ECONOMIC DEVELOPMENT AND LAND USE *
A REGIONAL PERSPECTIVE

From: Dr. Anjali Kulkarni
Reader in Economics
Nagpur University,
Nagpur. (M.S) (India)

INTRODUCTION

Economic development is associated with industrialization, urbanization and modernization. This process of industrialization may bring about change in the land use from traditional sustainable to modern non-sustainable use. This diversion of land may deprive the village communities of their traditional source of livelihood. The relentless transformation of the natural world into the world of artifacts, brought out so vividly for us by the process of modernization, industrialization, urbanization has most asymmetric implications for the different constituents of the Indian Society. For the many who earn barely enough to fill their bellies, there is little left over to acquire the new modern goods on the market whose production has been made possible by acquisition of land from their traditional use for the construction of factories. Such ecosystem people (Raymond Dasmann 1988) depend on the natural environment of their own locality to meet most of their material needs. As the natural world recedes (in the present case land with traditional use) it leads to shrinking of the capacities of local ecosystems to support these people.

The beneficiaries of economic development the biosphere people-enjoy the produce of entire biosphere, in contrast to the ecosystem people, who have a very limited resource catchment. Devouring everything produced all over the earth, the beneficiaries may be termed as omnivores. (Gadgil, Guha 2000)

1) A paper to be presented at Second IASCP Pacific Regional Meeting to beheld at Brisbane, Australia from 7th to 9th Sept. 2003.

2) The author is thankful to Shri Athawale, Chief Engineer MSEB (Generation) Dr. Khandewale (Prof. Economics) and Shri Inda Pawar (Reporter Sakal) for providing valuable information.

ABOUT THE PRESENT STUDY:

The present study discusses 4 case studies of land acquisition for industrial and commercial development of the Nagpur region. The first case study deals with the land acquired for Butibori MIDC area for industrial development of the region has transformed huge patches of land from its traditional use (cultivation) to modern use – i.e. industrial production 'commons' from these villages from where land acquisitions was made have been totally destroyed due to transfer of land for industrial use. However, the story of industrial development of Butibori industrial Area – with a status of Five Star MIDC facilities – and the biggest industrial estate in Asia – is far from satisfactory. The social cost of development of the land acquisition has turned out to be huge with adverse effects on employment status and income earnings in the post land acquisition scenario.

The second case study deals with land diversion for fly ash disposal. The history of thermal power station in Koradi Power generation at Nagpur has also diverted huge fertile land for depositing Fly Ash resulting from power generation. It is estimated that about 46,000 hectares of land in the periphery of Koradi Power generation will be diverted for non-sustainable use if use of flash ash to improve productivity of soil is not made properly. The recent research has shown favourable impact on agricultural production by proper utilization of fly ash along with other nutrients.

The third case study is of proposed International Air Port – Cargo Hub or MIHAN for which huge land would be acquired which is expected to generate benefits to the local communities through expansion of trade – commerce and industry. However the diversion of land (with village commons) for Cargo Hub has created protest and social conflicts among the locals, environmentalists and general public. Environmentalists claim huge social cost of this proposed international Cargo Hub project.

Other case study like open cast mining projects leading to noise pollution in the region, causing sinking water tables and health damages to the locals by deteriorating their quality of life have been briefly referred.

All these cases of land diversion have been briefly discussed to examine whether land diversion and resulting loss of production, income and destruction of the commons' has led to unsustainable development.

CASE STUDY 1

LAND DIVERSION AND INDUSTRIALISATION
A case study of Butibori, MIDC Area

There are three industrial estates in Nagpur i.e. Hingna, Kalmeshwar and Butibori. For accelerating the pace of industrial development, land was given to industrialists at highly subsidized rate along with other infrastructure facilities. Butibori Industrial Area is an ambition scheme taken up by the MIDC. It was expected to transform the resource rich; economically backward Vidarbha Region into a thriving center for industrial activity. This industrial estate biggest in Asia enjoying five star facilities is to given stimulus to industrialization of the Region creating employment and income earning opportunities Maharashtra Industries Development Corporation (MIDC) has planned to develop Butibori Industrial Area on 2312 hectares of land phase wise. Nearly 1500 hectares of land has been developed so far and 1456 number of plots are carved out; 849 no of plots are allotted to various entrepreneurs and 607 nos. of industrial and residential plots of various sizes are available for allotment. MIDC has also developed area of 270 hectares of land with five star facilities.

We conducted the survey of land outstees in Butibori MIDC area between December 1995 to January 1996. A list of project-affected people (PAP's) was acquired from MIDC. The survey covered 477 PAP families covering 71% of the total. The survey was conducted nearly 7 years, after the notification for establishment of the Butibori Industrial area. Hence several difficulties were encountered. The main difficulties were.

