Bharathidasan University

Programme: MSc Environmental Science and Sustainable Management

Course Title: ENVIRONMENTAL IMPACT ASSESSMENT
Course Code: 21PGCC04

Unit- III Preparing and Writing of Environmental Impact Statements (EIS)

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Acquisition of Primary data -2

3 Laboratory studies - Physical, chemical and biological nature of soil, water and air

4 Remote sensing - Landuse, landcover, geology, vegetation

Data processing

i) Computerized data storage

ii) Computerized data analysis -

a) to identify extreme values

b) to produce means, standard deviations, percentiles etc

c) to recognize trends in space and time

d) to make predictions

Presentation

The data collected during EIA is analyzed and presented in suitable forms in the report

Common graphical forms are;

i) Line diagrams

ii) Block diagrams

iii) Pie Charts

iv) Thematic maps etc

EIA Report - 1

The report consists of;

1 Project details

2 Objectives and scope of the study

3 Results of data analysis

a) Pre-project scenario

b) Construction phase scenario

c) Operation phase

EIA Report - 2

4 Salient findings on baseline characteristics

5 Analysis of the impacts during various phase including post-operation phase

6 Cost-benefit analysis of the project

7 Environmental Management Plan describing various mitigatory measures

8 Summary and conclusions

Stage 4: Public consultation/Hearing

- local affected persons and others who have plausible stake in the environmental impacts can address
- All Category 'A' and Category B1 projects or activities shall undertake Public Consultation
- public hearing at the site or in its close proximity-district wise, to be carried out in the manner prescribed in Appendix IV, for ascertaining concerns of local affected persons
- obtain responses in writing from other concerned persons having a plausible stake in the environmental aspects of the project

Stage 4: Public consultation/Hearing

- Public hearing shall be conducted by the State Pollution Control Board (SPCB)
  - forward proceedings to the regulatory authority concerned within 45 days
- If the public agency nominated reports that it is not possible to conduct the public hearing in a manner which will enable the views of the concerned local persons to be freely expressed
  - It shall report the facts in detail to the concerned regulatory authority

After public consultation…

- Applicant shall address all environmental concerns expressed during this process
- Make appropriate changes in the draft EIA
- Final EIA report shall be submitted by the applicant to the concerned regulatory authority for appraisal

Stage 4: Appraisal

- Detailed scrutiny by the EAC or SEAC of
  - documents like the Final EIA report
  - outcome of the public consultations including public hearing proceedings
  - submitted by the applicant to the regulatory authority concerned for grant of environmental clearance

- Appraisal of all projects or activities which are not required to undergo public consultation, or submit an Environment Impact Assessment report (Category B2) shall be carried out on the basis
  - prescribed application Form 1
  - Form 1A
  - any other relevant information

Stage 4: Appraisal

- EAC or SEAC shall
  - shall recommend to the regulatory authority concerned
    - either for grant of prior environmental clearance on stipulated terms and conditions
    - or rejection of the application for prior environmental clearance, together with reasons for the same.

Grant or Rejection of EC

- The regulatory authority shall consider the recommendations of the EAC or SEAC concerned and convey its decision to the applicant
- The regulatory authority shall normally accept the recommendations of the Expert Committees
- In cases where it disagrees with the recommendations of the Expert Committee (Central or State), the regulatory authority shall request reconsideration by the Central or State Expert Appraisal Committee
- After reconsideration, irrespective of views of Expert Committee, decision of the regulatory authority concerned shall be final

Grant or Rejection of EC

- If decision not granted within stipulated time, the applicant may proceed as if the environment clearance
- Deliberate concealment and/or submission of false or misleading information or data which is material to screening or scoping or appraisal or decision on the application shall make the application liable for rejection
- Rejection of an application or cancellation of a prior environmental clearance already granted shall be decided by the regulatory authority, after giving a personal hearing to the applicant, and following the principles of natural justice

