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Environmental Impact Assessment In Kannankurchi Town Panchayat

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ABSTRACT

This project evaluates an Environmental Impact Assessment (EIA) for Kannakuruchi Town Panchayat, Salem by using Rapid Impact Assessment Matrix (RIAM) tool. EIA analysis has four sequential phases such as identification, analysing, prediction and policy making. Identification involves characterizing the existing physical, social, economic, and ecological environment due to rapid urbanization and unsustainable development which are severely impact the condition of present and future environment by direct or indirect mode. In this project we have identified the components like water born diseases, improper disposal of solid waste and usage of plastic in a study area. For analysis we have collected the real time data from the various house holds in a study area. Then the collected data is categories based on its mode of impact over an environment and its root mean square value. The analysed data then fed in to the RIAM software in order to make prediction action. Based on the output from the RIAM in terms of relative figures and tables we have developed the comparative statement of various components of impact over an environment. From the RIAM output, it is found that the negative impact is about 67% and positive impact is disposal and usage of plastic wastes are dominated in this study. For that, we have adopted the various policies in order to reduce the considerable effect in present condition and future prediction of impacts so as to create a sustainable environment.

KEYWORDS : Environmental Impact Assessment, Kannankurchi, Town Panchayat, Salem

1. INTRODUCTION

This project evaluates an Environmental Impact Assessment (EIA) for Kannakuruchi Town Panchayat, Salem by using Rapid Impact Assessment Matrix (RIAM) tool. EIA analysis has four sequential phases such as identification, analysing, prediction and policy making. Identification involves characterizing the existing physical, social, economic, and ecological environment due to rapid urbanization and unsustainable development which are severely impact the condition of present and future environment by direct or indirect mode.

2. OBJECTIVES

The objectives of the study are,

- To identify, predict, and evaluate various impacts on environment in Kannakuruchi Town Panchayat area
- To implement different policies against improper solid waste disposal, usage of plastics, and pollution of water

3. SCOPE

Establishing the scope of the EIA is a fundamental component of the EIA process. The purpose of EIA scoping is to define those environmental topics that should be assessed as part of the EIA, the methods to be used and the geographical scope of the environmental impact assessment. Although not a mandatory requirement, EIA scoping is an important facet of the environmental impact assessment process. This importance was highlighted in the Department of Environment's "Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment: A Good Practice Guide".

4. EIA DEVELOPMENT

EIA has been widely used in many countries for various projects. The countries that are adapting EIA are Australia, China, Egypt, European Union, Netherland, Nepal, Malaysia, New Zealand, Sri Lanka, and United States.

The Ministry of Environment and Forests of India have been in a great effort in Environmental Impact Assessment in India. The main laws in nation are Water Act (1974), The Indian Wildlife (Protection) Act (1972), The Air (Prevention and Control of Pollution) Act (1981) and The Environment (Protection) Act (1986).

The responsible body for this is Central Pollution Control Board. Environmental Impact Assessment (EIA) studies need a significant amount of primary and secondary environmental data. The primary data are those which need to be collected in the field to define the status of environment (like air quality data, water quality data etc).

The secondary data are those data which have been collected over the years and can be used to understand the existing environmental scenario of the study area. The environmental impact assessment (EIA) studies are conducted over a short period of time and therefore the

understanding the environmental trends based on few months of primary data has its own limitations.

Ideally, the primary data has to be considered along with the secondary data for complete understanding of the existing environmental status of the area. The Environmental Impact Assessment (EIA) experience in India indicates that the lack of timely availability of reliable and authentic environmental data has been a major bottle neck in achieving the full benefits of EIA.

The environment being a multi-disciplinary subject, a multitude of agencies is involved in collection of environmental data. Environmental Information Centre (EIC) has been set up to serve as a professionally managed clearing house of environmental information that can be used by MoEF, project proponents, consultants, NGOs and other stakeholders involved in the process of environmental impact assessment in India. Table 1 shows the Institutional arrangements and environmental agencies for EIA in India

TABLE 1 INSTITUTIONAL ARRANGEMENTS AND ENVIRONMENTAL AGENCIES FOR EIA IN INDIA

Country	Main Oversight Agency	Legislative & Administrative Documents	Date of Enactment
INDIA	Department of Environment within the Ministry of Environment	• Administrative instructions established • Constitutional provision: articles 48A and 51A(g) • Department of Environment(protection) Act no.29 • Specific legislation is planned	1973 1977 1986

5. EIA NOTIFICATIONS

EIA Notifications q A Gazette Notification vide S.O. 801(E) dated 7th July, 2004 was issued to finalise draft Notification S.O.No.1236(E) dated 27th October, 2003 to amendment the EIA Notification S.O. 60(E) dated 27th January, 1994. The Notification has brought new projects relating to construction of townships, industrial townships, settlement colonies, commercial complexes, hotel complexes, hospitals, office complexes for 1,000 persons and above or discharging sewage of 50,000 liters/day and above or with an investment of Rs.50 crores and above and new industrial estates having an area of 50 hectares and above and the industrial estates irrespective of area if their pollution potential is high, under the purview of Environment Impact Assessment Notification, 1994.