(1) There was no up-to-date list of PAP's and it was according to land holdings acquired. As such names of various PAP's were repeated if they had multiple land holdings.

(2) Many PAP's had migrated to nearby villages or other places and could not be traced at the time of survey.

(3) There was a general apathy among PAP's regarding the survey as they felt, that nothing concrete comes out of such surveys.

RESEARCH METHODOLOGY:

The survey was conducted at two stages viz, survey of PAP's and Survey of Industrial units. A pre-structured questionnaire was canvassed to PAP's to collect relevant information regarding their socio-economic status in pre and post land acquisition scenario. A separate questionnaire was canvassed to the industrialists and officials of MIDC who acquired land from MIDC to know the income and employment generating opportunities offered by them to PAP's in post land acquisition situation.

A personal interview technique was also used for the industrial estates officials of MIDC and land and house outstees (PAP's).

The village commons providing a perennial source of livelihood to the human as well as livestock population and offering a supplementary source of income to the village communities were also visited to examine the impact of their extinction on village communities.

Coverage: 18 villages which were affected due to acquisition of land were and covered to examine the impact on various socio economic variables.

MAJOR FINDINGS OF THE STUDY

The survey covered 477 PAP families, which had total 2477 members including the heads of the family.

Occupational Distribution: The survey revealed major occupation of the PAP's as cultivators or agricultural labourers (49% as cultivators and 25.4% as agricultural labourers) Thus, almost 75% of the PAP's were found engaged in traditional activities connected with the agriculture. However, most of them were rendered landless and were also not absorbed in industries established in the industrial estate of Butibori due to lack of skill. The loss of employment was thus for almost 50% of previously employed members. At the time of survey, only 14 PAP's had secured industrial jobs in Butibori. Apart from loss of employment, loss of traditional occupation is very traumatic to the PAP's.

OPPORTUNITY COST OF BUTIBORI MIDC AREA.

The land outstees lost 85% irrigated and 61% non-irrigated land due to establishment of Butibori Industrial Estate. The fall in income from farming was more than the fall in the number of persons engaged in cultivation. This was mainly due to loss of irrigated land under cultivations.

The survey of PAP's shows that 1065 family members from PAP lost farming on a traditional source of livelihood. 277 PAP's were absorbed in other occupations. The average annual income from farming was Rs. 11,375. However 49 persons who could get employment as agricultural labourer witnessed a fall in their annual average income to Rs. 3763. Business, industry and service gave higher incomes in post industrial estate situation but gave employment to only fifty additional persons.

Diversion of land from its traditional use to non-traditional use could have been justified if most of the PAP's were absorbed in modern industries and the land acquired from the cultivators would have created enough employment and income opportunities. However, the state of affairs in Butibori is far from satisfactory. Many plots are still lying vacant.

The per hectare compensation on an average, paid by the MIDC was Rs. 35232.81 per hectare. Looking to the average productivity of land and income from agriculture, this compensation appears quite inadequate.

GAINS AMD LOSSES FROM INDUSTRIALIZATION AND URBANIZATION – BUTIBORI.

There are 26 large and medium scale units with fixed capital investment of Rs. 391.46 crores offering employment to locals to the tune of 4621 (Supervisors and Workers). The employment to non-locals is estimated at 4093 by these 25 units. There are 83 SSI units offering to employment to 155 people.

The loss of agriculture income could have been compensated for, if; industrial development in the region had created sufficient income and employment opportunities. However it is reported that more than almost 10% of the industries in Butibori Industries are either sick or closed for one reason or other. As has already been stated earlier 2346 hectors of land is acquired by MIDC, in Butibori however only 1494 hectors of area is developed in the industrial estate. Out of these only 898 have been allotted to the prospective entrepreneurs out of total plots are allotted (898) production on only 194 plots has commence (upto 31st March 2002) creating employment opportunities for 9500 people. Thus having transferred land for industrial development, only on 10% of the land (plots numbering 194 production activities has started). Remaining 90% of the plots have remain unutilise showing high social cost of development. Only 3 units of MIDC Butibori with employment of 21 people are reported to be sick upto 31st March 2001. Other industrial estates in the region are not exception to this. Various estimates of loss of industrial output and blocking of funds have been made in the industrial estate of Butibori as well as other industrial estates.

The social cost of such land diversion also needs to be estimated. Destruction of village commons and consequent loss of livelihood to village communities.

EXTENSION OF MIDC AREA IN BUTIBORI

Only recently under the extension programme of MIDC, additional land worth 1603 hectare has been acquired by the MIDC spreading over 10 villages i.e.. Borkhadi, Chincholi Chimnazari, Brahmani, Dhawalpeth, Dudha, Larsi,

Manjali, Navegao and Akola. 80% of the population of these villages is totally dependent on agriculture.

The list of villages and the land to be acquired from these villages is given in the following table.