Validity of Environmental Clearance

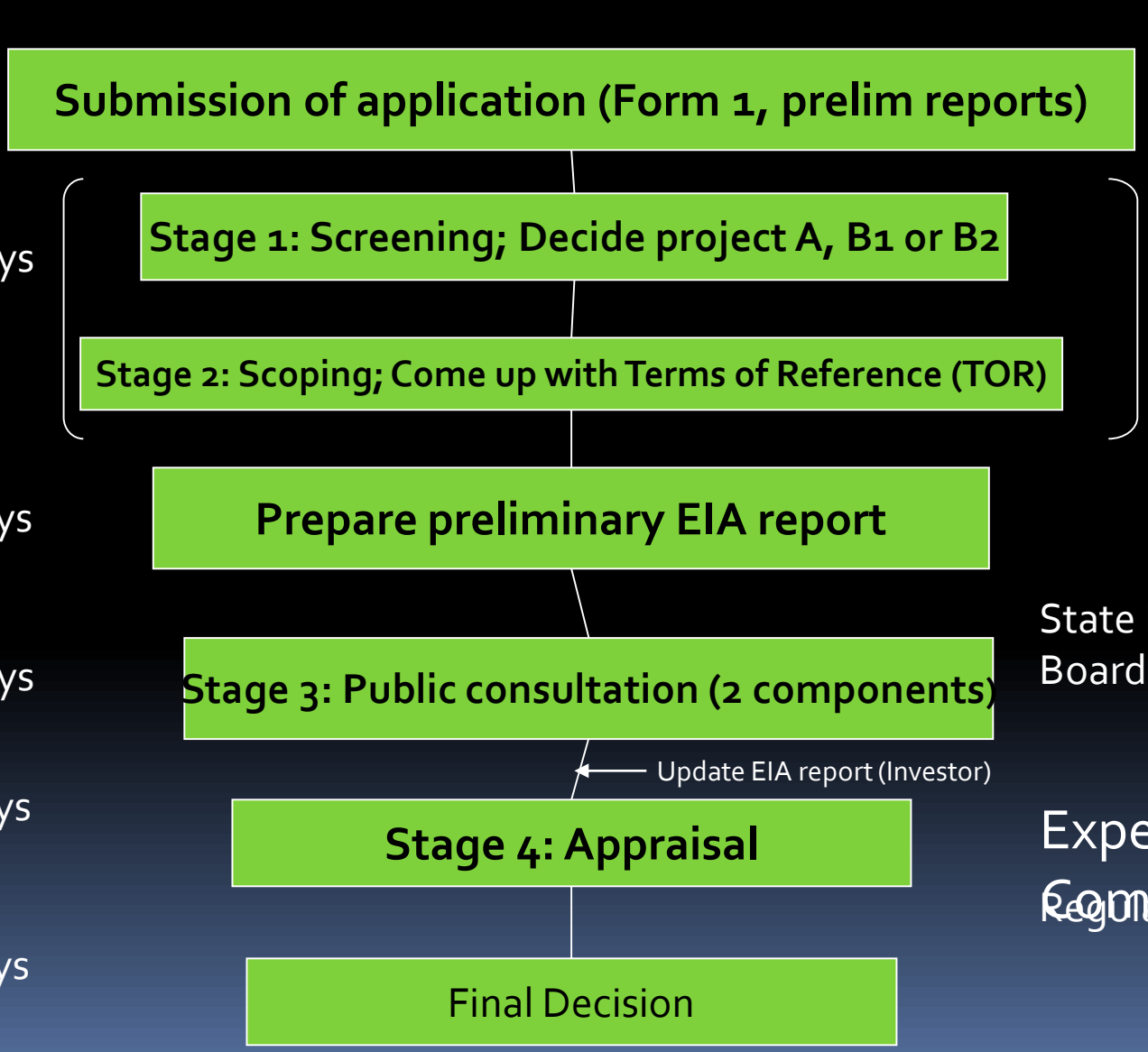
- Ten years in the case of River Valley projects
- Thirty years for mining projects
- Five years in the case of all other projects and activities
- Area Development projects and Townships, the validity period shall be limited only to such activities as may be the responsibility of the applicant as a developer

Post Environmental Clearance Monitoring

- Mandatory for the project management to submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms

Summary of EIA process and Rough Timelines

Who does it?



Immediate objectives of EIA

- Improve the environmental design of the proposal.
- Ensure that resources are used appropriately and efficiently.
- Identify appropriate measures for mitigating the potential impacts of the proposal.
- Facilitate informed decision making, including setting the environmental terms and conditions for implementing the proposal.

Long term objectives of EIA

- Protect human health and safety.
- Avoid irreversible changes and serious damages to the environment.
- Safeguard valued resources, natural areas and ecosystem components.
- • Enhance the social aspects of the proposal

Loopholes and deficiencies

- Stage 1 - Screening
  - Based on info (form 1, 1A) supplied by investor
- Stage 2 - Scoping
  - No public participation in scoping process -
  - Biased in securing favorable Terms of Reference (TOR) for investors
  - Access to TOR limited
- Stage 3 – Public consultation
  - Can be avoided if regulatory agency feels it difficult to conduct it owing to local situation
  - Other concerned persons having plausible stake shall submit responses only in writing

Loopholes and deficiencies

- Appraisal
  - No public participation
  - Arguments between regulatory authority and expert committee made known only to investor and not to public
  - Iron hand given to regulatory authority to make final decision – Expert committee opinion can be disregarded
  - Deemed Clearance: Incase decision is not given within the prescribed timelines, applicant may proceed as though clearance has been granted or denied

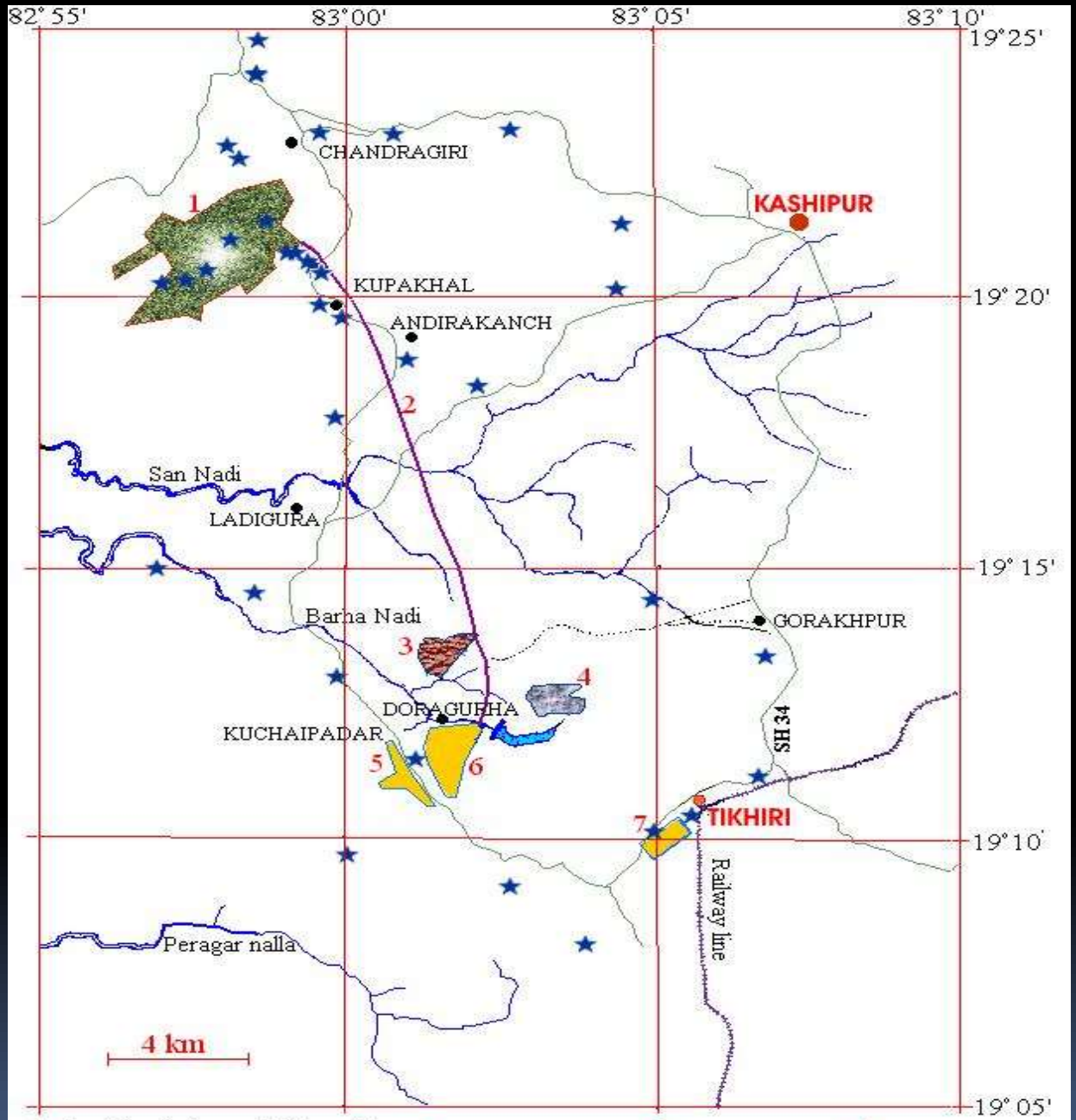
UTKAL ALUMINA INTERNATIONAL LIMITED, RAYAGADA, ORISSA