6. KANNANKURICHI TOWN PANCHAYAT

Our study area is kannankurchi town panchayat (Fig.1) which is located in Salem District. This area was most affected by solid waste disposal, usage of plastics and pollution of water. The population of this town panchayat is 25000 approximately. Land area is about 5.2 km². Surface water resources that are available in this area include Kannankurchi Lake and Pudhu eri. Under ground water resources are 10 open well and 28 tube wells.

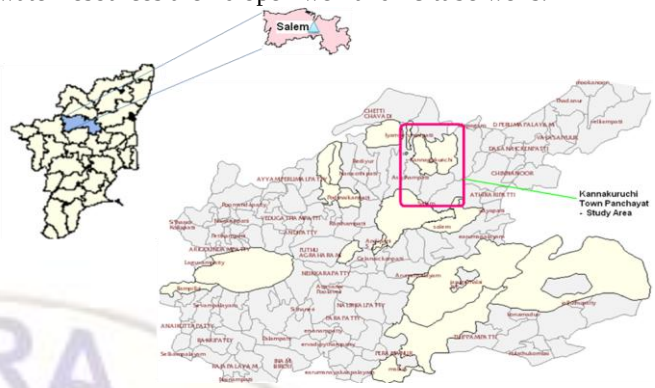


Figure. 1 Kannankurchi Town Panchayat in Salem District

Local drinking water supply to residence per day is 25lit/capita. Length of the canal to carry surplus water from Kannankurichi Lake is 6.93 km.

7. EIA

Environmental Impact Assessment(EIA) is a process by which the likely effects of a project or development on the environment are identified, assessed and then taken into account by the competent authority in the decision making process. It is a systematic process that examines in advance the environmental impacts of proposed development actions and therefore can contribute to better alternative from an environmental perspective.

8. PROBLEM IDENTIFICATION

Problem identification include assessment of impacts and to determine the order in which impacts are to be avoided, mitigated or compensated. Mitigation consists of measures to avoid, reduce and if possible to remedy significant environmental effects. We found the problems in our area and we collected the details related to those problems such as no proper disposal of solid waste, sewage intrusion in lake, blockage of drainage by plastic bottles, usage of plastics that affects environment.

9. RAPID IMPACT ASSESSMENT MATRIX

9.1 Physical / Chemical (PC)

Includes all physical and chemical aspects of the environment, including non renewable natural resources (no-biological) and the degradation of the physical environment through pollution. It also includes geophysics, soil, water quality & water resources, climate, air quality, environmental noise, rainfall, loss of forest cover, solid waste.

9.2 Biological / Ecological (BE)

Includes all biological aspects of the environment, including renewable natural resources, conservation of the biodiversity, interaction between species and pollution of the biosphere. It also includes flora, fauna, vegetation, habitat lose, house sanitation, sewage intrusion, proper sewage connection, foul smells.

9.3 Sociological / Cultural (SC)

Includes all human aspects of the environment, including social subjects that affect the individuals and the communities; with cultural aspects, it is included the inheritance conservation and human development. It also includes culture, education, science, mosquitoes, house flies, medical facilities, development due to technology.

9.4 Economical / Operational (EO)

To identify qualitatively the economical consequences of environmental change, temporary and permanent, as well as the complexities of administration of the projects inside the context of the activity project. It also includes job, access road, tourism.

10. ASSESSMENT CRITERIA

The important assessment criteria fall into two groups.

Group A*:* Criteria that are of importance to the condition, and which can individually change the score obtained.

A measure of the importance of the relevance condition (A1) is evaluated according to the space borders or interest of the man that will be affected.

The magnitude (A2) is defined as a measure of the scale of benefit / damage of an impact or condition.

Group B*:* Criteria that are of value to the situation, but should not be individually capable of changing the score obtained.

This permanent criterion (B1) defines if a condition is temporary or permanent, and if it should only be seen as a measure of the temporary state of the condition.