Table 1.1

Land Acquisition under Extension Programme of MIDC

	Name of the village	Land acquisition (Hectares)
(1)	Borkhedi	42.14
(2)	Chincholi	38.96
(3)	Chimnazari	55.29
(4)	Brahmani	141.91
(5)	Dhawal peth	298.24
(6)	Dudha	401.44
(7)	Tarasi	245.04
(8)	Manjari	256.04
(9)	Navegao	152.82
(10)	Akola	19.59
	TOTAL	1603.5 hector OR 94133 acres

The probable loss of agricultural production consequent on the land acquisition would show a very high opportunity cost of land to the village communities.

CASE STUDY 2

THERMAL POWER GENERATION, FLY ASH AND LAND DIVERSION

Electrical energy is the basic input for an industry without which industrial growth in any state or nation may not be possible. Coal is undoubtedly a prime source in India to generate electrical energy. At present, about 55% of total electric power produced in India is obtained from thermal power stations

which convert coal into electric power and fly ash. The latter is its by-product, which poses problems for its disposal, as it is not used at present in other industries on large scale. Around 12-21 million tones of fly ash is produced every year (Fulekar and Dave, 1986) and about 0-35 m3 space is required to dump one tone of fly ash. Thus, enormous area of land is required to store this by-product of thermal power stations.

Coal having higher sulphur content such as bituminous coal gives acidic fly ash. But Indian coal is lower in sulphur and ash obtained is alkaline in nature in contrast to most of the European coals (Fulekar 1983). Thermal power plants in India do not use coal high in sulphur.

Physical, mineralogical and chemical Properties of fly ash depend on the composition of parent coal, conditions during coal combustion, efficiency of emission control devices, storage, handling of fly ash and climate. Fly ash in thermal power stations is transported as water slurry to long distances at ash funds. Fly ash there is bound to suffer physical and chemical weathering.

Presently fly ash in Indian is used for manufacture of cement, ceramics, filling of roads, low lands etc. but on a very small scale. Agriculture sector offers a vast scope for fly ash utilization in large amounts. This is because it is a multi-nutrient carrier and a soil conditioner: Good number of agricultural scientists have found beneficial effects of fly ash addition on crop growth as well as on soil properties (John 1967; Chang 1977. Giedroj 1980, Campbell 1983).

To feed teeming population, intensive cultivation of arable land has become a necessity Intensive cultivation impoverishes the soils of their nutrient reserve. To overcome this deterioration of our soils, fly ash use can play a very important role

A report on the research project on utilization of fly ash from thermal power stations in agriculture by D.B. Matle and Dr. D.R. Kene of Punjabrao Krishi Vidyapith (PKV) Nagpur show favourable impact of fly ash utilization on agricultural production.

PKV has conducted experiments at Agriculture College Nagpur with field testing . In all 32 experiments were conducted in a 6 km radius around Koradi Thermal Power Station (TPS) over a period of 4 years from 1990-91 to 1993-94 on crops commonly grown in the region.

They used fly ash quantity of 5 to 15 MT / Hectors with upto 50% reduction in fertilizers.

Their results show increased yield for the following crops.

Cotton – 26.18% Ground nut – 11.08%

Wheat – 17.88 to 20.14%

Rice – 14.85 to 22.29%

Sunflower – 10%

Tur – 16.07 to 21.1 %

Gram – 11,02 %

The research also shows fly ash as good soil conditioner and also helps in improving water holding capacity and other physical properties of soil, important for plant growth.

The minerals present in fly ash like potassium, Boron Calcium, Zink etc . improves the fertility of the land. Fly ash can be used as insecticides and if used along with Bio-waste, it significantly supplements the utility of chemical fertilizer.

The research also shows that pH values of soil improves, when used in pH acidic soil.

THERMAL POWER STATIONS IN MAHARASHTRA STATE

Maharashtra state since its formation made every effort to produce electric power to meet the ever increasing demand from vast industrial growth to usher into a new modern era of prosperity. Besides this, state government

has been keen to make electricity available to every village. In order to improve living standard and provide modern amenities villagers.

Maharashtra is rich in natural resources particularly the rivers and huge coal deposits which could be harnesses for generation of electric power to meet industrial and domestic energy requirements.

Electric power generated in Maharashtra falls under the following categories.

i Hydroelectric generation

ii. Thermal generation

a. By using coal and

b. By using gas

iii. Nuclear generation and

iv. by exploiting non conventional energy sources such as solar wind etc.