- The Utkal Alumina International Ltd (UAIL), is to set up an Alumina plant at Doragurha in the Kashipur block of the Rayagada district, Orissa. The plant envisages to utilize the bauxite deposit of Baphlimali plateau.
- A conveyor belt of approximately 20km connecting it with the mine at the Baphlimali plateau, facilities for red mud and ash disposal, road network, 12 km railway siding, airstrip and a township.

UTKAL Alumina

Mine Area

- About 200 million tons of bauxite
- Most of the plateau will be mined leaving aside a 15m barrier at the periphery (to check erosion from the mining site)
- administrative office,Work force of around 300 people.



1. Baphlimali plateau (Mining site) 2 Conveyor route 3 Redmud pond 4 Ash pond
5 Township 6 Plant area 7 Air strip ★ Sampling location

Figure 1 Map showing the project sites and the sampling locations

Conveyor belt

- A 20km long single flight overland conveyor with a design capacity of 950 tons/hr.

- The conveyor is upgradeable by enhancing the speed to 1525 tons/hr.
- The conveyor route would be protected by means of barbed wire fencing.
- A few crossovers at suitable points will be provided along the route for movement of local people and animals.

Alumina plant at Doragurha

- The bauxite plant is designed to operate on a continuous year round basis at production rate of one million tones per annum.
- The plant includes all facilities and infrastructure to process bauxite into metallurgical grade alumina
- Steam and power plants consist of three CFBC boilers and two steam turbines of 30 MW each
- Fuel used for the power and steam plant would be coal, estimated as 550,000 tons/annum

Red Mud and Ash Disposal

- The amount of mud residue generated by the plant would be about 3300 dry tons daily..

- Ash generated is recovered largely as fly ash. The ash is subsequently routed to a storage bin to the ash disposal area established at 5.5km north east of the plant by dumpers.
- Maximum daily ash disposal will be about 800 tonnes.

Road network and airstrip

- The proposed roads include a link road of 37km from Tikhiri via plant site to the mine top.
- This road will pass through villages such as Dongasil, Ladigurha and Kupakhal, and the water intake point at Katkhal.
- The airstrip is proposed at around 10km south east of the plant location. The airstrip would comprise a runway of 30m wide and 1100m long and a control tower for manual operation

Today

EIA GAIL PIPE LINE

Background

- GAIL proposes to lay an LPG pipeline connecting Mangalore, Bangalore, and Coimbatore for the transport of LPG.
- The pipeline route has a 'T' shape (Figure 1) Mangalore and Bangalore that pass through six districts of Karnataka
- A southward arm takes off from Hassan towards Coimbatore that pass two districts of Tamil Nadu (Erode and Coimbatore).
- The proposed route cuts across the Western Ghats south of the Charmadi Ghats.
- The elevational range of the pipeline route vary from a few meters over sea level in Mangalore to over 1128 m above MSL at Guttihalli saddle.
- The southward arm of the pipeline cuts across the Eastern Ghats along the Thalamalai-Gajalatti-Bhavanisagar forest area of Tamil Nadu.

