रही एक स्वयं सेवी संस्था स्थानीय नियोजन एवं पर्यावरण शोध संस्थान पंचकूला के एसोसिएट डायरेक्टर (रिसर्च) बीआर ठाकुर व उनकी टीम उपस्थित थी। जिन गांवों से यह रेल ट्रैक गुजरेगा, उनके किसान आज चिंतित दिखाई दिए। गांव ढोहकी, चांदावास, गोकलगढ़, हरिनगर व कालूवास के किसानों के खेतों की जमीन ट्रैक हेतु अधिगृहित होने वाली है। इनके खेतों से ट्रैक के लिए 20 व 26 मीटर चौड़ी भूमि ली जाएगी।

ANNEX 6.2

3RD STAGE OF VILLAGELEVEL STAKEHOLDER/PUBLIC CONSULTATION MEETING IN REWARI DISTRICT

Project Summary Sheet

Project Summary Sheet	
Title of the Project	Conducting 3rd stage of Village Level Stakeholder/Public Consultation Meeting for development Study Regarding Dedicated Multimodal High Axle Freight Corridor for Ministry of Railways, Government of India.
Date and Place of Meeting	08-07-2007, Meeting Hall, Room No, 203, Secretariat, Rewari
Local Consultant	Mantec Consultants Pvt. Ltd. New Delhi.
Local Organizer	'Institute for Spatial Planning and Environment Research' (ISPER), C-1, Amravati Enclave, P.O. Chandimandir, Tehsil Kalka, District Panchkula, Haryana.
Organizing Place	Rewari
Number of Invitees	About 500. It is noted here that ISPER study team during village level meetings had also personally invited the village Sarpanchs, Panchs and other project affected persons to attend the scheduled meeting. Besides a letter was also routed through Deputy Commissioner to invite the Village Panchayat officials and other project affected families.
Number of Presence	80
Methods Used for Information Dissemination	Personal Contact
	Dispatching Invitation Letter
	Information on Newspaper
	Information on TV
	Information Bills at State office
	Information Bills at District office
	Information Bills at Panchayat office
	Announcement by Auto Rickshaw
	Others (Through Telephones)
Stationery Served to the Participants	Handout
	Writing pad
	Ball pen
	Questionnaire
Methods Adopted for Discussion	Slide Presentation
	Lecture
	Group Discussion
	Question/Answer session
Methods Adopted for Documentation	Still Photography
	Audio/Video Recording
	Minutes of Meeting
Media Coverage	TV: (Name):
	Newspaper (Name):
	1. Press Correspondent, Dainik Bhaskar (Hindi)
	2. Press Correspondent, Punjab Kesari (Hindi)
	3. Press Correspondents, Dainik Jagran (Hindi)
	4. Press Correspondent, Amar Ujala (Hindi)
	5. Press Correspondent, Hari Bhumi (Hindi).

1.Selection of Stakeholder (List of Invitees)

(1) HARYANA STATE

1) Deputy Commissioner, Rewari
2) Additional Deputy Commissioner, Rewari
3) District Development and Planning Officer, Rewari
4) Block Development and Panchayat Officer, Rewari
5) General Managers, Industries, District Rewari.
6) Village Panchayat Sarpanchs of all Project Affected Villages , Rewari

(2) Ministry of Railways

1 Station Master, Rewari
2 Station Staff

(3) Media Persons

1 Press Reporter, Punjab Kesari (Hindi)
2 Press Reporter, Dainik Jagran (Hindi)
3 Press Reporter, Dainik Bhaskar (Hindi)
4 Press Reporter, Amar Ujala (Hindi)
5 Press Reporter, Hari Bhumi (Hindi).

2. Method of Selection of Stakeholders

The latest version of JICA Guidelines for Environment and Social Consideration has been developed in 2004 so that JICA funded feasibility study incorporates due consideration of the environmental protection and safeguards of different sectors of society directly or indirectly affected by the project. Current feasibility study is carried out applying this guideline.

In order to encourage participation of the local residents, Stakeholder/ Public Consultation Meeting is considered as a tool that should play an important role during the project design stage. It is designed to

- Disclose information on project for open discussion.
- Disseminate information to the lowest possible hierarchy of the social system.
- Obtain interaction of the participants of Stakeholder/Public Consultation Meetings.
- Reflect the valid comments elicited from the open discussions to the design of the project.
- Build a consensus on the project implementation and associated factors.

There are three stages of Stakeholder and Public Consultation Meetings. The first stage of Stakeholder/Public Consultation Meeting has held on state level, followed by second stage of Stakeholder/ Public Consultation Meeting held at the district level and the third stage of stakeholder/ public consultation meeting is held in the villages directly affected by the project.

Institute for Spatial Planning and Environment Research (ISPER) in consultation with Mantec Consultants Pvt. Ltd has already organized first stage of Stakeholder/Public Consultation Meeting in the state of Haryana.

To organize the second and third stage of Stakeholder/ Public Consultation Meeting Mantec consultants has also authorized " 'Institute for Spatial Planning and Environment Research' (ISPER), to meet the concerned government authorities and collect relevant data for carrying forward the social environment study and organize second and third stage of Stakeholder/Public Consultation Meeting for information dissemination about the project. As per directions of the guidelines for conducting the 2nd stage of the Stakeholder/ Public Consultation

Meetings a formal order of the Ministry of Railways was issued vide their letter dated 01-06-07 to facilitate these meetings.

Further, continuous efforts were made to keep the Ministry of Railways involved in the project as the major stakeholder through their local set-up. Rehabilitation Commissioners were also appointed from the state government departments. State Government Departments were also apprised and approached and were invited to participate in the Stakeholders/Public Consultation Meetings.

ISPER meeting facilitator team visited all the affected villages and requested Primary and Secondary Stakeholders to attend the meeting. Our meeting facilitator team preferred to invite the people who are likely to be affected directly by this project. Our team also met and informed the district administration and requested to help in organizing the public meeting successfully. Local stakeholders along the railway line, affected farmers, businessmen, private service and Govt. service employees were invited in the meeting. Our study team also contacted Panchayat Samiti Pramukhs, Gram Pradhan, and project affected persons and requested them to attend the meeting and also gave necessary support in conducting third stage of Stakeholder/Public Consultation Meeting. The main objective of the third stage of Stakeholder/Public Consultation Meeting is to disseminate the general information to public of the project affected villages. In Haryana State two districts are being affected by the proposed dedicated freight corridor project. Not only that our meeting facilitator team visited all the affected villages and requested primary and secondary Stakeholder to attend the meeting. Stratified random sampling method was also used for the selection of Stakeholders because limited people had to be invited. Our meeting facilitator team also took consideration while extending invitations that vulnerable group of affected area should definitely be present in the meeting.

Stakeholders /Public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project. The third public consultation meeting for Rewari district of Haryana state was conducted at Meeting Hall, Room No, 203, Secretariat, Rewari on 08-07-2007 under the chairmanship of Deputy Commissioner, Sh Chander Prakash (IAS), Rewari. Other dignitaries participating in the meeting were Additional Deputy Commissioner, District Development and Planning Officer (DDPO), Village Panchayat Sarpanchs, traders and educationists and other district level officials.

It is noted here that the total freight rail line is about 28 km in Rewari district of Haryana. Out of this 28 km about 8.41 km is diversion line and remaining 20 km rail freight link will be constructed along the existing railway line. As per the existing norms, about 45m and 24m strip of land will be occupied in diversion line and along the existing rail link respectively. The project-affected families (PAFs) would be properly compensated, rehabilitated and resettled as per the National Rehabilitation Policy, 2006. Although, this freight rail line will pass through many villages as shown in fig.1. However, the severely affected villages in the district are given further in the present report.

3. Selection of Meeting Facilitator

Simultaneously extensive surveys were conducted for the identification of suitable local agencies for the successful organization of the third stage of Stakeholders/Public Consultation Meetings. Preference was given to appoint Non Government Organizations (NGO) who had local presence, popularity and experience of social and public works. It has to be well acquainted with multifarious cross section of society to help in the selection of the right type of stakeholders for the meetings as well as for facilitating other related activities. i.e.

- Venue for the meetings
- Arrangement to be made;

- Assisting in local publicity;
- Invitation to the Stakeholders and motivating them for participation;
- Maintaining and compilation of record and feed back; and
- Other local arrangements like transport, hospitality, security and smooth conduct of the meeting proceedings.

The NGO **'Institute for Spatial Planning and Environment Research, India'** was appointed for facilitating the third stage of Stakeholder and Public Consultation meeting, socio-economic survey and village level meeting.

4. Method of Information Dissemination

➢ **i) Method of Notifying the Meeting to the Participants**

There were three methods adopted for informing the participants about 3rd public consultation meeting. In the First method our Team fixed the meetings at a particular venue with all the Village Sarpanchs of project affected villages. Village Sarpanchs were also requested to inform other likely to be affected persons and attend the meetings. ISPER team announced the date and venue of 3rd public consultation meeting in all such villages gatherings congregated in project affected villages. Hence, meeting facilitator team visited all the villages located along the existing railway line in the district and briefed up about this freight rail link to the villagers and role of Public consultation meeting in the execution of this project. Meeting facilitator team also disseminated the reports of the second public consultation meeting held at Meeting Hall, Room No, 203, Secretariat, Rewari.

In second attempt, our organization also sought the help of government machinery for inviting the project-affected families of all project affected villages. An official letter was routed through Deputy Commissioner to District Development and Panchayat officer (DDPO) to invite the village Panchayat Sarpanchs of all project affected villages to participate in the meeting. The same notification was also issued to General Manager, Industries and other stakeholders to participate the meeting and propose their suggestions.

In third attempt, our team also made a close correspondence with local media personnel and disseminated a lot of information about the relevance of stakeholders meetings. Our team also displayed banners and relevant handouts showing major features of the project and DFC alignment passing through the Rewari district.

ii) Presentation of the Meeting

Presentation of meeting material supplied by Mantec Consultants was displayed and distributed among the stakeholders.

5. Venue of Stakeholder/ Public Consultation Meeting

Meeting Hall, Room No, 203, Secretariat, Rewari.

6. Participants of Stakeholder/Public Consultation Meeting

A) List of Participants
Haryana State and Outside

1) Deputy Commissioner, Rewari
2) Additional Deputy Commissioner, Rewari
3) District Development and Panchayat Officer, Rewari
4) Block Development and Panchayat Officer, Rewari
5) General Managers, Industries, District Rewari.
6) Shusuke Minato, Public Consultation Expert (JICA Representative).

7) Sanjeev Sharma, General Manager, Mantec Consultants, New Delhi
8) Project Affected Villages Panchayat Sarpanchs, Rewari (List Enclosed as under).

7 Details of Stakeholder/ Public Consultation Meeting

Stakeholders /public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project.

