TECHNICAL DETAILS

POLLUTION LOAD CARRYING CAPACITY IN RAIPUR, RAIGARH, KORBA AND JANJGIR-CHAMPA REGION

Part – I

1.	Title of the project		Study of load carrying capacity in Raipur, Raigarh, Korba and Janjgir-Champa region
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4.	Objective of the project	:	The main objective of this project is the find our load carrying capacity for sustainable development and planning for future. The study will delineate a framework for sustainable development based on the concept and premises of carrying capacity (inter-alia addressing the issues of regional environmental management plan) with a view to maximizing the equitable quality of life; and minimizing environmental degradation and ecological loading due to various future developmental activities proposed in Raipur, Raigarh, Korba and Janjgir-Champa region.

5.	**Scope of the work**	:	The study proposed in this project is based on the concept of carrying capacity and would involve collation of baseline environmental quality data and concomitant modeling for establishing regional assimilative capacity with respect to air, noise, water, land, biological and socio-economic components of environment, as also supportive capacity analysis of the natural systems in the region, keeping in view the large scale developmental activities. The study will delineate a framework for sustainable development based on the concept and premises of carrying capacity (inter-alia addressing the issues of regional environmental management plan) with a view to maximizing the equitable quality of life; and minimizing environmental degradation and ecological loading due to various future developmental activities proposed in Raipur, Raigarh, Korba and Janjgir-Champa region. The study area will include 25 km radius with Raipur, Raigarh, Korba and Janjgir-Champa city as epicenter.

The major components of the study would be the assessment of various activities in the region, estimation of assimilative capacity and supportive capacity leading to delineation of appropriate environment management plan for sustainable development of the region.

5.1 Assessment of Various Activities in the Study Region of Raipur, Raigarh, Korba and Janjgir-Champa region

- Identification of various activities viz. industrial, commercial, residential, transport, construction etc. in the region.

- Quantification of waste generation due various activities in terms of air, wastewater and solid waste

- Prediction of impacts due to various activities on different receiving environments, viz. air, water bodies (rivers, lakes, ponds, reservoirs, ground water etc.), land (soil, agriculture, land use pattern)

5.2 Estimation of Regional Assimilative Capacity

The major elements of work in the estimation of assimilative capacity are:

- Assessment of present level of pollution due to various activities (industries, commercial, residential, institutional, construction, transport etc.)

- Characterization of receiving environment (air, water & land) for predictive modeling

- Delineation of sources of pollution and quantification of pollution loads

- Validation of predictive models using data on present pollution loads and environmental quality status

				• Estimation of future pollution loads and pollution levels in the next 10 years • Assessment of congestion levels based on environmental standards for receptors • Delineation of environmental management plans to prevent and minimize pollution loads on environment
6.	**Detailed work plan**			**6.1 Air Environment** Assimilative capacity of air environment is the maximum quantity of gaseous pollutants that can be discharged in ambient air without violating environmental standards and is governed by phenomena, viz. transport, dispersion, deposition and absorption available in the region. The assimilation potential of an air-shed can be estimated based on ventilation coefficient. The study includes: • Preparation of inventory of point, line and area sources. • Quantification of emissions from all existing sources. • Ambient air quantity monitoring on upwind and downwind directions. • Quantification of pollution load due to various activities with respect to different pollutants (particulate matter/dust and gaseous emissions) • Prediction of cumulative impacts of all the air pollution sources using appropriate mathematical models • Estimation of assimilative capacity of the region for various pollutants vis-à-vis air quality standards • Assessment of present pollution loads and environmental quality status and predicting the cumulative impacts under different future development scenarios • Delineation of environment management plans to minimize adverse impacts due to various air pollution sources. **6.2 Water Environment** Basic phenomenon governing the assimilative capacity of a water body is its self-purification capacity. The estimation of assimilative capacity of water environment involves: • Assessment of water resources (surface and ground) with respect to quantity and quality in the study area. • Quantification and characterization of water pollution loads due to various existing activities • Impact of water withdrawal on surface and groundwater sources, if any • Prediction and evaluation of impacts due to wastewater

discharges from various activities on receiving water bodies, if any

- Delineation of appropriate water environment management plan for the pollution sources

6.3   Land Environment

The assessment of assimilative capacity of land environment demands ascertaining physico-chemical characteristics of soils, nature of wastes, biomass to be grown, and design of environmentally compatible waste management systems. The work plan involves:

- Assessment of existing land use pattern based on satellite imageries and field surveys

- Quantification of municipal and industrial solid waste generation

- Inventorisation and management plan for Hazardous Waste and E-Waste

- Assessment of present solid waste disposal practices and its impact on the present receiving land environment

- Collection of soil samples and analysis for physico-chemical and micro-biological characteristics

- Delineation of municipal and industrial solid waste management plan

6.4   Noise Environment

The assimilative capacity of the acoustic environment is the sound level that can be allowed in a region without causing personal/community nuisance. The phenomenon governing assimilative capacity includes propagation of sound through ambient air, its absorption, scattering, divergence and attenuation. The study includes:

- Assessment of present noise levels various activities, work places, residential areas, state/national highways, commercial centers, hospitals, schools etc. in the region (noise data generated by industries & other agencies to be used)

- Assessment of noise impacts due to various activities

- Prediction and evaluation of impacts due to noise generation by existing and proposed developmental activities including transportation

- Identification of high noise level zones requiring mitigation measures

- Delineation of source specific noise management plan to minimize the impact of noise & vibration

6.5 Biological Environment

Assimilative capacity of biological environment is reflected through the capacity of plants to absorb/adsorb pollutants without plant damage. It involves:

			• Studies on flora and fauna in the region through field survey
			• Biodiversity of avi-fauna and wild life in the study area, if any
			• Collection of information on terrestrial and aquatic ecosystems
			• Prediction of impacts due to existing various activities on the flora and fauna in the area with special reference to biological diversity
			• Identification of suitable native tree species for afforestation
			• Assessment of forest resource, economically important plants, medicinal plants, and perceived threat to rare and endangered species due to deforestation & construction activities
			• Mitigation measures to compensate the loss of forest cover/ green cover
			• Identification of measures for protection and conservation of flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
			• Identification of suitable native tree species for compensatory afforestation, green belt in the study region
			• Delineation of appropriate environment management plan for development of greenbelt/green cover in the study region.
7.	**Methodology**	:	**Delineation of Environmental Management Plan (EMP)** • On the basis of baseline data of different environmental components, identification, prediction and evaluation of impacts, appropriate strategies would be formulated under each environmental component for minimization of adverse impacts. • EMP would address details of scientific methods for the protection and conservation of environmental quality to achieve sustainable development.
8.	**Study Deliverables**		• Status of existing/baseline environmental quality related to air, water, noise, soil and solid wastes in the study region • Identification of impacts on environment and resources due to present and proposed developmental activities in the region • Quantification of pollution loads for current as well as future growth scenarios in the next 10 years • Assimilative capacity of the region for various pollutants • Delineation of regional management plans and growth scenarios in terms of time and space to keep the impacts within the assimilative capacity of the region • Suggest preferred developmental scenario.