Scope

- The scope of the study as per the terms of refernce are:
- Review of the project in the light of various Forest and Wildlife Protection Acts
- Assess the baseline data with respect to vegetation cover, habitats and fauna.
- Assessment of the baseline status of forests and associated wildlife of the area,
- Assessment of the impact of the proposed project on forest and wildlife,

Pipeline Route

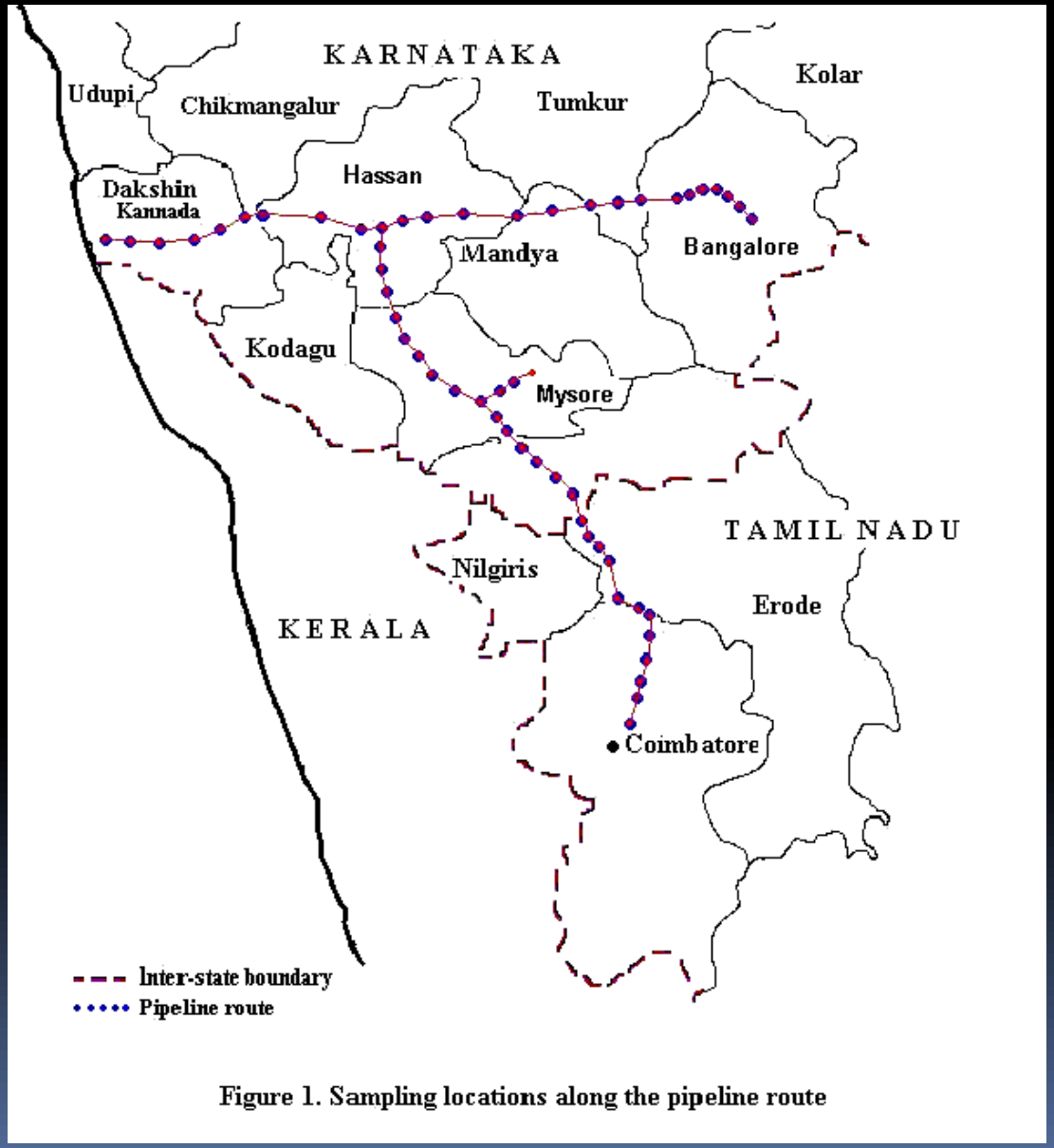


Figure 1. Sampling locations along the pipeline route

1. Different sectors of the pipeline

Sector	Region	Chainage (km)	Forest area chainage (km)
1	West of Western Ghats (Konkan region)	0 to 81*	71.2 to 73.7; 74.4 to 75.5; 76.2 to 78.8 (Total = 6.2 km)
2	Western Ghats	81-157*	96.6 to 97.5; 101.3 to 103.6 (Total = 3.2 km)
3	Hassan - Bangalore.	127-362*	-
4	Hassan - Mysore tap-off point	0 - 95	-
5	Mysore spurline	0-15	-
6	Mysore tap off point - Arulvadi	95 - 175	-
7	Tiganarai -Talamalai-Velamundi RF	175 - 232	182 - 190; 192- 193; 195-217; 228.8 - 229.8 (Total = 32 km)
8	Near Sastrigramam to Irugur	232 - 278	-

* Source: M/s HPCL

About the Project

- steel pipes will be laid in a meter deep trenches in the RoW to be acquired by GAIL.
- the width of the RoW as 20 m, the total area of the entire RoW is about 1340 ha.
- After placing the pipes the trenches are filled, covered and the land returned to the original owners.

Impacts

The creation of RoW can lead to various ecological problems

- invasion of exotic plants which may compete with the natural vegetation,
- loss of habitat for arboreal and air-borne species such as arboreal lizards, primates and birds,
- habitat fragmentation and loss of contiguity of natural areas would result in the loss of species and reducing bio-diversity and
- opening up comparatively inaccessible natural areas such as wild-lands to human activity.