8. Minutes of the Meeting

The public consultation meeting started at the scheduled time. The minutes of the meeting are enumerated as under:

10.40 A.M to 10.50 A.M.

Although the project affected persons had started reaching at the venue sharp at 10.00a.m.The chairman of the 3rd Public consultation Meeting arrived at 10.40 A.M. Hence, the public consultation meeting started at 10.40 A.M. with the arrival and kind permission of Deputy Commissioner, IAS. The organizers of meeting showed proposed freight rail alignment and list of affected villages displayed outside the meeting hall to the Deputy Commissioner and other dignitaries.

10.50 A.M. to 12.05 P.M.

Meeting Facilitator leader made a welcome address and briefed the theme to the participants and primary stakeholders. He also introduced public consultation expert, one of the representatives of JICA study team and representative of Mantec Consultants to the chief guest and other participants.

12.05 P.M. to 12.40 P.M.

General Manager, Mantec Consultants made his presentation on the objectives and features of dedicated freight corridor project. He showed the alignment of proposed dedicated freight railway line through drawings. He dwelled upon each component of the DFC. Participants shown keen interest in the presentation.

12.40 P.M. to 1.00 P.M.

Public Consultation Expert of JICA study team also displayed some drawings relating to the proposed diversion line in Rewari and assured the participants that the proposed DFC will pass through outside the controlled area envisioned in Master Plan of Rewari.

1.0P.M. to 1.05P.M.

District Development and Panchayat Officer, Rewari in his presidential remarks informed the public that DFC project has many dimensions and likely to generate better employment opportunities both at the regional and national level. On the issue raised by one of the participants that proposed DFC is falling in Rewari Master Plan Area he assured the public that matter would be cared of.

Interactive Session:

There has not been any specified duration of interactive session. It has been continued during and after the presentation made by the representative of Mantec. During the interactive session, a lot of discussion took place among the primary stakeholders, administrators, local politicians,

traders, educationists, media persons and organizers of the meeting. The questions/answers and suggestions are recorded separately.

1.05 P.M. to.1.10 P.M.

The meeting ended with vote of thanks to the chair.

9. Press Conference:

After the meeting ISPER team and representative of Mantec Consultants were invited by Additional Deputy Commissioner, to interact with media persons and District Revenue Officer, Rewari. The brief of the project was again discussed there with Additional Deputy Commissioner, Revenue Officer and Media persons.

10. Profile Description of Participants

The major observations of Stakeholders/Public consultation meeting held at Rewari on 08-07-2007 recorded through questionnaires are as follows:

Table 1 Distribution of Respondents by Village

Sr. No	Name of Village	Total Respondents
1	Bhisana	1(1.85)
2	Chandawas	6(11.11)
3	Dadala	1(1.85)
4	Dhoki	9(16.66)
5	Gokalgarh	10(18.51)
6	Jharajwas	1(1.85)
7	Kaluwas	5(9.30)
8	Katarpur	2(3.70)
9	Kund	1(1.85)
10	Lishana	13(24.07)
11	Rasana	1(1.85)
12	Saharanwas	2(3.70)
13	Shadipur	2(3.70)
Total		**54**(100.00)

Figures in parentheses show the percentage to total respondents

Table 1 reveals that there were fifty four respondents, natives of thirteen villages, participating in the public consultation meeting on dedicated freight corridor project. It indicates the wider representation of village Sarpanchs and other invitees. The Lisana village has shown the highest representation, which accounts almost one forth (24.07%) of total participants. The Gokulgarh village has shown around one fifth (18.51 %) of total participants. The Dhoki and Chandawas, which are likely to be affected, have also shown considerable participation in the meeting. Interestingly, other than this there are also respondents from 9 more villages who have showed their active participation in the third public consultation meeting.

Table 2 Distribution of Participants by Caste

Scheduled Caste	Other Backward Class	General	Total Respondents
3(5.55)	26(48.15)	25(46.30)	54(100.00)

Figures in parentheses show the percentage to total respondents

There are no scheduled tribes in Haryana state as per Census of India. The representation of Other Backward castes was the highest i.e. 26(48.15%). The data show that nearly half participants were from general category. The study reveals that the representation of scheduled castes has been very low (5.55%) in the public consultation meeting.

Table 3 Distribution of Participants by Family Size

Less Than 4	Less Than 6	More Than 6	Total Respondents
10(18.52)	17(31.48)	27(50.00)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 3 brings out that the family size varies from less than four persons to more than six persons in Rewari district. The respondents having small family size i.e. less than 4 persons have nearly one fifth of participation. The respondents having moderate (i.e. less than 6 persons) family size have witnessed moderate participation that constitutes about one-third of total respondents. Participants having large family size i.e. more than 6 persons have shown the maximum percentage i.e. 61.77 per cent of participation.

Table 4 Distribution of Participants by Origin and Numeric Strength

Native	Non-Native/Migrated	Total	Majority	Minority	Total Respondents
52(96.30)	2(3.70)	54(100)	26(48.15)	28(51.85)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 4 reveals that 96.30 per cent of the respondents are original inhabitants of the region while 3.70 per cent is non-native/migrated from other place. It is also evident that little less than half of the respondents stated the majority of their caste/community in different villages of the district Rewari whereas, slight more than half of the participants owe their origin to the minority segment of the society.

Table 5 Distribution of Participants by Literacy Status

Literate	Illiterate	Total Respondents
49(90.74)	5(9.26)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 5 indicates that majority of the people participating in the public consultation meeting were literate. It is more evident from the fact that about more than 90 per cent of total respondents were literate. The highest literacy among the participants may be attributed to old educational institutions available in the region.

Table 6 Distribution of Participants by Level of Education

Under Matric	Matric	Graduate	Other Professional Qualification	Illiterate	Total
20(37.03)	23(42.60)	5(9.26)	1(1.85)	5(9.26)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 6 shows the distribution of participants by level of educational attainments. The level of educational attainment could be taken as an indicator of social development of any region. The statistics indicates that the proportion of respondents at the below matriculation level has been about 37.03 per cent. The highest proportions (42.60%) of respondents have observed as matriculates. However one tenth per cent of total respondents reported as graduates and same per cent have enumerated as illiterate. Other than this only 1.85 per cent of the respondents trained in the vocational and other job-oriented courses. It shows that public consultation meeting has participated by aware and educated people of the area.

Table 7 Distributions of Participants by Occupation

Agriculture	Private Service	Govt. Service	Business	Total Respondents
45(83.33)	1(1.85)	3(5.55)	5(9.27)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 7 depicts the distribution of participants of stakeholders meeting by occupation. It is evident that highest proportion (83.33%) of the respondents is involved in primary activities particularly in agriculture. About 9.27 per cent and 5.55 per cent respondents are engaged in business and government services. The proportion of the respondents earning their livelihood from private services is minimum (1.85 per cent) in the area.

Table 8 Distributions of Participants by Level of Yearly Income (Rs.)

Less Than 25,000	25,000 – 50,000	50,000 -1,00,000	1,00,000 and Above	Total Respondents
20(37.04)	24(44.45)	6(11.11)	4(7.40)	54(100.00)

Figures in parentheses show the percentage to total respondents

The table 8 shows the distribution of participants by level of annual household income. Considering the range of income of the respondents, the entire population has been divided into four categories. The data reveals that the level of annual household income varies from less than Rs. 25,000 to more than Rs. 1, 00,000 in the region. The highest proportion of the participants, having yearly income in between Rs. 25,000-50,000, is about 44.45 per cent. The proportion of households earning more than one lakh in a year is just 7.40 of total respondents. Out of total respondents 37.04 and 11.11 per cent of the total respondents are having the annual income less than Rs. 25,000 and Rs. 50,000 to 1, 00,000 respectively.

Table 9 Distribution of Respondents by Location

ROW	Diversion Line	ROB	RUB	Parallel to Rail Line	Total Respondents
1(1.85)	53(98.15)	Nil	Nil	Nil	54(100.00)

Figures in parentheses show the percentage to total respondents

Table 9 brings out that majority of participants have their settlements and agricultural land along the proposed diversion rail line. It is noted that row of way (ROW) has also not been occupied illegally by the squatters or migrants and local villagers as well. Hence, overwhelmingly majority 98.15 per cent of the project-affected families have their settlements and other physical property in the proposed detour area mainly in Dohki, Gokulgarh, Kaluwas, Saharanwas, Chandawas to name a few. Insignificant proportions (1.85) of the respondents have their settlements and lands in the RoW particularly in Kund village.

Table 10 Distribution of Participants by Impact

Significant	Relatively Significant	Insignificant	Negligible	Total Respondents
51(94.45)	1(1.85)	1(1.85)	1(1.85)	54(100.00)

Figures in parentheses show the percentage to total respondents

Table 10 reveals that majority (94.45 per cent) of the respondents feel that dedicated freight corridor project will exercise significant impact on them. The significance level has been assessed in terms of the guidelines given in questionnaires. Same per cent (1.85%) of participants are having the opinion that the project will have insignificant, relatively significant and negligible impact on their daily life style.

Table 11 Distribution of Respondents by Type of Impact

Loss of land	Loss of Livelihood	Loss of land and Occupation	Others	Total Respondents
48(88.90)	2(3.70)	3(5.55)	1(1.85)	54(100.00)

Figures in parentheses show the percentage to total respondents

Table 11 points out that nearly 90 per cent participants are likely to loose their agricultural land and land put to non agricultural uses which include courtyard, open cattle shed etc. About one twentieth of participants feel that they will lose their Land and occupation due to this freight rail link. About 3.70 per cent of the respondents will have negative impact on their livelihood. Only 1.85 per cent of the participants face impacts other than those mentioned above. Hence the study shows that the DFC is likely to exercise negative impacts on land, occupation and other sources of livelihoods.

Table 12 Distributions of Respondents by Compensation Desired

Land	Cash	Land and Service	Cash and Service	Others	Total Respondents
21(38.90)	23(42.60)	5(9.25)	3(5.55)	2(3.70)	54(100.00)

Figures in parentheses show the percentage to total respondents

Table 12 shows that 38.90% of total participants want land in lieu of their agricultural land and utmost 42.60% of respondents have posed faith in monetary compensation. About one tenth of the total respondents having the view that they need compensation in the form of land and service while one twentieth demand for service with cash. However very small per cent of the respondents need compensation other than mentioned above.

Suggestions: Although the suggestions of project affected families have been recorded during the village meetings and duly submitted to the Mantec Consultants in the Village meeting reports. However, some people have also proposed some following suggestions in the 3rd public consultation meeting:

Table 13 Percentages of Participants by Suggestions

S No	Total Participants
A	5(9.25)
B	28(51.85)
C	33(61.11)
D	13(24.07)
Total	54(100.00)

Figures in parentheses show the percentage to total respondents

A Rail Bridge and Crossing Gate; B Employment to Family Member; C Land and Cash; D others

Table 13 indicates that the enormous per cent (61.11) of the total participants need cash and land in compensation. About 51.85 per cent participants feel that the high speed freight train could enhance employment opportunities to secure the future of villagers residing nearby. About one-tenth of total participants want that crossing gates and Rail Bridge must be constructed near their settlements. The other suggestions proposed at the public consultation meeting include the share of 24.07 percent.