The reversibility criterion (B2) defines if a condition can be changed and if it can be seen as a measure of control on effect of the condition.

This cumulative criterion (B3), where the effect of a condition will have a single direct impact or there will be a cumulative effect during the course of time, or, on the other hand, a synergetic effect with other conditions. Theoretically, the cumulative criterion is the mean used to judge the sustainability of a condition, and it should not be confused with a permanent situation or reversible condition.

After necessary calculations, the RIAM classifies the degree of the damage or benefit according to Table.2. The value allotted to each of these groups of criteria is determined by the use of a series of simple formulae. These formulae allow the scores for the Individual components(Table.3.) to be determined on a definite basis. The process can be expressed (Pastakia, 1998)

If (a1) * (a2) = aT and (b1) + (b2) + (b3) = bT

Then **(aT) * (bT) = ES** (1)

Where

- (a1) and (a2) are the individual criteria scores for group (A)
- (b1) to (b3) are the individual criteria scores for group (B)
- aT is the result of multiplication of all (A) scores
- bT is the result of summation of all (B) scores
- ES is the Environmental Score for the condition

TABLE. 2. DESCRIPTION OF CLASS ON RIAM

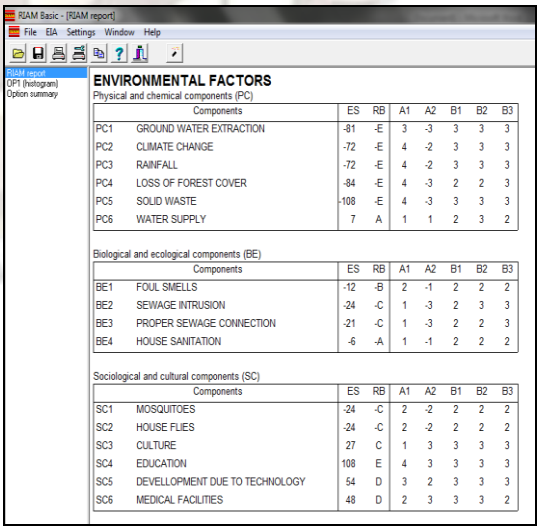
Environmental classification (ES)	Value of the class	Value of the class (numerical)	Description of the class
72 to 108	E	5	Extremely positive impact
36 to 71	D	4	Significantly positive impact
19 to 35	C	3	Moderately positive impact
10 to 18	B	2	Less positive impact
1 to 9	A	1	Reduced positive impact
0	N	0	No alteration
-1 to -9	-A	-1	Reduced negative impact
-10 to -18	-B	-2	Less negative impact
-19 to -35	-C	-3	Moderately negative impact
-36 to -71	-D	-4	Significantly negative impact
-72 to -108	-E	-5	Extremely negative impact

TABLE 3 ASSESSMENT CRITERIA (PASTAKIA & JENSEN,1998)

Group	Category	Scale	Description
A	A1 Importance of condition	4	International importance
		3	National importance
		2	Outside of local condition
		1	Local condition
		0	Not Important
	A2 Magnitude of change-effect	+3	Major positive benefit
		+2	Significant improvement
		+1	Improvement in "status quo"
		0	No change / "status quo"
		-1	Negative change to "status quo"
		-2	Significant negative effect
		-3	Major negative effect
B	B1 Permanence	1	No change / not applicable
		2	Temporary
		3	Permanent
	B2 Reversibility	1	No change / not applicable
		2	Reversible
		3	Irreversible
	B3 Cumulative	1	No change / not applicable
		2	Non – cumulative /single
		3	Cumulative / synergistic

The various impact factors and environmental impact values area assigned is RIAM are stated in Table.3.& Table.4.

TABLE 3 RIAM REPORT FOR VARIOUS ENVIRONMENTAL FACTORS WITH THEIR VALUES


RIAM Basic - [RIAM report]

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RIAM report
OP1 (histogram)
Option summary

ENVIRONMENTAL FACTORS

Physical and chemical components (PC)

	Components	ES	RB	A1	A2	B1	B2	B3
PC1	GROUND WATER EXTRACTION	-81	-E	3	-3	3	3	3
PC2	CLIMATE CHANGE	-72	-E	4	-2	3	3	3
PC3	RAINFALL	-72	-E	4	-2	3	3	3
PC4	LOSS OF FOREST COVER	-84	-E	4	-3	2	2	3
PC5	SOLID WASTE	-108	-E	4	-3	3	3	3
PC6	WATER SUPPLY	7	A	1	1	2	3	2