Impacts

- A large number of trees, both wild and planted species, will be felled during the creation of RoW.
- In sector 1 the estimated number is about 16000 wild species and 40000 planted species.
- In sector 2, 15000 each of wild and planted species will be felled. In sector 3, 1800 and 2300 wild and planted trees will be felled.
- The total number of trees, occurring along the RoW, which will be felled in various pipeline sections for the project will be about 1,20,185

Conclusion

- About 82.8 ha of forest land will be converted for the RoW and compensatory afforestation by GAIL is mandatory as per the Forest Conservation Act (1980).
- In afforestation / tree planting programme preference should be given to local wild species of plants.
- In the ROW 20 species were listed in Schedule I and II of the Indian Wildlife Protection Act (1972).
- Twelve species that include nine Vulnerable and three endangered species are listed in the Red Data Book of the Zoological Survey India.
- Alternate route avoiding the Talaimalai reserve forest should be explored. The forest in the area is also a crucial wildlife corridor

Conclusion

- The major impact of the pipeline project is during the construction.
- During the operation phase the underground pipeline practically does not pose any threat to the local ecological make-up, except in case of accidents such as leakage which have low probability.
- All precautionary measures have to be taken regarding fire hazards as the Western and Eastern Ghats are known for man-induced fire during dry season
- Dry season (March - May) is advisable for construction in Sector 2 because primary breeding season for most of the resident birds commences with monsoon.
- In Sector 7 dry season may be avoided for construction, instead winter season may be suitable.
- Care should be taken not to erect any permanent barriers along the boundary of RoW which may hinder the free movement of animals.

Rapid Environmental Impact Assessment of SANEES Alloys Pvt Ltd, Coimbatore

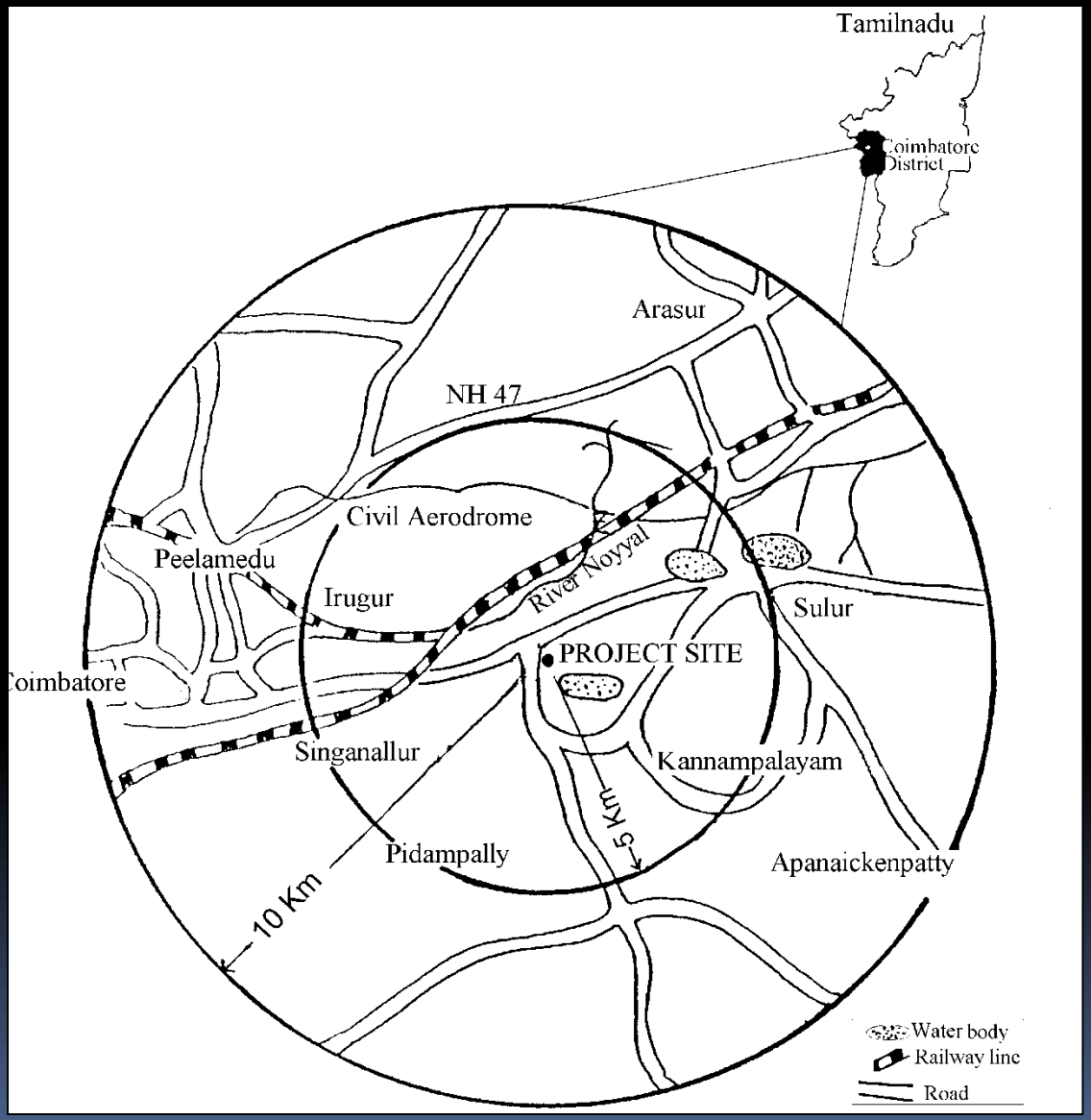
The project location

- 12 km east of Coimbatore railway station on Trichy high way, about 10 km from the Sulur airforce aerodrome

Scope

- **To identify and quantify significant impacts of operation related activities of the project on the above**
- **To assess the baseline status of air, water, soil, noise, flora and fauna of the impact zone, environmental components**
- **To prepare Environmental Management Plan (EMP) for mitigation of adverse impacts**

Study area


Tamilnadu
Coimbatore District
Arasur
NH 47
Civil Aerodrome
Peelamedu
Irugur
River Noyyal
Sulur
PROJECT SITE
Coimbatore
Singanallur
Kannampalayam
5 Km
Pidampally
Apanaickenpatty
10 Km
Water body
Railway line
Road

Mitigatory measures and EMP

- Generator stack may be raised according to specifications by CPCB
- The induction furnace exhaust may be raised by 3 m above the roof level
- Regarding the noise level, all the equipment may be specified to meet 85-dB (A) at 1m.
- A blower of about 1 HP capacity may be provided to facilitate the dispersal of fumes.
- A dust collector may be provided for the induction furnace
- The solid wastes generated may be sent to an identified landfill after conducting a study on possibility of leachables present in the wastes.
- Green belt should be developed with trees interspersed with shrubs. Species of plants that have the capacity to accumulate dust and gaseous pollutants are recommended for plantation.
- Environmental audits may be carried out on bi-annual basis as per regulatory requirements.