11. Question Answer Session

During the interactive session of the public consultation meeting a lot of discussion took place among stakeholders, administrators, local politicians, transport union leaders, media persons and organizers of the meeting. The major issues that emerged during the discussions and suggestions regarding dedicated freight corridor (DFC) together are described as under:

Q-1 Sarpanch of Village Dohki "the precious land is likely to be consumed under proposed DFC. What is the compensation being provided to his them? He also demanded that a cargo handling station should be constructed in Rewari"

Ans-1 Representative of Mantec replied that the compensation would be decided by Ministry of Railways as per National Rehabilitation Policy (2003), if approved National Rehabilitation Policy (2006) may also be considered for providing the compensation. In another response, he told that there is provision of one freight railway station near Harinagar.

Q-2 "What are the provisions for safety measures".
Ans-2 The present freight rail link is being planned and executed by Japanese assistance and modern Japanese technology will be employed in this project. Hence, regarding the safety measure implementing authority will employ proper arrangements.

Q-3 "Are there some difference in land rates of NPR2003 and 2006?
Ans-3 He was told that there are some differences in draft proposal of NPR 2006 and NPR 2003 so far as land value is concerned and if the later policy is approved by the time implementing agency acquires the land, project affected families would get the benefits accordingly.

Q-4 Sarpanch of Gokulgarh "when the detailed sketches would be available regarding the land acquisition"?
Ans-4 The work is in progress and Khasra maps are being considered and detailed drawings would be made public shortly.

Q-5 "What is the provision of underground water pipelines"?
Ans-5 These water pipelines would be considered while laying the freight rail line. He also expressed the possibility that these water pipelines could also be deepen further.

Q--6 A villager raised the issue of controlled area. He opined that the proposed dedicated freight corridor project falls under the boundaries of Master Plan of Rewari. How it would be implemented as construction is prohibited in this area?
Ans-6 He was assured that the matter will be discussed with higher authorities and even realigning the proposed dedicated freight corridor project falling in Master Plan area of the district.

12. Summary of Major Findings
About fifty four respondents of thirteen villages participated in the public consultation meeting. The representation of public has almost same with little variations ranging between 1 person to highest 10 persons in the whole villages. The Gokulgarh village has shown the highest participation. . People of Other Backward class were the (48.2%) representatives in the meeting. The respondents having large (i.e. more than 6 persons) family size have registered highest (50%) participation in the meeting. The analysis reveals that all the respondents are original inhabitants. The meeting was participated by literate persons. More than 90 per cent of respondents were enumerated as literates. The highest proportion (42.6%) of respondents participating in the meeting has observed matriculates. The participation of graduates has observed 9.3% of total respondents.
It is discovered that more than 80% of respondents are engaged in agriculture. Despite the higher participation in the agricultural activities the level of annual household income is quite high in the region as per Indian standards. It is investigated that about 95% participants are not satisfied with the existing railways facilities for the physical movement of goods. The growing awareness among the respondents towards national interests is evident from the fact that majority of the participants are in agreement to leave their land and property to fulfill the requirement of DFC project. They also said that Govt. should provide them appropriate compensation.

13. Newspaper Reporting

प्रणाम

श्रावण कृष्ण एकादशी
वि.सं. 2064, मृगशिरा, हर्षण
कामिका (कामदा) एकादशी व्रत

आज शहर में

फुटबाल : रेवाड़ी के सैनी स्कूल में पांच दिवसीय प्री-सुब्रतो मुखर्जी फुटबाल कप प्रतियोगिता।

प्रदर्शनी : रेवाड़ी के बाल भवन में तीन दिवसीय आर्ट एण्ड क्राफ्ट प्रदर्शनी।

सर्कस : रेवाड़ी के बावल रोड स्थित हुडा ग्राउंड में अमर सर्कस के शो।

प्रवचन : नारनौल के पलींजज स्थित जैन मांगलिक भवन में चातुर्मास के दौरान प्रवचन कार्यक्रम।

ज्ञानयज्ञ : महेंद्रगढ़ की बाबा जयराम दास धर्मशाला में श्री शिवपुराण ज्ञानयज्ञ सप्ताह जारी।

बैठक : नारनौल में भाजपा किसान मोर्चा की जिला कार्यकारिणी की बैठक जिला कार्यालय में।

फिल्म : रेवाड़ी के राधिका थिएटर में 'केश', एवरेस्ट मल्टीप्लेक्स यूनिट एक में 'पार्टनर' यूनिट दो में 'मैं हूं बलवान' का प्रदर्शन।

बदलेगा फ्रेट कारिडोर का मार्ग

- मास्टर प्लान-2021 को ध्यान में रखते हुए सर्वे एजेंसी ने लिया निर्णय
- आपत्तियों की सुनवाई के दौरान उठा मामला

रेवाड़ी, मुख्य संवाददाता : रेवाड़ी के रास्ते दिल्ली से मुंबई को जोड़ने वाले पश्चिमी फ्रेट कारीडोर का प्रस्तावित मार्ग फिर बदलेगा। यह बदलाव रेवाड़ी शहर से सटे कुछ गांवों तक ही सीमित रहेगा। प्रस्ताव मार्ग का सर्वे कर रही पंचकुला की गैर सरकारी संस्था 'आइसपर' ने रेवाड़ी शहर के लिए नगर एवं आयोजना विभाग द्वारा तैयार किए गए मास्टर प्लान-2021 को ध्यान में रखकर यह निर्णय लिया है।

बुधवार को उपायुक्त चंद्रप्रकाश की अध्यक्षता में जिला सचिवालय में हुई बैठक में प्रस्तावित मार्ग के लिए आपत्तियों की सुनवाई की गई।

इसी दौरान रेवाड़ी के मास्टर प्लान का मुद्दा उठा। बैठक में एडीसी एसएस दलाल, जिला विकास एवं पंचायत अधिकारी पृथ्वी सिंह, सर्वे टीम के जापानी मार्गदर्शक शुशुके मिनाटो व जिला प्रशासन के कई अधिकारी मौजूद थे।

'आइसपर' के पदाधिकारियों ने माना कि सर्वे के दौरान चिह्नित किया गया आठ किलोमीटर लंबा 'डिटूर' (बाइपास की तरह बिछाई जाने वाली घुमावदार रेलवे लाइन) कुछ स्थानों पर रेवाड़ी शहर के लिए तैयार किए गए मास्टर प्लान-2021 को प्रभावित कर रहा है।

आपत्तियों की सुनवाई के दौरान यह सुझाव सामने आया कि अगर सर्वे के दौरान चिह्नित किए गए बाईपास रेलमार्ग को घेरा 500 से 1500 मीटर बाहर की ओर कर दिया जाए तो रेल फ्रेट कारीडोर के लिए बिछाई जाने वाली डायवर्सन लाइन (डिटूर) से मास्टर प्लान-2021 पूरी तरह अप्रभावित रहेगा।

यह सुझाव सर्वे टीम के गले उतर गया, लेकिन आश्चर्यजनक यह है कि सर्वे करते समय मास्टर प्लान जैसे महत्वपूर्ण मुद्दों पर सर्वे एजेंसी ने पहले ही क्यों ध्यान नहीं दिया, जबकि रेवाड़ी एनसीआर का महत्वपूर्ण शहर है।

सर्वे टीम से जुड़े इंजीनियर संजीव शर्मा ने बताया कि बाइपास रेलवे लाइन को शहर के मास्टर प्लान से बाहर रखने का सुझाव कीमती है।

इसके मद्देनजर अब प्रस्तावित आठ किलोमीटर लंबे 'डिटूर' का नया मार्ग चिह्नित किया जाएगा, लेकिन यह प्रस्तावित मार्ग से मात्र कुछ सौ मीटर की दूरी पर ही होगा।

उल्लेखनीय है कि पश्चिम फ्रेट कारीडोर की रेवाड़ी जिले में कुल लंबाई लगभग 28 किलोमीटर है। इसमें आठ किलोमीटर का डिटूर (बाइपास रेल मार्ग) शामिल है।

इसके अलावा 20 किलोमीटर लंबी लाइन पहले से बिछी रेलवे लाइन के साथ बिछाई जाएगी। वर्तमान सर्वे के अनुसार रेलवे बाइपास (डिटूर) डोहकी से गोकलगढ़, कालूवास व चांदावास होते हुए हरीनगर के पास मुख्य रेलवे लाइन में मिलना प्रस्तावित था, लेकिन अब यह लाइन हरीनगर से कुछ और आगे मिलाई जाएगी।

शेष 20 किलोमीटर लंबा मार्ग पूर्ववत रहेगा। बैठक में ग्रामीणों ने उचित मुआवजा व प्रभावित होने वाले परिवारों को रेलवे में रोजगार देने की मांग भी उठाई।

सर्वे टीम के अनुसार 20 किलोमीटर लंबाई तक मात्र 24 मीटर चौड़ी पट्टी ही अधिग्रहीत की जाएगी, जबकि 8 किलोमीटर लंबे घुमाव यानी बाईपास के लिए 65 मीटर चौड़ा क्षेत्र अधिग्रहीत किया जाएगा।

उपायुक्त चंद्रप्रकाश ने प्रभावित लोगों की हर संभव मदद का आश्वासन दिया।

ANNEX– 6.3

2ND STAGE OF DISTRICT LEVEL STAKEHOLDER/PUBLIC CONSULTATION MEETING IN MAHENDERGARH DISTRICT

1.1 BRIEF DESCRIPTION OF THE DISTRICT MAHENDRAGARH

Mahendergarh district is located in southwest part of Haryana. It lies between 270 47'50" and 280 28' 00" North latitudes and 750 54' 00" and 760 22' 11" East longitudes. It is surrounded by Rajasthan state in east and southwest. Bhiwani and Rewari districts of Haryana mark the north and remaining parts of the district respectively. There are five towns and 368 inhabited villages in Mahendergarh district. Its total geographical area is about 1899 sq km. It is inhabited by about 8, 13,000 persons. The male population of the district is about 4, 24,000 and female population is 3, 89,000. The population density in the district is 428 persons per sq km. The proportion of scheduled caste population in total population is merely 16.31 per cent. The literacy rate in the district is about 70 per cent (Census of India, 2001). It is noted here that the literacy rate in the district is above the state average.

Due to the sandy and hilly nature of the district, its climate is dry. The summers are hot and winter season is quite cold in the district. There are two cropping seasons in the district. The major crops grown during the year include wheat, barley, jowar, bajra, toriya, taramira, mustard and cotton.

1.2 PROJECT FEATURE IN MAHENDRAGARH DISTRICT

- Total length of DFC corridor in Mahendragarh district is approximately 45km
- In Mahendragarh district DFC go along with existing railway line
- There are some major and minor railway-road crossing in the district
- There are some people likely to be affected in Pawera village and Ateli Mandi region
- The major settlements along the corridor are Begpur Ateli, Ateli Mandi, Mirzapur, Bachhod, Narnaul Nai Mandi, Amarpura Jarai, Chhilro, Nizampur, Napla.