Contribution of each of the above sources towards electric power generated so far is outlined in table 1 given below :

Table 2.1

Electricity power generation from various sources in Maharashtra

Sources	Location of power plant	Electric power generated (MW)	Share of each type of power in total electric power generated
A Hydro-electric	1. Koyna	920	
Power	2. Eldarl	22.50	
	3. Valtarna	60	
	4. Bhatgar	16	
	5. Veer	9	14.93%
	6. Radhanagari	4.80	
	7. Bhandardhara	10	
	8. Palthan	12	

B. Thermal electric power			
a. By using coal as fuel	9. Bhusaval	482.50	
	10. Paras	92.50	
	11. Khaperkheda	220.00	75.55%
	12. Nasik	910	
	13. Parall (V)	690	
	14. Koradi	1100	
	15. Chandrapur	1840	
b. By using gas as fuel	16. Uran	672	9.52%
	Total energy production	7061.3	

It is thus, observed that 75.55% of the total electric power generated in the state comes from coal, considering the present rapid pace of industrialization in the state as well as adjoining other states which heavily depends on Maharashtra for their electric power supply, the importance of coal as a source of electric energy is not likely to be dislodged even in the wake of availability of natural gas.

FLY ASH PRODUCTION IN THERMAL POWER PLANTS

It is normally observed that both boon and bane usually occur intertwined together and this is more true in respect of coal as a source of fuel for electric power. When coal is burnt its chemical energy is converted into heat energy which is utilized to produce steam of high pressure and temperature and this super heated high pressure steam is utilized to drive generator producing electricity. It also yields ash commonly known as fly ash. This ash at present is like a sheer wasted product which involves problem for its disposal and storage. Storage of fly ash requires large chunks of land area available with the thermal power plants. The gravity of this problem can be well appreciated from the information given in table 2.

Table 2 : Area with thermal power plants under fly ash bunds

Sr No.	Thermal power plant location	Total area with plant (ha0	Area under ash bunds (ha)	Percent of total area under ash bunds
1.	Bhusaval	673	250	37.15
2.	Paras	80	29.23	36.53
3.	Nasik	472	150	31.78
4.	Parall (V)	781.19	445.10	56.98
5.	Koradi and Khaperkheda		815	
6.	Chandrapur	2166.7	805.7	37.19

It is thus observed that very large chunk of total area of the thermal power plants has to be left for storage of fly ash alone and presently available land for ash storage is expected to be useful for only 15 to 20 years. After this, fresh land will have to be acquired . Thus, this poses a perennlal problem of acquiring more and more arable land in future. This problem needs to be addressed on priority by finding out useful uses for this flyash.

LAND DIVERSION FOR FLY ASH DISPOSAL :

100 million tones of fly ash are generated by thermal power plants in India. Its use in agriculture is viewed as one of the prospective means of its large scale utilization. The flyashes of different power plants from Uttar Pradesh, Haryana, Delhi, Maharashtra, Karnataka, Tamil Nadu and West Bengal have been evaluated for their composition, effects on soil properties, yields and quality of produce. The ashes were characterized by coarse to fine texture with preponderance of silt sized separates, low bulk density good water holding capacity (40 to 70% V/V)

With consistently increasing number of coal fired plants, large scale generation of fly ash is presenting enormous disposal as well as environmental problems not only in India but in different parts of the world. Among various possibilities of recycling fly ash, it's use in agriculture as a soil

amendment and also as a source of plant nutrients have shown promising results.

However, the major problem associated with providing plant nutrition through fly ash is low availability of most of the nutrient elements in such materials despite their good occurrence with total amount.

Under this context, a series of studies was undertaken to adopt vermicomposting for degrading organic waste materials along with fly ash with the help of a specific group of earthworms and to assess the effect of this technology on nutrients management of agricultural soils. A study by Bhattacharya (2003) revealed vermicomposting to be an effective proposition for increasing efficiency of fly ash in providing nutrition to agricultural soils and in growing crops .

It is estimated that in Nagpur nearly 46,000 hectares of land including village commons may be needed by 2012 for Ash disposal if not utilized gainfully. Thus, diversion of land for fly ash disposal is going to be major challenge before Maharashtra State Electricity Board.

MSEB has framed the policy to utilize the entire ash by Sept 2014 in tune with National policy. No land shall be made available for ash disposal beyond Sept 2014 to the existing power stations.

CASE STUDY 3

DIVERSION OF LAND FOR CARGO HUB – AN INTERNATIONAL AIRPORT AT NAGPUR

A total area of 2935 Ha is covered in the master plan for the cargo hub. The Nagpur airport project envisages acquisition of close to 2300 hector of land. While formulating the Master plan for the project, it has been endeavored to avoid populated areas as far as possible to avoid problems of displacement of population. This would result in resettlement for a few communities currently occupying the land. It is estimated that population of around 8800 people. (Consisting of 2096 households) belonging to six villages (Shivangaon,

Telhara, Bhamti, Khapri, Chinchu bavay and Kalkuhi) would be either fully or partially affected out of this a population of around 4890 people (in 1252 families) would be fully affected involving housing structures and accordingly requiring resettlement. As per the techno Economic feasibility study an area of 63 hectors is being acquired separately to resettle around 1500 families .