EIA of Puyankutty Hydroelectric project

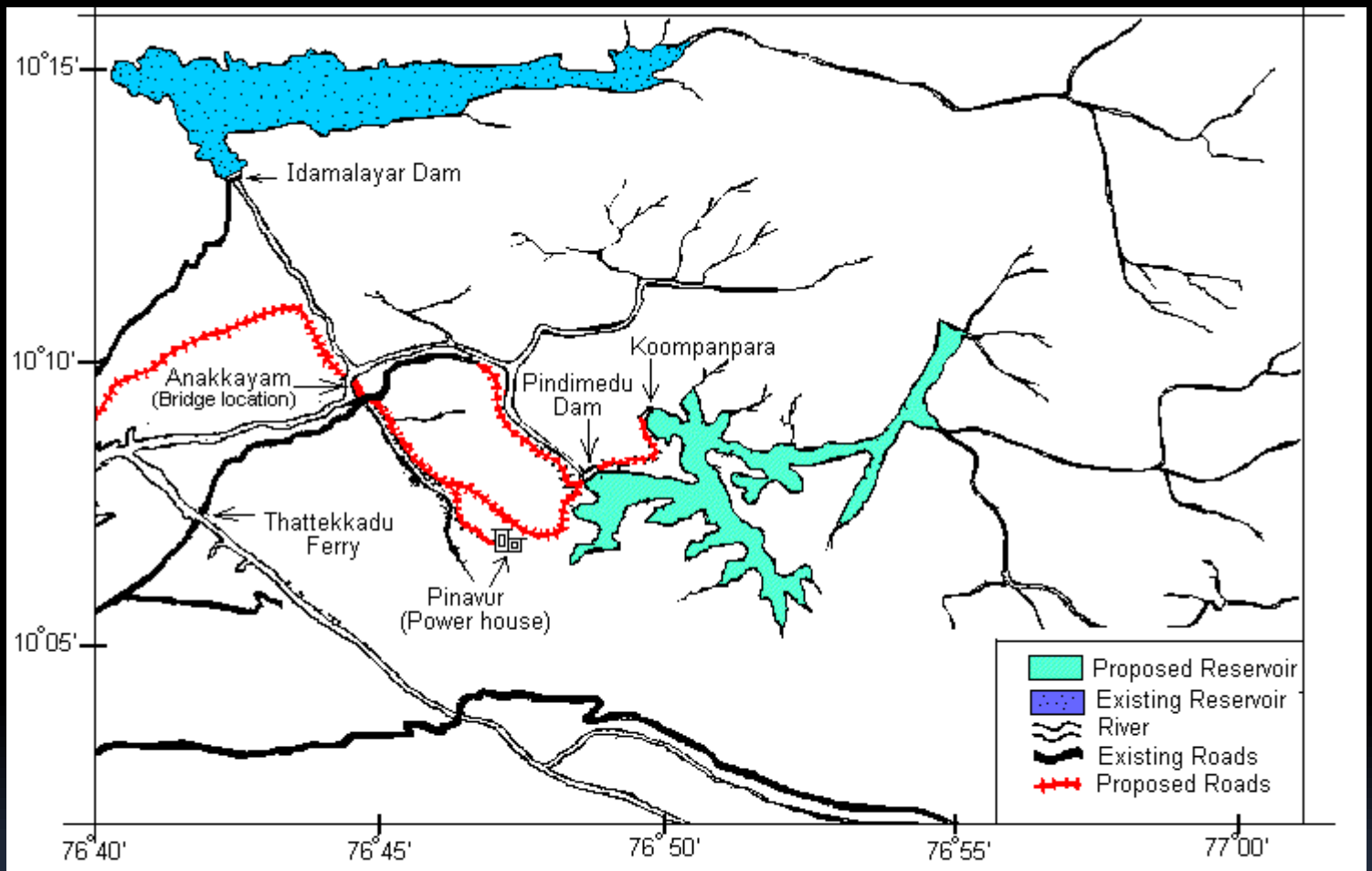


Figure 2 Puyankutty Hydro