2.1 PCM SUMMARY SHEET

Project Summary Sheet	
Title of the Project	Conducting 2nd Stage of District Level Stakeholder/Public Consultation Meeting for Development Study Regarding Dedicated Multimodal High Axle Freight Corridor for Ministry of Railways, Government of India.
Date and Place of Meeting	Bachat Bhawan, Narnaul on 27-06-2007
Local Consultant	MANTEC CONSULTANTS Pvt. Ltd. New Delhi.
Local Organizer	'Institute for Spatial Planning and Environment Research' (ISPER), C-1, Amravati Enclave, P.O. Chandimandir, Tehsil Kalka, District Panchkula, Haryana.
Organizing Place	Narnaul
Number of Invitees	About 200 as a letter was also routed through Deputy Commissioner to invite the Stakeholders, hence difficult to specify the actual figure.
Number of Presence	140
Methods Used for Information Dissemination	Personal Contact Dispatching Invitation Letter Information on Newspaper Information on TV Information Bills at State office Information Bills at District office Information Bills at Panchayat office Announcement by Auto Rickshaw Others (Specify)
Stationery Served to the Participants	Handout
	Writing pad
	Ball pen
	Questionnaire
Methods Adopted for Discussion	Slide Presentation Lecture Group Discussion Question/Answer session
Methods Adopted for Documentation	Still Photography Audio/Video Recording Minutes of Meeting
Media Coverage	TV (Name) Newspaper (Name) 1. Press Correspondent, Dainik Bhaskar (Hindi) 2. Press Correspondent, Punjab Kesari (Hindi) 3. Press Correspondents, Dainik Jagran (Hindi) 4. Press Correspondent, Amar Ujala (Hindi) 5. Press Correspondent, Hari Bhumi (Hindi).

2.2 SELECTION OF STAKEHOLDER (LIST OF INVITEES)

Deputy Commissioner, Mahendergarh

Additional Deputy Commissioner, Mahendergarh
District Development and Planning Officer, Mahendergarh
District Public Relations Officer (DPRO), Mahendergarh
Block Development and Panchayat Officer, Narnaul
General Managers, Industries, District Mahendergarh.
Village Panchayat Sarpanchs, Mahendergarh

(1) Ministry of Railways

1 Station Master, Narnaul
2 Station Staff

(2) Road Transporter

1 Local Transport, Union (i)
2 Local Transport Union (ii)

(3) Traders

1 Charu Chilled Water Suppliers, Narnaul
2 Sanjeev Hard wares Ltd
3 Messers ACC Cement Suppliers
4 President Grain Market, Narnaul

(4) Media

1 Press Correspondent, Punjab Kesari (Hindi)
2 Press Correspondents, Dainik Jagran (Hindi)
3 Press Correspondents, Dainik Bhaskar (Hindi)
4 Press Correspondents, Amar Ujala (Hindi)
5 Press Correspondents, Hari Bhumi (Hindi).

2.3 METHOD OF SELECTION OF STAKEHOLDER

The latest version of JICA Guidelines for Environment and Social Consideration has been developed in 2004 so that JICA funded feasibility study incorporates due consideration of the environmental protection and safeguards the sectors of society directly or indirectly affected by the project. Current feasibility study is carried out applying this guideline

In order to encourage participation of the local residents, Stakeholder/ Public Consultation Meeting is considered as a tool that should play an important role during the project design stage. It is designed to

- Disclose information on project for open discussion.
- Disseminate information to the lowest possible hierarchy of the social system.

- Obtain interaction of the participants of Stakeholder/Public Consultation Meetings.
- Reflect the valid comments elicited from the open discussions to the design of the project.
- Build a consensus on the project implementation and associated factors.

There are three stages of Stakeholder and Public Consultation Meetings. The first stage of Stakeholder/Public Consultation Meeting is held on state level, followed by second stage of Stakeholder/Public Consultation Meeting held in the districts, and the third stage of stakeholder/ public consultation meeting is held in the villages directly affected by the project.

The Mantec Consultants Pvt. Ltd has already organized first stage of Stakeholder/Public Consultation Meeting in the state of Haryana

To organize the second stage of Stakeholder/ Public Consultation Meeting Mantec consultants has authorized " 'Institute for Spatial Planning and Environment Research' (ISPER), to meet the concerned government authorities and collect relevant data for carrying forward the social environment study and organize second stage of Stakeholder/Public Consultation Meeting for information dissemination about the project As per direction of the guidelines for conducting the 2nd stage of the Stakeholder/ Public Consultation Meetings a formal order of the Ministry of Railways was got issued vide their letter dated 01-06-07 to facilitate these meetings .

Further, continuous efforts were made to keep the Ministry of Railways involved in the project as the major stakeholder through their local set-up. Rehabilitation Commissioners were also appointed from the state government departments. Similarly Department of Environment and Forestry and State Pollution Control Boards were contacted to participate in the Meetings. State Government Departments were also apprised and approached and were invited to participate in the

Stakeholders/Public Consultation Meetings including the State Public Works Department, Irrigation and Power, Urban Development and Poverty Alleviation Department, industries, telecommunication and Information technology Trade and Commerce, Surface Transport, Tourism, Container/Corporation of India, Port Trusts etc.

Our meeting Facilitator Team visited all the affected villages and requested Primary and Secondary Stakeholders to attend the meeting. Our meeting facilitator team preferred to invite the people who will be affected directly by this project. Our team also met & informed the dist. Administration and requested to help in organizing the public meeting successfully. Local stakeholders along the railway line, affected farmers, businessmen, private service and Govt. service employees were invited in the meeting. Our study team also contacted

Tehsildars of affected Tehsils, Panchayat Samiti Pramukhs, Gram Pradhan, local MLA and requested them to attend the meeting and also gave necessary support in conducting second stage of Stakeholder/Public Consultation Meeting. The main objective of the second stage of Stakeholder/Public Consultation Meeting is to disseminate the general information to public. In the State of Harayana two districts will be affected by this DFC project Not only that our meeting facilitator team visited all the affected villages and requested primary and secondary Stakeholder to attend the meeting. Satterfield random sampling method was also used for the selection of Stakeholders because limited people had to be invited. Our meeting facilitator team also took consideration while extending invitations that vulnerable group of affected area should definitely be present in the meeting.

Stakeholders /Public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project. The second public consultation meeting for Mahendargarh district of Haryana state was conducted at Bachat Bhawan, Narnaul on 27-06-2007 under the chairmanship of Deputy Commissioner, Sh M.P.Bansal (IAS), Narnaul. Other dignitaries participating in the meeting were Additional Deputy Commissioner, District Development and Panchayat Officer (DDPO), District Public Relations Officer (DPRO), local industrialists, traders and educationists and other district level officials.

It is noted here that the total freight rail line is about 46.5 km in Mahendergarh district. As per the existing norms, 20m strip of land in east direction from the middle of existing rail line will be occupied. The project-affected families (PAFs) would be properly compensated, rehabilitated and resettled as per the National Rehabilitation Policy, 2006. Although, this freight rail line will pass through many villages. However, the severely affected villages on this proposed freight rail link in the district are Pawera, Narnaul (near railway station), Patikra, Uninda, Atteli Mandi, Tajpur, Bajad, Ganiyar and Chandpura.

2.4 SELECTION OF MEETING FACILITATOR

Simultaneously extensive surveys were conducted for the identification of suitable local agencies for the successful organization of the second stage of Stakeholders/Public Consultation Meetings.

Preference was given to appoint Non Government Organizations (NGO) who had local presence, popularity and experience of social and public works. It has to be well acquainted

with multifarious cross section of society to help in the selection of the right type of Stakeholders for the meetings as well as for facilitating other related activities. i.e.

- Venue for the meetings
- Arrangement to be made
- Assisting in local publicity
- Invitation to the Stakeholders and motivating them for participation
- Maintaining and compilation of record and feed back and
- Other local arrangements like transport, hospitality, security and smooth conduct of the meeting proceedings.

The NGO 'Institute for Spatial Planning and Environment Research' was appointed for facilitating the second stage of Stakeholder and Public Consultation meeting, socio-economic survey and village level meeting

2.5 METHOD OF INFORMATION DISSEMINATION

Our organization sought the help of government machinery for inviting the project-affected families. An official letter was routed by Deputy Commissioner to District Development and Panchayat officer (DDPO) to invite the entire village Panchayat Sarpanchs of Mahendergarh to participate in the meeting. The same notification was also issued to General Manager, Industries to participate the meeting and propose their suggestions.

Besides meeting facilitator team visited all the villages located along the existing railway line in the district and briefed up about this freight rail link to the villagers and role of Public consultation meeting in the execution of this project. Meeting facilitator team also disseminated the reports of the first public consultation meeting held at Saha in Mahendergarh district among the villagers.

Meeting facilitator team also made a close correspondence with local media personnel and disseminated a lot of information about the meeting before and after the meeting. The copies of media reports are enclosed with the report. Our team also displayed banners and relevant handouts showing major features of the project and DFC alignment passing through the Mahendergarh district.

2.6 VENUE OF STAKEHOLDER/ PUBLIC CONSULTATION MEETING

Bachat Bhawan, Narnaul on 27-06-2007

3.0 PARTICIPANTS OF STAKEHOLDER/PUBLIC CONSULTATION MEETING

A) List of Participants

Deputy Commissioner, Mahendergarh
Additional Deputy Commissioner, Mahendergarh
District Development and Planning Officer, Mahendergarh
District Public Relations Officer (DPRO), Mahendergarh
Block Development and Panchayat Officer, Narnaul
General Managers, Industries, District Mahendergarh.
Village Panchayat Sarpanchs, Mahendergarh

List of Village Sarpanchs

Sl. No.	Name of Village	Name of Sarpanch
1	Beeta	Charan Jeet
2	Chundiala	Parminder Kaur
3	Chundiali	Madan Lal
4	Dakola Khan	Kamaljit Kaur
5	Dani Pur	Amar lal
6	Harauli	Tarolachna Devi
7	Kesari	Rakesh Kumar
8	Khan Pur	Mrs. Kamal Jeet
9	Maggarpur	Kaka Singh
10	Nagal Jattan	Karnail Singh
11	Panjail	Dharam Pal
12	Narnaul	Suresh Kumar

B) Other Staleholders

A large number of people (115) participated as stakeholders.

3.1 DETAILS OF STAKEHOLDER AND PUBLIC CONSULTATION MEETING

Stakeholders /public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project.

3.2 RECORD OF MEETING

The public consultation meeting started at the scheduled time. The minutes of the meeting are detailed out as follows:

3.00 P.M to 3.10 P.M. The public consultation meeting started at 3.00 P.M. Deputy Commissioner came at 3.05 P.M. The organizers of meeting showed proposed freight rail alignment and list of affected villages displayed outside the meeting hall to the Deputy Commissioner and other dignitaries. The Deputy Commissioner inaugurated the stakeholders meeting.