The total investment in various works in MIHAN project area by agencies other than the MIHAN promoter has been estimated at Rs. 26000 Mn till 2035.

PROJECT REVENUES (CARGO HUB)

There are three broad categories of revenues viz. aeronautical non-aeronautical and airport centric activities.

Aeronautic Revenues arise from operation and landing at aircraft and cover Landing fee, Parking Fee, Passenger Fee, Cargo charges etc. These are usually charged from the airlines.

* Non – Aeronautic Revenue arise from lease / rental charges for the various concessions within the Terminal. They include essential services, concessions related to Air Transport and Commercial Concession in the Terminal. The commercial activities can generate revenues in two ways – rental charges on the space and revenue share with Franchises and sub-concessionaires.

* Airport Centric Revenue would be in the form of concession fee or lease rentals from the projects outside the airport proper but within MIAN project area : Land outside the airport would be leased out to third parties for developing specified. Business activities and rentals would be charged. These would include various facilities such as commercial centers for financial services and similar activities. Youth hostel, Five star hotel, Cargo center, Rail and truck terminal etc.

Revenue are assumed to accrue right from 2003 as corporatized operations would commence with the existing terminal building after refurbishing. The total airport revenue estimated over the years are indicated in Table 1.

In Table 1, for the base case scenario, the aeronautic tariffs are assumed as 90% of the prevailing. AAI tantt, as an airport marketing strategy. A shar e of FTT (foreign travel tax) of Rs. 50 per departing international passenger out of the total FTT & Rs. 500/- per passenger is assumed to accrue to the airport developer.

Table 3.1

Revenue Estimates of MIHAN

	2005	2010	2015	2025	2055
Aeronautical	181	589	1695	8381	29165
Non-aeronautical	120	317	747	2884	9742
Airport centric	94	525	1383	5561	13898
TOTAL	**395**	**1431**	**3825**	**16826**	**52805**

ECONOMIC AND FISCAL BENEFITS OF THE PROJECT :

For estimating the economic benefits the area under consideration of MIHAN project in Vidarbha region. Any measure of economic impact of MIHAN can be measured in terms of (1) value added or Gross Regional Product. (2) Increase in exports (3) Wealth creation (4) Employment creation (5) Increase in revenues from tourist.

The project is expected to generate economic impact of about Rs. 520 Billion till 2035 (average about Rs. 15,000 Mn per Annum) The impact could be as high as Rs. 216,000 Mn in 2035. Table 2 summaries net Economic Impact of this project.

Table 3.2

Economic and Fiscal Benefits of MIHAN (2002 Prices)

Cumulative Net Economic Value Added to the region	Rs. 522254 Million till 2035
Cumulative Additional Tourism Revenue	Rs. 52620 Million till 2035

due to MIHAN	
Cumulative Additional Exports due to MIHAN	Rs. 54000 Million till 2035
Employment generated in airport, allied activities and tourism	94000 Jobs by 2035
Average Employment generated in construction activity	1.6 Million man-days per annum
EIRR	33 %
Fiscal Benefits	
Cumulative fiscal benefits to State Government (sales tax, stamp duty, professional tax, turnover tax, etc.)	Rs. 10326 Million (till 2035)
Cumulative fiscal benefits to Central Government (Income Tax, excise duty, customs duty, airport taxes, etc.) with existing share of airport taxes	Rs. 31169 Million (till 2035)
Cumulative fiscal benefits to Central Government (income tax, excise duty, customs duty, airport taxes, etc.) with proposed share of airport taxes.	Rs. 21689 Million (till 2035)

FISCAL BENEFITS OF THE MISHAN PROJECT

The economic impact of the project would also lead to the fiscal benefits i.e. increase in government revenues. Two alternative scenario have been projected which gives fiscal benefits of Rs. 41496 millions at 2002 prices.

Total Fiscal benefits of Rs. 32015 million have been estimated by the alternate scenario.

Table 3 A, B summarizes Fiscal benefits till 2035.

Table 4 summarise both Economic and Fiscal benefits till 2035.