Electric Project, Stage 1

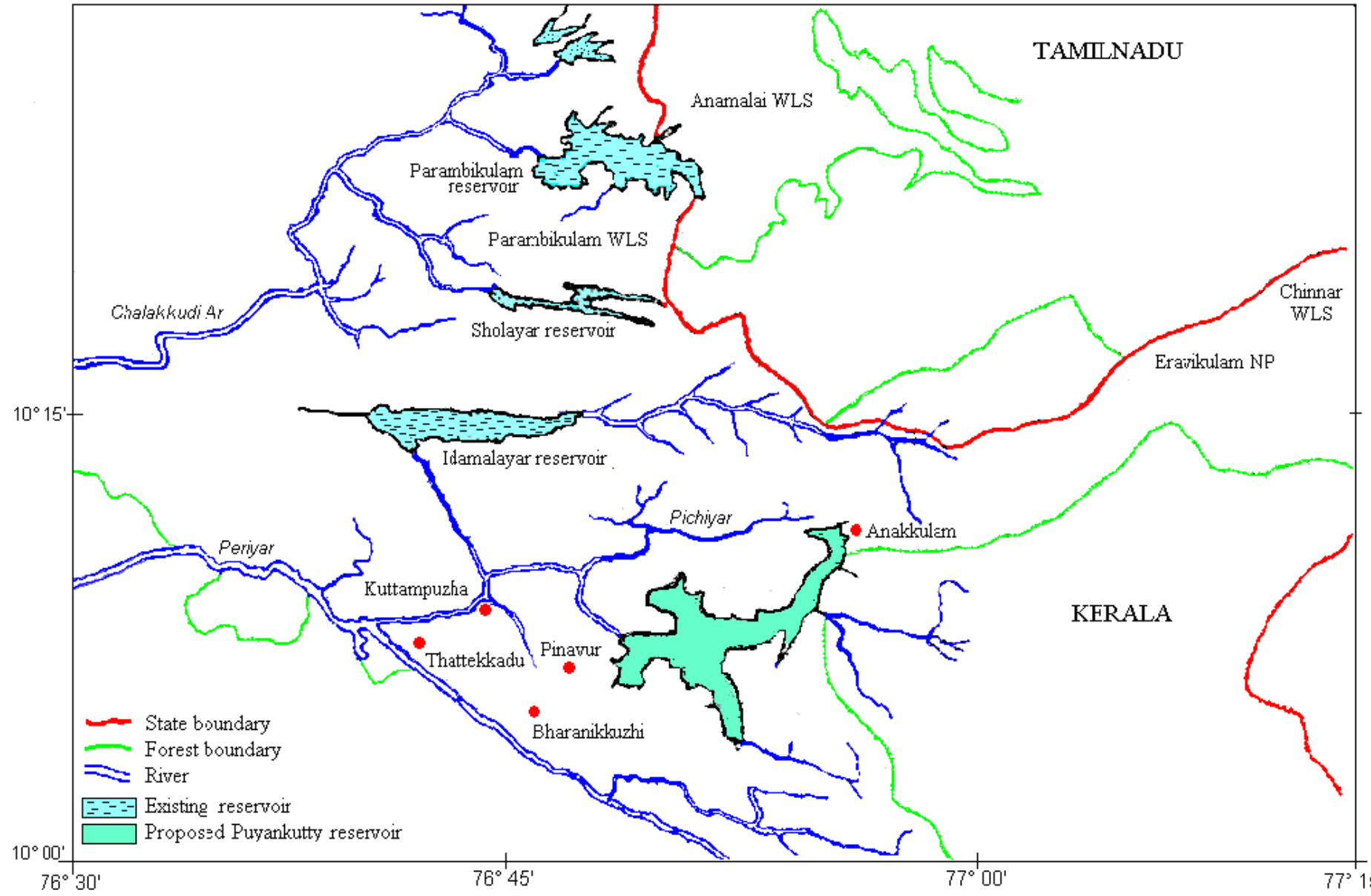
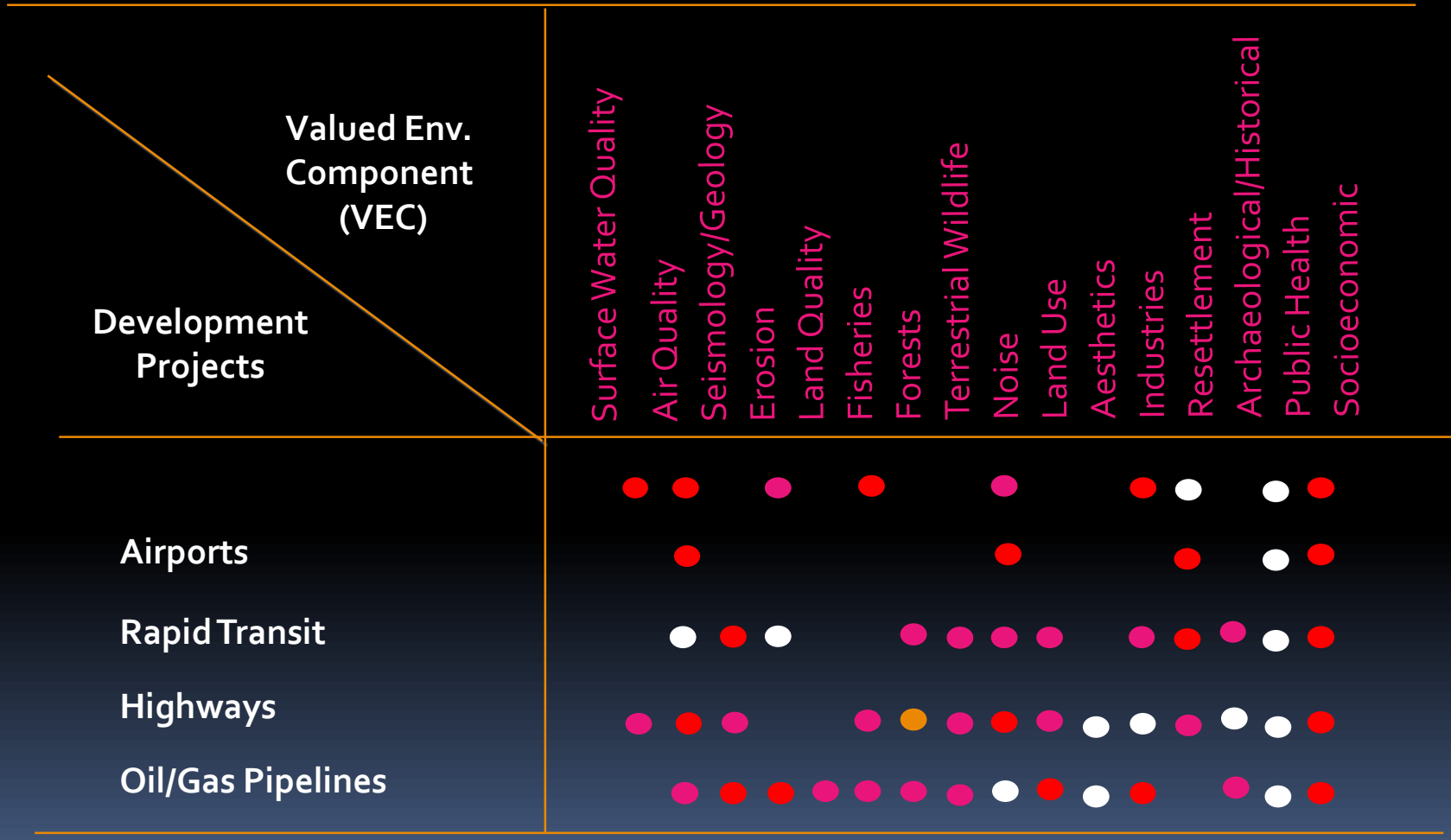