3.10 P.M. to 3.15 P.M. Meeting facilitator made a welcome address and briefed the theme to the participants. He introduced Mantec Representative to the chief guest and other participants.

3.15 P.M. to 4.15 P.M. Mantec Representative made his presentation on the objectives and features of dedicated freight corridor project. He dwelled upon each component of the DFC. Participants showed keen interest in the presentation.

4.15 P.M. to 4.20 P.M. Deputy Commissioner, Mahendergarh in his presidential remarks informed the public that DFC project has many dimensions and likely to generate better employment opportunities both at the regional and national level. He also informed the public that local people would harness best benefits if some cargo handling yards and a freight rail station is opened at Atelli Mandi or Narnaul.

4.20 P.M. to 4.40 P.M. During the interactive session a lot of discussion took place among the primary stakeholders, administrators, local politicians, traders, educationists, media persons and organizers of the meeting. The questions/answers and suggestions are recorded separately.

4.40 P.M to 4.50 P.M. A press conference was organized and local press reporters sought information about the project.

4.50 P.M. to.4.55 P.M. The meeting ended with vote of thanks to the chair.

3.3 PROFILE DESCRIPTION OF PARTICIPANTS

The major observations of Stakeholders/Public consultation meeting held at Narnaul on 27-06-2007 recorded through questionnaires are as follows:

Table 1.1 Distributions of Respondents by Village

Sl. No.	Name of Village	Total Respondents
1	Akbarpur	1 (0.86)
2	Annawas	1 (0.86)
3	Atteli Begpur	1 (0.86)
4	Bashirpur	2 (1.73)
5	Bhilwara	1 (0.86)
6	Bhalki	1 (0.86)
7	Bajar	5 (4.34)
8	Dostpur	1 (0.86)
9	Dhani Bhatoder	1 (0.86)
10	Digrota	1 (0.86)
12	Fatehpur	1 (0.86)
13	Gahilli	1 (0.86)
14	Ghaniyar	5 (4.34)
15	Godha	1 (0.86)
16	Jainpur	1 (0.86)
17	Jatwas	1 (0.86)
18	Jorasi	1 (0.86)
19	Kheri	1 (0.86)
20	Modlana	1 (0.86)
21	Mitarpura	1 (0.86)
22	Muloli	1 (0.86)
23	Narnaul	41 (35.65)
24	Napla	10 (8.69)
25	Patikra	2 (1.74)
26	Pavera	6 (5.21)
27	Rampura	2 (0.86)
28	Rasurpur	1 (0.86)
29	Saraibahadur	1 (0.86)
30	Seka	1 (0.86)
31	Silarpur Mehta	1 (0.86)
32	Salabpur	2 (0.86)
33	Tajpur	2 (1.74)
34	Talot	2 (1.74)
35	Thani Thota	1 (0.86)
36	Thana	1 (0.86)
37	Tobara	1 (0.86)
38	Uninda	11 (9.56)
	Total	**115**

Note: Figures in parentheses show the percentage to total respondents

Table 1.1 reveals that there were one hundred and fifteen respondents, natives of thirty eight villages, participating in the public consultation meeting on dedicated freight corridor project. It indicates the wider representation of village Sarpanchs and other invitees. The Narnaul

village has shown the highest representation, which accounts for about one third (35.65%) of total participants. The Uninda village has shown about one-tenth (9.56 %) of total participants. The Napla, Ganniar and Bajad villages, which are likely to be affected, have also shown considerable participation in the meeting. Interestingly, Panchayat Sarpanchs of 12 villages represented the meeting

Table 1.2 Distribution of Participants by Caste

Scheduled Caste	Other Backward Class	General	Total
6(5.20%)	82(71.30%)	27(23.50%)	115(100.00%)

Note: Figures in parentheses show the percentage to total respondents

There are no scheduled tribes in Haryana state as per Census of India. The representation of Other Backward castes was the highest i.e. 71.30 per cent. The data show that little less than one fourth participants were from general category. The study reveals that the representation of scheduled castes has been very low in the public consultation meeting.

Table 1.3 Distribution of Participants by Family Size

Scheduled Caste	Other Backward Class	General	Total
6(5.20%)	82(71.30%)	27(23.50%)	115(100.00%)

Note: Figures in parentheses show the percentage to total respondents

Table 1.3 brings out that the family size varies from less than four persons to more than six persons in Mahendergarh district. The respondents having small family size i.e. less than 4 persons have only one tenth of participation. The respondents having moderate (i.e. less than 6 persons) family size have witnessed moderate participation that constitutes about one-third of total respondents. Participants having large family size i.e. more than 6 persons have shown about 58 per cent of participation.

Table 1.4 Distribution of Participants by Origin and Numeric Strength

Native	Non-Native/Migrated	Total	Majority	Minority	Total
115(100)	NIL	115(100.00)	78(67.82)	37(32.18)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

The Table 1.4 points out that cent percent of the respondents are original inhabitants of the region. It is also evident that about two-third of the respondents stated the majority of their caste/community in different villages of the district. Whereas, little less than one-third of the participants owe their origin to the minority segment of the society.

Table 1.5 Distribution of Participants by Literacy Status

Literate	Illiterate	Total
97(84.34)	18(15.66)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

The Table 1.5 indicates that majority of the people participating in the public consultation meeting were literate. It is more evident from the fact that about 84 per cent of total respondents were literate. The highest literacy among the participants may be attributed to old educational institutions available in the region.

Table 1.6 Distribution of Participants by Level of Education

Under Matric	Matric	Graduate	Other Professional Qualification	Total
32(27.82)	41(36.65)	11(9.56)	13(11.30)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.6 shows the distribution of participants by level of educational attainments. The level of educational attainment could be taken as an indicator of social development of any region. The statistics indicates that the proportion of respondents at the below matriculation level has been about 27.82 per cent. The highest proportions (36.65 %) of respondents have observed as matriculates. The analysis shows that as the educational level increases the proportion of the respondent's decreases. It is ascribed to the backward economy of the region as evident from the table 7. As only little less than one tenth of total respondents have reported as graduates. Little more than one –tenth of total respondents have enumerated as trained in vocational and other job-oriented courses. It shows that public consultation meeting has participated by aware and educated people of the area.

Table 1.7 Distributions of Participants by Occupation

Agriculture	Private Service	Govt. Service	Business	Total
46(40)	26(22.60)	16(13.90)	27(23.48)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.7 depicts the distribution of participants of stakeholders meeting by occupation. It is evident that highest proportions (40 per cent) of the respondents are involved in primary activities particularly in agriculture. About 22.60 per cent and 23.48 per cent respondents are engaged in private and business activities. The proportion of the respondents earning their livelihood from government services is minimum (13.90 per cent) in the area.

Table 1.8 Distributions of Participants by Level of Yearly Income (Rs)

Less than 25,000	25,000 – 50,000	50,000 -100,000	100,000 and Above	Total
41(35.65)	26(22.60)	20(17.39)	28(24.34)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.8 shows the distribution of participants by level of annual household income. Considering the range of income of the respondents, the entire population has been divided into four categories. The data reveals that the level of annual household income varies from less than rupees 25,000 to more than rupees 1, 00,000 in the region. The highest proportion of the participants falling less than 25,000 category is about 35.65 per cent. The proportion of households earning more than one lac in a year is about one-fourth of total respondents.

Table 1.9 Distribution of Respondents by Location

ROW	Diversion Line	ROB	RUB	Parallel to Rail Line	Total
Nil	Nil	Nil	Nil	115(100.00)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.9 brings out that cent percent participants have their settlements and agricultural land along the existing rail line. It is noted that row of way (ROW) has also not been occupied illegally by the squatters or migrants and local villagers as well. Hence, all the project-affected families have their settlements and other physical property parallel to the railway line.

Table 1.10 Distribution of Participants by Impact

Significant	Relatively Significant	Insignificant	Negligible	Total
72(62.61)	13(11.30)	2(1.74)	28(24.35)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.10 reveals that majority (62.61 per cent) of the respondents feel that dedicated freight corridor project will exercise significant impact on them. The significance level has been assessed in terms of the guidelines given in questionnaires. About one tenth participant are likely to experience relatively significant impacts due to this project. The proportion of participants having negligible impact on their livelihood is about one-fourth of the total participants.

Table 1.11 Distribution of Respondents by Type of Impact

Loss of land	Loss of Occupation	Loss of Livelihood	Others	Nil	Total
51(44.35)	24(20.87)	49(42.61)	27(23.48)	16(13.91)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.11 points out that about 44 per cent participants are likely to loose their agricultural land and land put to non agricultural uses which include courtyard, open cattle shed etc. About one fifth of participants feel that they will lose their main occupation due to this freight rail link. About 42% of the respondents will have negative impact on their livelihood. About little less than one fourth of the participants will face lose in terms of tube wells, houses, cattle sheds etc. Hence the study shows that the DFC is likely to exercise negative impacts on land, occupation and other sources of livelihoods.

Table 1.12 Distributions of Respondents by Compensation Desired

Land	Cash	House	Not Affected	Total
66(57.39)	20(17.39)	33(28.70)	18(15.65)	115(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1.12 shows that 57% of total participants want land in lieu of their agricultural land. Only 17% of respondents have posed faith in monetary compensation. About 28% of participants stated that they should be properly re-settled at places of their choices .The proportion of participants who have not any kind of repercussions from this freight rail link.

3.4 QUESTION / ANSWER SESSION

During the interactive session of the public consultation meeting a lot of discussion took place among stakeholders, administrators, local politicians, transport union leaders, media persons and organizers of the meeting. The major issues that emerged during the discussions and suggestions regarding dedicated freight corridor (DFC) together are enumerated as under:

Question 1 Participant from Village Pawera “Sir my entire house, shops and tube well is falling under proposed DFC. What type of compensation will be provided to us?

Answer 1 Mantec representative “the compensation would be decided by Ministry of Railways as per National Rehabilitation Policy (2006)”.

Question 2 Participant from Village Amarpur “what are the provisions for noise pollution and safety measures”?

Answer 2 Mantec representative “The present freight rail link is being planned and executed by Japanese assistance and modern Japanese technology will be employed in this project. Hence, regarding the safety measure implementing authority will employ proper arrangements.

Question 3 Participant from Mehendragarh “What type of compensation would be provided to us”?

Answer 3 Mantec representative “Compensation of the project affected people will be according to NPRR-2006.

Question 4 A villager “rail link should pass through at least 500 m away from human habitations so that there could be minimum negative impact on the rural village life.”?

Answer 4 Mantec representative “While designing the alignment of proposed corridor, it has been kept in view, to avoid heavily built up area, Villages, Habitation to the extent feasible.

Question 5 one villager “Security measures should be taken along both sides of the Railway Tracks to save accident in the densely populated area”?

Answer 6 Mantec representative “we have already adopted higher technology and of course security measures should be taken along both side of the corridor to save accident in the densely populated area.