Table 3.3

Total Fiscal Benefits Till 2035 (2002 Prices)

Tax	Central Govt.	State Govt.	Total
Income Tax	17224		17224
Sales Tax		8766	8766
Excise Duty	1189		1189
Customs Duty	2150		2150
Airport Tax	10607		10607

Stamp Duty		1500	1500
Professional Taxes		60	60
Total (with existing air tax structure)	**31169**	**10326**	**41496**

Table 3.4

Estimation of Net Economic Value Added By MIHAN (2002 Prices)

Parameter	Upto year		
	2015	**2025**	**2035**
Cumulative investment in the core airport project (a)	16647	21915	25810
Cumulative investment in the airport area (including SEZ) (b)	10466	20092	25862
Cumulative total investment in the MIHAN area (c=a+b)	27113	42007	51672
Investment multiplier factor with a lag of one year (assumed) (d)	2	2	2
Cumulative total capital investment into Vidarbha (driven by MIHAN) with a lag of one year (e = C x d)	52614	81792	102953
Capital Output Ratio (assumed) (f)	4	4	4
Cumulative ecnomic benefits of the project (g = E (e/f)	110084	280364	524107
Annual Economic Costs of the Project (h)	56	56	56
Cumulative economic costs of the project (i = g – l)	109354	279072	522254
Average economic benefits per annum (k)	7811	11628	15360
Annual net economic benefits of the project in 2035 (I = e/f)		25738	

Table 3.5

Revenue Estimates for MIHAN

	2005	**2010**	**2015**	**2025**	**2035**
Aeronautical	181	589	1695	8381	29165
Non-aeronautical	120	317	747	2884	9742
Airport centric	94	525	1383	5561	13898
Total	395	1431	3825	16826	52805

Table 3.6

Capital Cost of The Project (at 2002 prices)

Classification	2002-06	2007-15	2016-25	2026-35	Total
Movement Area (Runways, etc.)	769	787	484	452	2,492
Terminal complex	3,208	2,210	3,443	2,743	11,604
Flight control	562	60	60	60	742
Utilities	275	125	135	144	679
Pre-operational, temporary works and tests	590	-	-	-	590
Contingencies	303	385	432	348	1,468
Design project supervision	146	92	92	84	414
MIHAN roads & infrastructure	800	735	400	64	1,999
Other MIHAN costs (rail, cargo, green belt, SEZ fence, etc.)	788	2	222	-	1,013
Contribution towards off site infrastructure	1,200	-	-	-	1,200
Reconstruction of shifted airforce building	150	-	-	-	150
Contribution to MRTS	-	1,000	-	-	1,000
Cost of taking over existing AAI assets	-	-	-	-	-
Land acquisition & resettlement	2,460	-	-	-	2,460
Total	**11,251**	**5,396**	**5,268**	**3,894**	**25,810**

Table 3.7

Air Cargo Traffic Forecast-Nagpur (in tons)

S No.	Year	2000	2005	2010	2015	2020	2025	2030	2035
A	Existing Domestic Cargo	830	1260	2066	3979	7661	13321	21846	30500
	Cargo on account of domestic hubbing		1699	2786	5364	10329	17960	29455	41300
	Possible transfer from Surface to Air (model diversion)		1125	1845	3552	6840	11894	19506	27500
A	Total Domestic		4084	6698	12895	24829	43175	70806	99300

	Cargo								
B	International								
	Possible transfer from Surface to Air (modal diversion)		3375	10785	20766	39982	69524	114020	154000
	Additional Cargo due to Value added exports		6857	11043	17786	28644	46131	74295	100000
	Diversion of Cargo on account of O-D Pattern		5307	9292	19091	28991	36311	45566	53500
	Diversion from other airports due to Congestion		5000	11100	23400	36360	63800	101300	136000
	Total international Cargo Potential		20539	42221	81042	133978	215766	335181	443500
	Expected % penetration on account of gradual development		20	50	85	100	100	100	100
C	(= Total potential x % penetration)	80	4108	21111	68886	133978	215766	335181	443500
D	International Hubbing Air Cargo		1000	25500	76600	149000	268000	465000	626900
E=A +C+ D	Grand Total Domestic +International Cargo	910	9192	53309	158381	307807	526941	870987	1169700

Table 3.8

Passengers Traffic Forecast-Nagpur (Figures in millions)

S No.	Year	2000	2005	2010	2015	2020	2025	2030	2035
	Domestic Passengers	0.2	0.27	0.42	0.71	1.2	1.85	2.7	3.8
	Domestic transit Pasengers		0.33	0.46	0.66	0.95	1.25	1.6	1.99
A	Total Domestic	0.2	0.6	0.88	1.37	2.15	3.1	4.3	5.79
	Passangers on O-D Consideration		0.2	0.28	0.34	0.42	0.5	0.62	0.7
	Charters – Haj		0.014	0.016	0.019	0.021	0.025	0.029	0.033
	Tourists		0.032	0.078	0.2	0.39	0.78	1.39	1.94
	Passenger diversion due to congestion		0.050	0.28	0.56	0.98	1,65	2.47	3.2
	Passengers international hubbing		0.025	0.4	1.0	1.87	3.22	5.4	7.2
B	Total International		0.32	1.05	2.12	3,68	6.18	9.9	13.1
D=A	Grand Total	0.2	0.92	1.93	3.5	5.83	9.28	14.2	18.9

+B									

Targeted Benefits of Cargo Hub

Particulars / Estimates	Employment potential		Estimated wealth generated in Rs. Crores
	Direct	**Indirect**	
Air Cargo, ICD Muthmodal Hub, Road Freight City, Railway freight station, Passenger Terminus	10	20	500
Distribution Rark, Duty free zone, Commercial Zone, Hotels, Shopping zone, Free Trade Port	10	20	400
Information Technology Park STP, R & Centres	16	30	80
Export processing zone Industrial Zone and Arcillary facilities	10	50	700
Total	45	120	2400
Investment estimated			Rs. 5000

Total land of 24 thousand acres will be acquired for the Cargo Hub is from 22 villages.