Figure 8 Larger view of the Puyankutty catchment

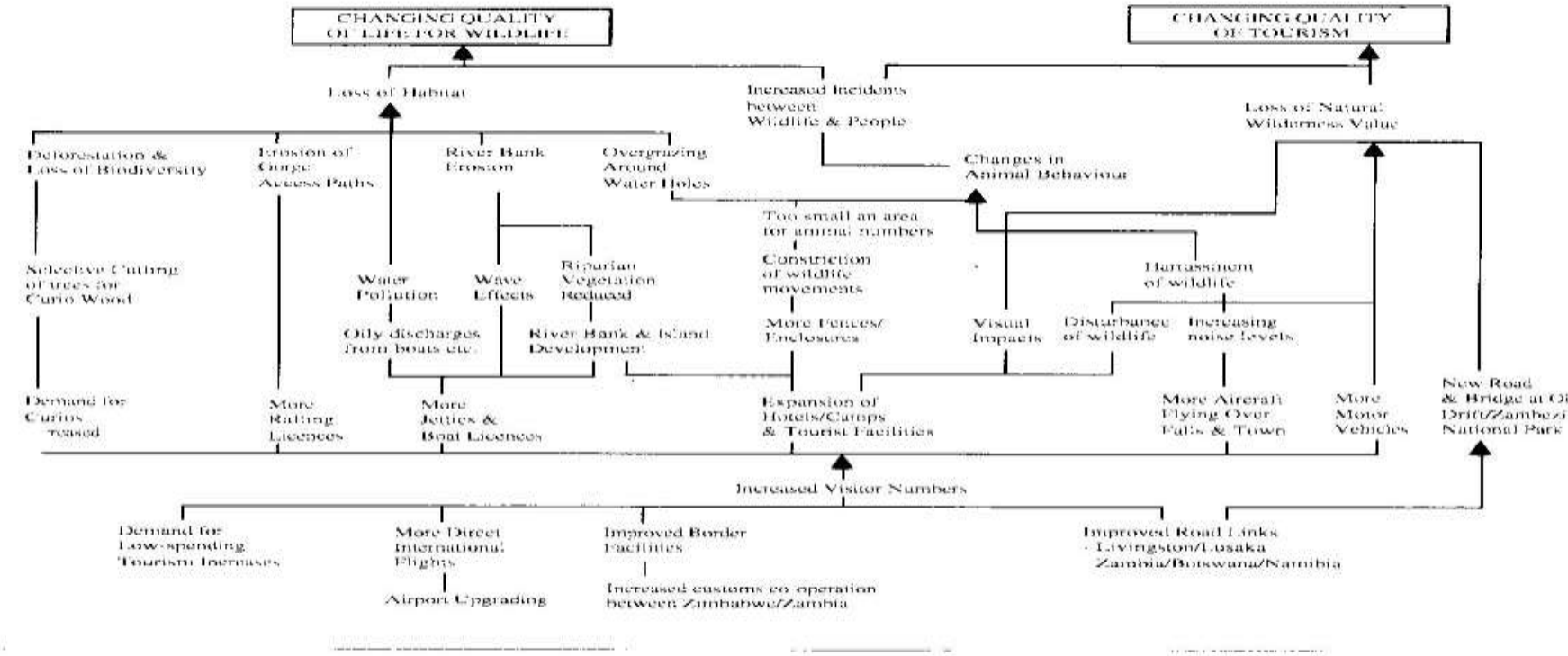
EIA Impact Identification Methods

- Checklists
- Matrices
- Networks
- Overlays/GIS
- Expert Systems
- Risk Assessment

Sectoral Matrix Example



Network showing impact linkages leading to changes in quality of life, wildlife and tourism (arising from increased visitor numbers)



(Source: Bisset personal communication)

Methods: Modeling

Use: i) powerful for quantifying cause-and-effect relationships ii) can take form of mathematical equations describing processes and effects, iii) may constitute an expert system to compute effects of various project scenarios based on program of logical decisions

Strengths: i) can give unequivocal decisions, ii) address cause-and-effect relationships, iii) quantification, iv) can integrate time and space

Weakness: Need a lot of data, Can be expensive, intractable with many interactions

Methods: Overlay mapping and GIS

Use: i) It incorporates location information into effects analysis and help set boundaries for analysis , ii) analyze landscape parameters, iii) identify areas were effects will be greatest.

Strengths: i) Address spatial pattern and proximity of effects, ii) effective visual presentations, iii) can optimize development options

Weakness: i) limited to effects based on location, ii) do not explicitly address indirect effects, iii)difficult to address magnitude of effects

EIA: Misconceptions and counter arguments