3.5 SUGGESTIONS

Table 1.13 Percentages of Participants by Suggestions

Sl. No.	Total Participants
A	31 (26.95)
B	16 (13.91)
C	14 (12.17)
D	12 (10.43)
E	11 (9.56)
F	9 (7.82)
G	6 (5.21)
H	6 (5.21)
I	4 (3.47)
J	4 (3.47)
K	2 (1.73)
Total	**115 (100.00)**

Note: A Rail Bridge and Crossing Gate; B Control on Vibration and Noise Pollution; C Proper Safety Measures, D Comments Declined; E Provision of Freight Rail Station; F Provision of Container Depot; G Provision of Cross Drainage H: Good Project to Us (Public) employment to One Family Member; J As per Government

Policy and K Better land Prices.

Table 1.13 indicates that about more than one-fourth of total participants want that crossing gates and Rail Bridge must be constructed near their settlements. About 13 per cent participants feel that the high speed of freight train could enhance noise pollution in the area hence there should be proper arrangement of vibration and noise controlling measures. About 12.17 percent of the respondents stated that proper safety measures must be provided to the villagers, as there are chances of accidents of animals and human beings. The other suggestions proposed at the public consultation meeting include provision of freight station and container depot either at Narnaul or Atteli Mandi, cross drainage under the rail line, employment to one person of the affected family in the Railways department and better land value to name a few.

3.6 SUMMARY OF MAJOR FINDINGS

About one hundred and fifteen respondents of thirty-eight villages participated in the public consultation meeting. The representation of public has almost same with little variations ranging between 1 person to highest 41 persons in the whole villages. The Narnaul village has shown the highest participation. . People of Other Backward class were the (35.65 per cent) representatives in the meeting. The respondents having large (i.e. more than 6 persons) family size have registered highest (58.20 per cent) participation in the meeting. The analysis reveals that all the respondents are original inhabitants. The meeting was participated by literate persons as more than 80 per cent of respondents were enumerated as literates. The highest proportion (36.65 per cent) of respondents participating in the meeting has observed matriculates. The participation of graduates has observed 9.56% 0f total respondents.

It is discovered that more than 40 per cent of respondents are engaged in agriculture. Despite the higher participation in the agricultural activities the level of annual household income is quite high in the region as per Indian standards. It is investigated that about 90 per cent participants are not satisfied with the existing railways facilities for the physical movement of goods. It is gratifying to note that that 85 per cent of respondents are in favour of this multi modal dedicated freight corridor.

All participants are in agreement to leave their land and property to fulfil the requirement of DFC project. They also said that Govt. should provide them appropriate compensation.

Newspaper Cuttings

The meeting organizers asked for the suggestions on the Alignment in Mahendragarh district from affected people.

कार्यक्रम

वेस्टर्न फ्रन्टीयर कारिडोर योजना के लिए नारनौल में चल रहा है सर्वे

प्रभावित क्षेत्र के लोगों के सुझाव मांगे

सर्वे के बाद रिपोर्ट केंद्र सरकार को भेजी जाएगी

हरिभूमि न्यूज (नारनौल)।
देश के चार महानगरों को मालगाड़ी स्पेशल ट्रेक से जोड़ने के लिए बनाई गई महत्वाकांक्षी वेस्टर्न फ्रन्टीयर कारिडोर योजना के लिए इंस्टीच्यूट फॉर स्पेशल प्लानिंग एण्ड एनवायरमेंट रिसर्च (इस्पर) पंचुकला द्वारा आजकल क्षेत्र में सर्वे का कार्य करवाया जा रहा है।

स्थानीय पंचायत भवन में बुधवार को इस संबंध में ही एक कार्यक्रम का आयोजन किया गया, जिसमें प्रभावित क्षेत्रों के लोगों को उनके सुझाव रखने के लिए आमंत्रित किया गया था। इस अवसर पर उपायुक्त एम.पी. बंसल, अतिरिक्त उपायुक्त अशोक कुमार बिश्नोइ, सर्वे टीम लीडर अनूपकौर, इसपर के निदेशक सुरजीत सैनी, संयोजक डा. बी.आर. ठाकुर आदि प्रमुख रूप से उपस्थित थे।

उल्लेखनीय है कि भारत सरकार द्वारा देश के चार महानगरों दिल्ली, मुम्बई, कोलकाता एवं चेन्नई को मालगाड़ी स्पेशल ट्रेक से जोड़ा जाना प्रस्तावित है तथा इस कार्य को भारत सरकार जापान की जी.आई.सी.ए. (जीका) कंपनी के सहयोग से पूर्ण करने में लगा हुआ है। इसी योजना के तहत दिल्ली से मुंबई रेलमार्ग बनाया जाएगा, जो रेवाड़ी-नारनौल शहर से निकाला जाएगा। उक्त रेलमार्ग के सर्वे के लिए आजकल पंचकुला स्थित एनजीओ की एक स्पेशल टीम क्षेत्र के प्रभावित गांवों का दौरा कर रही है। रेवाड़ी में जहां यह रेल मार्ग नए सिरे से बनाया जाएगा, वहीं जिला महेन्द्रगढ़ में इसे नैरोगेज लाईन के साथ ही बाईं ओर 20 मीटर जमीन का अधिग्रहण कर बनाया जाना है। जिला महेन्द्रगढ़ में कुल चौदह गांव इस योजना से प्रभावित होंगे, जिनमें बजाड़, गणियार, चंदपुरा, अटेली बेगपुर, उनिंदा, अटेली मंडी, ताजपुर, भीलवाड़ा, पटीकरा, तलोट, निजामपुर, पवेरा व नापला शामिल हैं। इसी रेलवे ट्रेक को बनाने के लिए प्रभावित होने वाले लोगों को आज नारनौल के पंचायत भवन में आमंत्रित किया गया था, जिन्हें संबोधित करते हुए उपायुक्त एम.पी. बंसल ने कहा कि रेलवे का प्रस्ताव बहुत ही सराहनीय है तथा इससे रेलवे की हाई स्पीड होने से कम समय में मालगाड़ियों का आवागमन सुलभ हो सकेगा।

यह ट्रेक पूर्णतया इलेक्ट्रीक एवं कम्प्यूटराईजड होगी। उन्होंने कहा कि जहां रेलवे ट्रेक निकाले जाने पर लोगों के प्रभावित होने की बात है, वहीं इसमें लाभ भी छुपे हुए हैं। उन्होंने कहा कि फिलहाल यह टीम सर्वे कर रही है तथा सर्वे करने के बाद रिपोर्ट को भारत सरकार के हवाले कर दिया जाएगा। इंडस्ट्रीज एसोसिएशन के प्रधान दयानंद सोनी ने कहा कि रेलवे ट्रेक बनना अच्छी बात है, किन्तु रेलवे स्टेशन नारनौल या जोरासी के बीच ही बनना चाहिए, ताकि यहां के बेरोजगारों को रोजगार मिल सके।

लोगों के सुझावों को सर्वे टीम द्वारा अंकित किया गया। सर्वे टीम लीडर अनूपकौर ने बताया कि आगामी 29 जून को रेवाड़ी के लघु सचिवालय के रूप नं 203 में प्रात: 11 बजे एक विशेष मीटिंग का आयोजन किया जाएगा, जिसमें सर्वे टीम के उच्चाधिकारी व जापान सरकार के प्रतिनिधि भाग लेंगे।

The affected areas people were asked for their suggestions and views on the DFC project.

ANNEX-6.4

3RD STAGE OF VILLAGE LEVEL STAKEHOLDER/PUBLIC CONSULTATION MEETING IN MAHENDERGARH DISTRICT

1.1 PCM SUMMARY SHEET

Project Summary Sheet	
Title of the Project	Conducting 3rd stage of District Level Stakeholder/Public Consultation Meeting for development Study Regarding Dedicated Multimodal High Axle Freight Corridor for Ministry of railways, Government of India.
Date and Place of Meeting	Panchayat Bhawan, Narnaul on 07-08-2007
Local Consultant	Mantec Consultants Pvt. Ltd. New Delhi.
Local Organizer	'Institute for Spatial Planning and Environment Research' (ISPER), C-1, Amravati Enclave, P.O. Chandimandir, Tehsil Kalka, District Panchkula, Haryana.
Organizing Place	Narnaul
Number of Invitees	About 500. It is noted here that ISPER study team during village level meetings had also personally invited the village Sarpanchs, Panchs and other project affected persons to attend the scheduled meeting. Besides a letter was also routed through Deputy Commissioner to invite the Village Panchayat officials and other project affected families.
Number of Presence	85
Methods Used for Information Dissemination	Personal Contact
	Dispatching Invitation Letter
	Information on Newspaper
	Information on TV
	Information Bills at State office
	Information Bills at District office
	Information Bills at Panchayat office
	Announcement by Auto Rickshaw
	Others (Through Telephones)
Stationery Served to the Participants	Handout
	Writing pad
	Ball pen
	Questionnaire
Methods Adopted for Discussion	Slide Presentation
	Lecture
	Group Discussion
	Question/Answer session
Methods Adopted for Documentation	Still Photography
	Audio/Video Recording
	Minutes of Meeting
Media Coverage	TV: (Name):
	Newspaper (Name):
	1. Press Correspondent, Dainik Bhaskar (Hindi)
	2. Press Correspondent, Punjab Kesari (Hindi)
	3. Press Correspondents, Dainik Jagran (Hindi)
	4. Press Correspondent, Amar Ujala (Hindi)
	5. Press Correspondent, Hari Bhumi (Hindi).

1.2 SELECTION OF STAKEHOLDER (LIST OF INVITEES)

Deputy Commissioner, Mahendergarh
Additional Deputy Commissioner, Mahendergarh
Sub Divisional Magistrate, Narnaul
District Development and Planning Officer, Mahendergarh
District Public Relations Officer (DPRO), Mahendergarh
Block Development and Panchayat Officer, Narnaul
General Managers, Industries, District Mahendergarh.
Village Panchayat Sarpanchs, Mahendergarh (list separately enclosed)

(1) Ministry of Railways

1 Station Master, Narnaul
2 Station Staff

(2) Traders

1 Charu Chilled Water Suppliers, Narnaul
2 Sanjeev Hard wares Ltd
3 Messers ACC Cement Suppliers
4 President Grain Market, Narnaul

(2) Media

1 Press Correspondent, Punjab Kesari (Hindi)
2 Press Correspondents, Dainik Jagran (Hindi)
3 Press Correspondents, Dainik Bhaskar (Hindi)
4 Press Correspondents, Amar Ujala (Hindi)
5 Press Correspondents, Hari Bhumi (Hindi)

2.1 METHOD OF SELECTION OF STAKEHOLDERS

The latest version of JICA Guidelines for Environment and Social Consideration has been developed in 2004 so that JICA funded feasibility study incorporates due consideration of the environmental protection and safeguards the sectors of society directly or indirectly affected by the project. Current feasibility study is carried out applying this guideline.

In order to encourage participation of the local residents, Stakeholder/ Public Disclose information on project for open discussion.

Disseminate information to the lowest possible hierarchy of the social system.

Obtain interaction of the participants of Stakeholder/Public Consultation Meetings.