In the proposed Cargo Hub project, villages like Mauja, Shivangao, Bhamati, Jaytala, Kalkuhi, Telhara, Khapara will be affected due to acquisition of land. Apart from the above villages, 51 layouts have also been included in the proposed acquisition. The sanction for 25 layouts has already been given. Some portion of the layout falls within 572 layouts and some part falls in 1900 layouts which has been included in the proposed land acquisition.

It is claimed that the biggest airports in the world have been be constructed with 200-300 hectare of land and at a distance of 25-60 miles from the city. Tokyo Airport in Japan is at a distance of 120 miles. Canady Airport in New York (USA) is 40-45 km away from the city.

The proposed new International Airport at Mumbai (India) is also 100km away from the city.

Thus looking the International standards, Cargohub in Nagpur is very close to Nagpur city which will be hazardous to health.

ENVIRONMENTAL AND OTHER IMPLICATIONS OF THE PROPOSED PROJECT.

Establishment of International Air Ports require compliance with certain norms. All over the world, airports are being shifted to more than 25 miles (1.6 km = 1 mile) or every more than 50 to 60 miles from the city. International airport in Japan is 120 miles away from Tokyo city / Canady Airport in USA is 40 to 45 kms from the New York city New Airport in Mumbai is also planned 10 kms away from the city to minimize adverse impact pollution.

NOISE POLLUTION AND NOISE INDUCED HEARING LOSS

About 300 to 350 planes for every 5 minutes will be run daily on the route. Hearing loss is one of the most obvious and easily quantified effects of excessive exposure to noise. Its progression, however, is insidious, in that it usually develops slowly over a long period of time, and the impairment can reach the stage before an individual is aware of what has happened. While the losses are temporary at first, they become permanent after continued exposure, and there is no medical treatment to counteract the effect. When combined with presbycusis, hearing loss naturally occurring with the aging process, the result is a premature impairment that grows inexorably with age. According to the U.S. Public Health Service (PHS, 1991), some 10 million of the estimated 21 million Americans with hearing impairments owe their losses to noise exposure (as cited in Crney 1991). The study goes on to say that it is unclear whether the incidence of hearing impairment has risen in recent years because the necessary studies have not been conducted.

Annoyance can be viewed as the expression of negative feelings resulting from interference with activities, as well as disruption of one's peace of mind and the enjoyment of one's environment. Although this reaction can run the

gamut of mild irritation to extreme distress, only responses categorized as “highly annoyed” (and greater) have been used to measure the impact of noise on communities. The most respected and widely used criterion to asses community annoyance in the U.S. has been the Schultz curve, although this criterion has been the subject of heated debate. Several recent studies indicate that the Schultz curve underestimates annoyance due to aircraft noise and overestimates annoyance from the noise of urban traffic and trains, leading to the conclusion that annoyance from these categories should be assessed separately.

PEOPLE AFFECTED BY AVIATION FUEL

The millions of people worldwide who live within close proximity of an airport are affected by aviation fuel. A report produced by the Seattle-King Cournty Department of Public Health in 1997 compared residents of Georgetown, an area of Seattle which surrounds King County International Airport to King County which surrounds greater Seattle. When comparing hospitalization rates for Georgetown to those of King County Geogetown residents were found to have,

- a 57% higher asthma rate
- a 28% higher pneumonia / influenza rate
- a 26% higher respiratory disease rate
- an 83% higher pregnancy comlication rate
- a 50% higher infant mortality rate
- Higher rates of genetic diseases.

The average life expectancy was found to be 70.4 years in Georgetown a rate comparable to that of many developing countries whereas Seattle’s average life expectancy was 76.0 years. Mortality rates for all causes of death were found to be 48% higher in Georgotown compared to King Counties. These findings show alarming differences. However, a study has yet to show a

causative link between the pollution of aviation fuel and the higher mortality and morbidity rates found in the report produced by the Department of Public Health. This preliminary epidemiological study does seem to indicate the need for more specific research to be carried out regarding the toxicity of particles produced by the combustion of aviation fuel.

All these effects on health in case of Cargo hub in Nagpur needs to be given serious attention. Health hazards of land diversion for International airport is a major issue here.