Biological and ecological components (BE)

	Components	ES	RB	A1	A2	B1	B2	B3
BE1	FOUL SMELLS	-12	-B	2	-1	2	2	2
BE2	SEWAGE INTRUSION	-24	-C	1	-3	2	3	3
BE3	PROPER SEWAGE CONNECTION	-21	-C	1	-3	2	2	3
BE4	HOUSE SANITATION	-6	-A	1	-1	2	2	2

Sociological and cultural components (SC)

	Components	ES	RB	A1	A2	B1	B2	B3
SC1	MOSQUITOES	-24	-C	2	-2	2	2	2
SC2	HOUSE FLIES	-24	-C	2	-2	2	2	2
SC3	CULTURE	27	C	1	3	3	3	3
SC4	EDUCATION	108	E	4	3	3	3	3
SC5	DEVELLOPMENT DUE TO TECHNOLOGY	54	D	3	2	3	3	3
SC6	MEDICAL FACILITIES	48	D	2	3	3	3	2

TABLE 4 SUMMARY OF THE SCORES IN RIAM REPORT

Economical and operational components (EO)

Components		ES	RB	A1	A2	B1	B2	B3
EO1	ACCESS ROAD	-30	-C	3	-2	2	2	1
EO2	JOB OPPOURTUNITIES	16	B	1	2	3	3	2
EO3	TOURISM	63	D	3	3	2	2	3

Summary of scores

Range	-108 -72	-71 -36	-35 -19	-18 -10	-9 -1	0	1 9	10 18	19 35	36 71	72 108
Class	-E	-D	-C	-B	-A	N	A	B	C	D	E
PC	5	0	0	0	0	0	1	0	0	0	0
BE	0	0	2	1	1	0	0	0	0	0	0
SC	0	0	2	0	0	0	0	0	1	2	1
EO	0	0	1	0	0	0	0	1	0	1	0
Total	5	0	5	1	1	0	1	1	1	3	1

The conversion of environmental scores to range values for various environmental factors are shown in Figure 2. The impact of physical /chemical components and biological /economical components are shown in Figure 3. The impact of social & cultural components and environmental & operational components are shown in Figure.4.The option summary for the components are shown in Figure.5 The Summary of assessment results are given in Table.5. Figure.6. shows that the final results of EIA