Reflect the valid comments elicited from the open discussions to the design of the project.

Build a consensus on the project implementation and associated factors.

There are three stages of Stakeholder and Public Consultation Meetings. The first stage of Stakeholder/Public Consultation Meeting is held on state level, followed by second stage of Stakeholder/ Public Consultation Meeting held in the districts, and the third stage of stakeholder/ public consultation meeting is held in the villages directly affected by the project.

Institute for Spatial Planning and Environment Research (ISPER) in consultation with Mantec Consultants Pvt. Ltd has already organized first stage of Stakeholder/Public Consultation Meeting in the state of Haryana.

To organize the second and third stage of Stakeholder/ Public Consultation Meeting Mantec consultants has authorized " 'Institute for Spatial Planning and Environment Research' (ISPER), to meet the concerned government authorities and collect relevant data for carrying forward the social environment study and organize second and third stage of Stakeholder/Public Consultation Meeting for information dissemination about the project. As per direction of the guidelines for conducting the 2nd stage of the Stakeholder/ Public Consultation Meetings a formal order of the Ministry of Railways was got issued vide their letter dated 01-06-07 to facilitate these meetings .

Further, continuous efforts were made to keep the Ministry of Railways involved in the project as the major stakeholder through their local set-up. Rehabilitation Commissioners were also appointed from the state government departments. State Government Departments were also apprised and approached and were invited to participate in the Stakeholders/Public Consultation Meetings.

ISPER meeting facilitator team visited all the affected villages and requested Primary and Secondary Stakeholders to attend the meeting. Our meeting facilitator team preferred to invite the people who are likely to be affected directly by this project. Our team also met and informed the district administration and requested to help in organizing the public meeting successfully. Local stakeholders along the railway line, affected farmers, businessmen, private service and Govt. service employees were invited in the meeting. Our study team also contacted Panchayat Samiti Pramukhs, Gram Pradhan, and project affected persons and requested them to attend the meeting and also gave necessary support in conducting third stage of Stakeholder/Public Consultation Meeting. The main objective of the third stage of Stakeholder/Public Consultation Meeting is to disseminate the general information to public of the project affected villages. In Haryana State two districts are being affected by the proposed dedicated freight corridor project. Not only that our meeting facilitator team visited all the affected villages and requested primary and secondary Stakeholder to attend the meeting.

Stratified random sampling method was also used for the selection of Stakeholders because limited people had to be invited. Our meeting facilitator team also took consideration while extending invitations that vulnerable group of affected area should definitely be present in the meeting.

Stakeholders /Public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project. The third public consultation meeting for Mahendergarh district of Haryana state was conducted at Panchayat Bhawan, Narnaul on 07-07-2007 under the chairmanship of Deputy Commissioner, Sh M.P.Bansal (IAS), Narnaul. Other dignitaries participating in the meeting were Sh. PC Meena(IAS), Sub Divisional Magistrate, District Development and Panchayat Officer (DDPO), District Public Relations Officer (DPRO), local industrialists, traders and educationists and other district level officials.

It is noted here that the total freight rail line is about 46.5 km in Mahendergarh district. As per the existing norms, 24M strip of land in east direction from the middle of existing rail line will be occupied. The project-affected families (PAFs) would be properly compensated, rehabilitated and resettled as per the National Rehabilitation Policy, 2006. Although, this freight rail line will pass through many villages. However, the severely affected villages on this proposed freight rail link in the district are Pavera, Narnaul (near railway station), Uninda, Mali Tibba Mohalla of Narnaul, Napla, Ganiyar, Bajar and Sahupur Doyam.

2.2 SELECTION OF MEETING FACILITATOR

Simultaneously extensive surveys were conducted for the identification of suitable local agencies for the successful organization of the third stage of Stakeholders/Public Consultation Meetings. Preference was given to appoint Non Government Organizations (NGO) who had local presence, popularity and experience of social and public works. It has to be well acquainted with multifarious cross section of society to help in the selection of the right type of stakeholders for the meetings as well as for facilitating other related activities. i.e.

- Venue for the meetings
- Arrangement to be made;
- Assisting in local publicity;
- Invitation to the Stakeholders and motivating them for participation;
- Maintaining and compilation of record and feed back; and

- Other local arrangements like transport, hospitality, security and smooth conduct of the meeting proceedings.

The NGO 'Institute for Spatial Planning and Environment Research, India' was appointed for facilitating the third stage of Stakeholder and Public Consultation meeting, socio-economic survey and village level meeting.

2.3 METHOD OF INFORMATION DISSEMINATION

1) Method of notifying the meeting to the Participants

There were three methods adopted for informing the participants about 3rd public consultation meeting. In the First method our Team fixed the meetings at a particular venue with all the Village Sarpanchs of project affected villages. Village Sarpanchs were also requested to inform other likely to be affected persons and attend the meetings. ISPER team announced the date and venue of 3rd public consultation meeting in all such villages gatherings congregated in project affected villages. Hence, meeting facilitator team visited all the villages located along the existing railway line in the district and briefed up about this freight rail link to the villagers and role of Public consultation meeting in the execution of this project. Meeting facilitator team also disseminated the reports of the second public consultation meeting held at Panchayat Bhawan, Narnaul on 07-08-2007.

In second attempt, our organization also sought the help of government machinery for inviting the project-affected families of all project affected villages. An official letter was routed through Deputy Commissioner to District Development and Panchayat officer (DDPO) to invite the village Panchayat Sarpanchs of all project affected villages to participate in the meeting. The same notification was also issued to General Manager, Industries and other stakeholders to participate the meeting and propose their suggestions.

In third attempt, our team also made a close correspondence with local media personnel and disseminated a lot of information about the relevance of stakeholders meetings. Our team also displayed banners and relevant handouts showing major features of the project and DFC alignment passing through the Rewari district.

2) Presentation of the meeting

Presentation of meeting material supplied by Mantec Consultants was displayed and distributed among the stakeholders.

2.4 VENUE OF STAKEHOLDER/ PUBLIC CONSULTATION MEETING

Panchayat Bhawan, Narnaul on 07-07-2007

A) List of Participants

1 Deputy Commissioner, Mahendergarh
2 Additional Deputy Commissioner, Mahendergarh
3 Sub Divisional Magistrate, Narnaul
4 District Development and Planning Officer, Mahendergarh
5 District Public Relations Officer (DPRO), Mahendergarh
6 Block Development and Panchayat Officer, Narnaul
7 General Managers, Industries, District Mahendergarh.
8 Environmental specialist, (JICA Representative).
9 Sociologist, Mantec Consultants, New Delhi.
10 G.M Dedicated Freight Corridor Corporation India Ltd.
11 Village Panchayat Sarpanchs, Mahendergarh (list separately enclosed)

3.1 DETAILS OF STAKEHOLDER AND PUBLIC CONSULTATION MEETING

Stakeholders /public consultation meeting is a bottom up approach in this gigantic freight corridor project. It is one of the tools to reflect the views of the general public as well as those concerned with the project ranging from the central and local government organizations to commercial and industrial sectors of the society as a whole. It is an important tool of information dissemination during the planning stage of the project.

3.2 MINUTES OF THE MEETING

The public consultation meeting started at the scheduled time. The minutes of the meeting are detailed out as follows:

11.00 A.M to 11.10 A.M.: The public consultation meeting started at 11.00 A.M. Deputy Commissioner, IAS, came at 11.00 A.M. IAS, Sub-Divisional Magistrate, Narnaul also accompanied DC Mahendergarh. The organizers of meeting showed proposed freight rail alignment and list of affected villages displayed outside the meeting hall to the Deputy Commissioner and other dignitaries. The Deputy Commissioner inaugurated the stakeholders meeting.

11.10 A.M. to 11.20 A.M: Meeting Facilitator, Leader, Institute for Spatial Planning and Environment Research made a welcome address and briefed the role and purpose of 3rd public consultation meeting to the participants. He introduced Socio-economic expert of Mantec Consultants to the chief guest and other participants.

11.20 A.M to 11.50 A.M: Socio-economic expert, Mantec Consultants made his presentation on the objectives and features of dedicated freight corridor project. He dwelled upon each

component of the DFC and displayed the drawings of affected villages to the participants of project affected villages. Participants showed keen interest in the presentation.

11.50 A.M. to 12.20 P.M: General Manager, DFCCIL, dwelled upon the various issues including engineering aspects of proposed dedicated freight corridor project. He also made it clear that this project will reduce the pressure on road sector and there will be improvement in timings of passenger trains.

12.20 P.M to 1.00 P.M: During the interactive session, many pertinent issues were raised by the project affected persons. This continued during and after the presentation made by Socio-economic expert, Mantec Consultants. During the interactive session, a lot of discussion took place among the primary stakeholders, administrators, local politicians, traders, educationists, media persons and organizers of the meeting. The questions/answers and suggestions are recorded separately.

1.00 P.M. to 1.05 P.M: IAS, Sub-Divisional Magistrate, Narnaul in his presidential remarks informed the public that DFC project has many dimensions and likely to generate better employment opportunities both at the regional and national level. He also informed the public that local people would harness best benefits if some cargo handling yards and a freight rail station is opened at Atelli Mandi or Narnaul. He also appreciated the efforts of Institute for Spatial Planning and Environment Research for organizing such a successful meetings for the larger interest of the society.

1.05 P.M. to 1.20 P.M: A press conference was organized and local press reporters sought information about the project. The press reporting is enclosed at the end of the report.

1.20 P.M. to.1.25 P.M: Meeting Organizer proposed a vote of thanks to the chair and meeting ended with cheers.

3.3 PROFILE DESCRIPTION OF PARTICIPANTS

The major observations of Stakeholders/Public consultation meeting held at Narnaul on 07-07-2007 recorded through questionnaires are as follows:

Table 1 Distribution of Respondents by Village

S.no	Name of village	Total respondents
1	Atali Mandi	3(4.41)
2	Bachhod	6(8.82)
3	Bajar	2(2.94)
4	Begpur	2(2.94)
5	Chandpura	1(1.47)
6	Chilara	1(1.47)
7	Deranunela	1(1.47)
8	Ganiyar	1(1.47)
9	Napla	5(7.35)
10	Nareri	2(2.94)
11	Narnaul	29(42.65)
12	Nigarpur	1(1.47)
13	Patekra	2(2.94)
14	Tajpur	1(1.47)
15	Talot	2(2.95)
16	Tobara	1(1.47)
17	Uninda	8(11.77)
	Total	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 1 reveals that there were sixty eight respondents, natives of seventeen villages, participating in the public consultation meeting on dedicated freight corridor project. It indicates the wider representation of village Sarpanchs and other invitees. The Narnaul village has shown the highest representation, which accounts almost half (42.65%) of total participants. The Uninda village has shown more than one-tenth (11.77 %) of total participants. The Napla and Bachhod, which are likely to be affected, have also shown considerable participation in the meeting. Interestingly, other than this there are also respondents from 13 more villages who have showed their active participation in the third public consultation meeting.