OPPORTUNITY COST OF LAND (LOSS OF AGRICULTURAL PRODUCTION

The loss of agricultural Production from transfer of cultivated land from villages for the project can be estimated from the statistics of yield per hectare and output for the major crops in Nagpur district.

Table
Agricultural production and productivity of crops (2000-2002)
Nagpur District

Name of the crop	Yield per hectare (kg)	Total output (00M tone)
Rice	992	374
Wheat	1031	334
Jowar	805	462
Maize	1000	5
Total	1918	1175
Chana	483	129
Tur	619	302
Udid	500	13
Mug	407	11
Other pulses	367	29
Total pulses	546	484
Jawar	250	217
Ground nut	626	67
Til	333	2
Arandi	1000	1
Sugar cane	79	712

Cotton (Seedless)	151	631
Tobacco	1000	1
Total medicinal Products	1000	1
Chilli	186	33
Turmeric	941	95
Potato	3990	4

Even if one concentrates on output of food grains only, the estimated loss of food grains is 1,65,900 m tones for only one year. If these villages (under cargohub) account for 10% of the total output, their contribution in total output of the district may be estimated at 16590 m tones in 2001-2002. This may be a perpetual loss of food grains production for the village whose land is to be acquired for cargohub.

LAND DIVERSION FOR OPEN CAST MINES BY WCL IN CHANDRAPUR DISTRICT

Coal India Limited (CIL) a holding company for the nationalized coal mines, has seven subsidiaries under its fold. Western Coal fields Limited (WCL) is one of the subsidiaries of CIL and has undertaken several open cast mining project. Such projects are basis for industrial development. However their implementation and operation invariorly causes disturbance to the eco systems and the socio-economic fabric of the surrounding society. The land which is diverted for open cast mining projects bring with it infrastructural facilities and new avenues of employment / income and on the other hand project affected population loses its cultivable land at times residential houses and other immovable assets as also the means of livelihood. This kind of physical loss can be assessed and compensated with, but the sense of uprootment and socio-cultural braking away is difficult to estimate and compensate.

Most of the ‘commons’ surrounding the open cast mines in project affected villages have lost their utility which were a major source of livelihood to them. The sinking water tables is also a severe problem for the cultivators in

Chandrapur district (villages with 5-10 km of open cast mines). The noise pollution from the blast has also destroyed buildings in the nearby villages. The quality of life of the people around the open cast mines has significantly deteriorated due to incidents of some diseases like Tuber Culosis. (T.B) Thus land diversion to open cast mines, though created some benefits to the region in terms of generating income and employment opportunities has also been responsible for high social cost and unsustainable developments.

CONCLUSION

All these case studies show that diversion of land from traditional use to non traditional has though created some positive impact on economic development by generating income and employment opportunities, these developments have been found leading to non sustainable development of the region. They have destroyed, ‘ commons’ in villages thereby depriving the local communities of their basic means of livelihood.

Appendix Table 1.1 (A)

Land Acquisition for Butibori MIDC Area

	Name of the village	Tehsil	Land Acquired	No. of PAPs	Compensation (In Lacs) Rs.
1.	Umri	Hingna	139.12	54	41.10
2.	Bori	--"--	33.62	5	4.00
3.	Gangapur	--"--	118.92	39	34.00
4.	Khapa	--"--	189.73	94	56.00
5.	Turkumari	--"--	135.35	66	70.5
6.	Wateghat	--"--	137.83	61	41.57
7.	Tembhari	--"--	214.58	82	65.09
8.	Amgao	--"--	72.59	36	19.04
9.	Bridganeshpur	--"--	89.12	31	35.0
10.	Kinhi	--"--	74.26	37	33.8
11.	Mandava	--"--	189.94	77	55.4
12.	Sukali	--"--	22.00	9	6.09
13.	Kirmiti	--"--	89.57	23	31.96
14.	Pohi	--"--	379.88	124	113.9
15.	Rengapar	Nagpur (Rmai)	205.82	79	169.74
16.	Ruikheri	--"--	102.11	33	70.26
	16 Villages	2174.44	850	8.39	98011

Appendix Table 1.2 (A)

Land Acquisition for Five Star facilities at Butibori MIDC (1996)

	Name of the village	Tahsil	Acquisition of land
(1)	Chimnazari	Nagpur	55.29
(2)	Chincholi	Nagpur	43.32
(3)	Brahmani	Nagpur	99.22
(4)	Navegao	Nagpur	153.82
(5)	Dhawalpeth	Nagpur	252.22.9
(6)	Tarasi	Nagpur	239.55
(7)	Dudha	Nagpur	402.32
(8)	Mangali	Nagpur	234.82
(9)	Asola	Hingna	19.94
	Total		1500.50.9