Table 2 Distribution of Participants by Caste

Scheduled Caste	Other Backward Class	General	Total
3(4.41)	45(66.18)	20(29.41)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

There are no scheduled tribes in Haryana state as per Census of India. The representation of Other Backward castes was the highest i.e. 45(66.18%). The data show that nearly one third participants were from general category. The study reveals that the representation of scheduled castes has been very low (4.41%) in the public consultation meeting.

Table 3 Distribution of Participants by Family Size

Less Than 4	Less Than 6	More Than 6	Total
3(4.41)	23(33.82)	42(61.77)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

The table 3 brings out that the family size varies from less than four persons to more than six persons in Mahendergarh district. The respondents having small family size i.e. less than 4 persons have only one twentieth of participation. The respondents having moderate (i.e. less than 6 persons) family size have witnessed moderate participation that constitutes about one-third of total respondents. Participants having large family size i.e. more than 6 persons have shown about 61.77 per cent of participation.

Table 4 Distribution of Participants by Origin and Numeric Strength

Native	Non-Native/Migrated	Total	Majority	Minority	Total
67(98.52)	1(1.48)	68(100.00)	45(66.18)	23(33.82)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

The table 4 reveals that 98.52 percent of the respondents are original inhabitants of the region while 1.48 per cent is non-native/migrated from other place. It is also evident that about two-third of the respondents stated the majority of their caste/community in different villages of the district whereas, little more than one-third of the participants owe their origin to the minority segment of the society.

Table 5 Distribution of Participants by Literacy Status

Literate	Illiterate	Total
61(89.70)	7(10.30)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 5 indicates that majority of the people participating in the public consultation meeting were literate. It is more evident from the fact that about 89.70 per cent of total respondents were literate. The highest literacy among the participants may be attributed to old educational institutions available in the region.

Table 6 Distribution of Participants by Level of Education

Under Metric	Matric	Graduate	Other Professional Qualification	Illiterate	Total
23(33.82)	24(35.29)	12(17.65)	2(2.95)	7(10.29)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 6 shows the distribution of participants by level of educational attainments. The level of educational attainment could be taken as an indicator of social development of any region. The statistics indicates that the proportion of respondents at the below matriculation level has been about 33.82 per cent. The highest proportions (35.29%) of respondents have observed as matriculates. However 17.65 per cent of total respondents have reported as graduates. Little more than one –tenth of total respondents have enumerated as illiterate. Other than this 2.95 per cent of the respondents trained in vocational and other job-oriented courses. It shows that public consultation meeting has participated by aware and educated people of the area.

Table 7 Distributions of Participants by Occupation

Agriculture	Private Service	Govt. Service	Business	Total
20(29.41)	21(30.89)	13(19.11)	14(20.59)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 7 depicts the distribution of participants of stakeholders meeting by occupation. It is evident that highest proportion (30.89 %) of the respondents is involved in private services. About 29.41 per cent and 19.11 per cent respondents are engaged primary activities (particularly in agriculture) and government services. The proportion of the respondents earning their livelihood from Business is minimum (20.59 per cent) in the area.

Table 8 Distributions of Participants by Level of Yearly Income (Rs.)

Less Than 25,000	25,000 –50,000	50,000-1,00,000	Above 1,00,000	Comments Declined	Total
35(51.47)	22(32.36)	3(4.41)	3(4.41)	5(7.35)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

The table 8 shows the distribution of participants by level of annual household income. Considering the range of income of the respondents, the entire population has been divided

into four categories. The data reveals that the level of annual household income varies from less than rupees 25,000 to more than rupees 1, 00,000 in the region. The highest proportion of the participants falling less than 25,000 category is about 51.47 per cent. The proportion of households earning more than one lakh in a year is about one-twentieth of total respondents.

Table 9 Distribution of Respondents by Location

ROW	Diversion Line	ROB	RUB	Parallel to Rail Line	Total
65(95.59)	3(4.41)	Nil	Nil	Nil	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 9 brings out that majority of participants have their settlements and agricultural land along the existing rail line. It is noted that row of way (ROW) has also not been occupied illegally by the squatters or migrants and local villagers as well. Hence, 95.59 per cent of the project-affected families have their settlements and other physical property parallel to the railway line.

Table 10 Distribution of Participants by Impact

Significant	Relatively Significant	Insignificant	Negligible	Total
39(57.35)	8(11.77)	19(27.94)	2(2.94)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 10 reveals that majority (57.35 per cent) of the respondents feel that dedicated freight corridor project will exercise significant impact on them. The significance level has been assessed in terms of the guidelines given in questionnaires. About one forth and one tenth participants are likely to experience insignificant and relatively significant impacts due to this project. The proportion of participants having negligible impact on their livelihood is only 2.94 per cent of the total participants.

Table 11 Distribution of Respondents by Type of Impact

Loss of land	Loss of Occupation	Loss of Livelihood	Others	Total
34(50.00)	8(11.76)	35(51.47)	1(1.47)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 11 points out that 50 per cent participants are likely to loose their agricultural land and land put to non agricultural uses which include courtyard, open cattle shed etc. About one

tenth of participants feel that they will lose their main occupation due to this freight rail link. About 51.47 per cent of the respondents will have negative impact on their livelihood. Only 1.47 percent of the participants will face lose in terms of tube wells, houses, cattle sheds etc. Hence the study shows that the DFC is likely to exercise negative impacts on land, occupation and other sources of livelihoods.

Table 12 Distributions of Respondents by Compensation Desired

Land	Cash	House	Occupation	Land and House	Land and Cash	Cash and House	Total
15(22.05)	28(41.17)	12(17.65)	5(7.36)	3(4.41)	3(4.41)	2(2.95)	68(100.00)

Note: Figures in parentheses show the percentage to total respondents

Table 12 shows that 22.05% of total participants want land in lieu of their agricultural land and utmost 41.17% of respondents have posed faith in monetary compensation. About 17.65% of participants stated that they should be properly re-settled at places of their choices. Less than one tenth per cent of the total respondents need compensation as occupation, land and house, land and cash and cash and house.

3.4 QUESTION- ANSWER SESSION

During the interactive session of the 3rd public consultation meeting a lot of discussion took place among stakeholders, administrators, local politicians, transport union leaders, media persons and organizers of the meeting. The major issues that emerged during the discussions and suggestions regarding dedicated freight corridor (DFC) together are enumerated as under:

Q-1 President District Petrol Pump Association, Narnaul, “what are the current government rates of land in Haryana”?

Ans-1 The Government of Haryana has fixed Rs. 8 lac per acre of land irrespective of class plus 30 % solatium and 12.5 % interest under compulsory land acquisition.

Q-2 “what are the causes of the frequent changes in proposed width of railway line”?

Ans-2 General Manager, DFCCIL replied that it is a big magnitude project involving worth crores of investment. Right now it is in the planning stage and all the engineering specifications are supposed to take place at this stage only. Hence, it is not still clear some other changes are also possible in the future.

Q-3 “what are the provisions for noise pollution and vibration problems”?

Ans-3 In response it was told that the present freight rail link is being planned and executed by Japanese assistance and modern Japanese technology will be employed in this project.

Hence, regarding the noise pollution and vibration modern sound absorbing equipments would be installed and there would be no such problems.

Q-4 Pradhan of Industrial Association, Narnaul "Mahendergarh is an industrially backward region. Hence, it should be provided with Cargo handling station either at Nizampur or Narnaul instead of Rewari.

Ans-4 These stations are being proposed at particular distances. It was also made clear that one station is proposed at Harinagar, Rewari hence, it would not be feasible to construct the freight station in Mahendergarh district.

Q-5 A villager asked "what would be the compensation for those occupying land and house but lacking documents since last 50 years"?

Ans-5 In reply it was told that if they have constructed the house themselves they would get the compensation for the same but not for the land.

Q-6 A villager told that his entire house, shops and tube well is falling under proposed DFC. What is the compensation being provided to his family?

Ans-6 The compensation would be decided by Ministry of Railways as per National Rehabilitation Policy (NPR) 2003 and if approved then by NPR (2006).

Q-7 A villager asked "we should be given land rates at par with Gurgaon Urbanisable area".

Ans-7 The compensation would be finalized by National Rehabilitation Policy (NPR) 2003 and if approved then by NPR (2006).

3.5 SUGGESTIONS

Table 13 Percentages of Participants by Suggestions

S No	Total Participants
A	15(22.05)
B	3(4.41)
C	3(4.41)
D	21(30.88)
E	5(7.35)
F	2(2.94)
G	2(2.94)
H	2(2.94)
I	16(23.52)
J	1(1.47)
K	7(10.29)
L	2(2.94)
Total	68 (100.00)

Note: Figures in parentheses show the percentage to total respondents

A. Rail Bridge and Crossing Gate; B. Control on Vibration and Noise Pollution; C. Proper Safety Measures D. Comments Declined; E. Bridge near Purani Mandi, School or Village; F.

Provision of Container Depot in Narnaul; G. Provision of Cross Drainage; H. Good Project to Us (Public);I. Employment to Family Members; J. House to needy person and K. Land and Cash; L. Geological Survey

Table 13 indicates that nearly one-fourth of total participants want that crossing gates and Rail Bridge must be constructed near their settlements. About 4.41 per cent participants feel that the high speed of freight train could enhance noise pollution in the area hence there should be proper arrangement of vibration and noise controlling measures and same per cent of respondents also having the opinion that there should be proper security measures with in the corridor, as there are chances of accidents of animals and human beings. For villagers convenience about 7.35 percent of the total respondents are having the view that Bridge should be either nearer to Purani mandi, School or village. Enormous per cent (23.52%) of the total respondents need employment for family members to secure their future. The other suggestions proposed at the public consultation meeting include Provision of Container Depot in Narnaul, cross drainage under the railway line, house to needies, compensation by cash or Land and Geological survey before laying down of railway line.

3.5 SUMMARY OF MAJOR FINDING

About Sixty eight respondents of seventeen villages participated in the public consultation meeting. The representation of public has almost same with little variations ranging between 1 person to highest 29 persons in the whole villages. The Narnaul village has shown the highest participation. . People of Other Backward class were the (66.18 percent) representatives in the meeting. The respondents having large (i.e. more than 6 persons) family size have registered highest (61.77 percent) participation in the meeting. The analysis reveals that all the respondents are original inhabitants. The meeting was participated by literate persons. Nearer to 90 per cent of respondents were enumerated as literates. The highest proportion (35.29 percent) of respondents participating in the meeting has observed matriculates. The participation of graduates has observed 17.65% 0f total respondents.

It is discovered that nearly one third per cent of the total respondents are engaged in private services yet majority of household having annual income less than Rs. 25,000. It is investigated that about 70 per cent participants are not satisfied with the existing railways facilities for the physical movement of goods. It is gratifying to note that that 30 per cent of respondents are in favor of this multi modal dedicated freight corridor. The growing awareness among the respondents towards national interests is evident from the fact that majority of the participants are in agreement to leave their land and property to fulfill the requirement of DFC project. They also said that Govt. should provide them appropriate compensation.