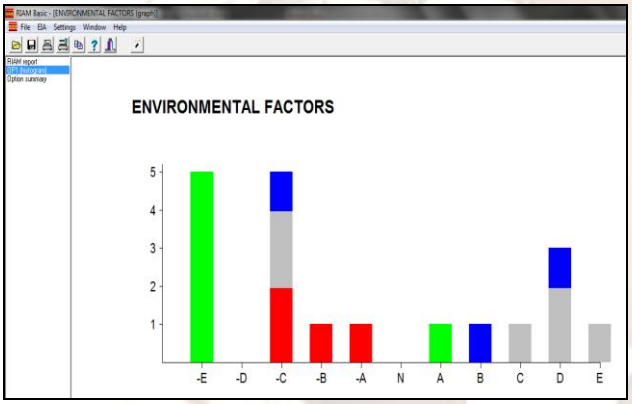

FIGURE 2 CONVERSION OF ENVIRONMENTAL SCORES TO RANGE VALUES FOR VARIOUS ENVIRONMENTAL FACTORS

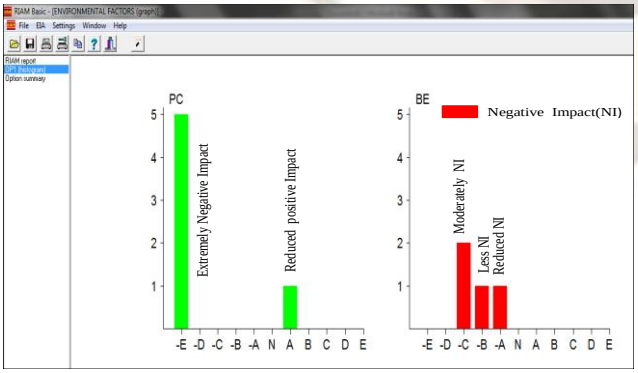

FIGURE 3 IMPACT OF PHYSICAL /CHEMICAL COMPONENTS AND BIOLOGICAL /ECONOMICAL COMPONENTS

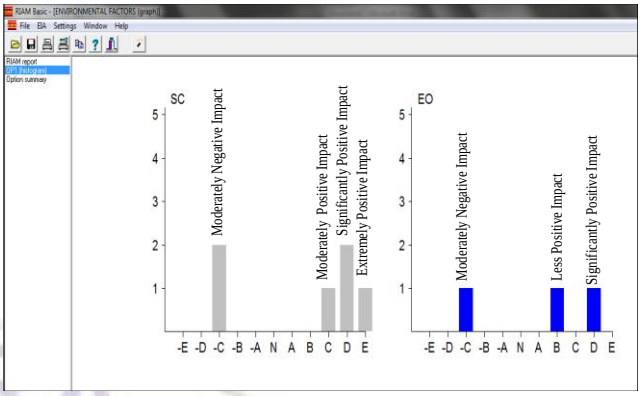

FIGURE.4 IMPACT OF SOCIAL & CULTURAL COMPONENTS AND ENVIRONMENTAL & OPERATIONAL COMPONENTS

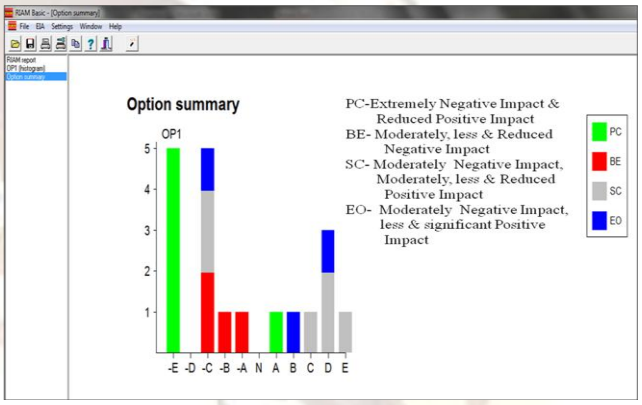

FIGURE.5 OPTION SUMMARY FOR THE COMPONENTS

TABLE 5. SUMMARY OF ASSESSMENT RESULTS

ES	RV	RVN	PC	BE	SC	EO	TOTAL	FINAL	%
72 to 108	E	5	0	0	1	0	1	5	6
36 to 71	D	4	0	0	2	1	3	12	14
19 to 35	C	3	0	0	1	0	1	3	5
10 to 18	B	2	0	0	0	1	1	2	4
1 to 9	A	1	1	0	0	0	1	1	2
0	N	0	0	0	0	0	0	0	0
-1 to -9	-A	-1	0	1	0	0	1	1	2
-10 to-18	-B	-2	0	1	0	0	1	2	4
-19 to -35	-C	-3	0	2	2	1	5	15	23
-36 to-71	-D	-4	0	0	0	0	0	0	0
-72 to -108	-E	-5	5	0	0	0	5	25	38

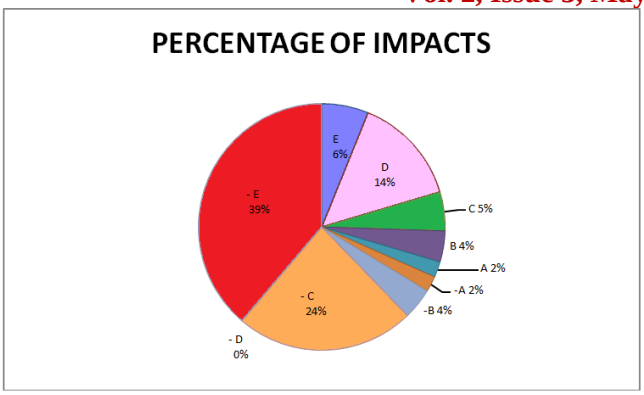

FIGURE.6 PERCENTAGE OF IMPACTS

It is found that due to development activity, the negative impact is about 67% and positive impact is about 33%. Since the negative impact on environmental and human health is more. The environmental management plans has to be implemented properly and make it as a effective solution for the above negative impacts and we should try to maintain sustainability of resources without polluting and over exploiting the resources of future generation.

11.CONCLUSION

The developmental activities have imparted both positive and negative impacts. It is found that the negative impacts are around 67% and positive impact is around 33%.To reduce the negative impacts improper solid waste disposal, usage of plastic bags, sewage intrusion in canals and lakes. We have formulated different policies like vermicomposting, recycling machine, treatment plant.

If these policies are properly implemented and managed then the negative impacts can be considerably reduced to 33% (i.e one third). If the above policies are integrated to the whole Salem district, then the future development of Salem as a metropolitan city will cause very minor effect to the environment and tends to be a safest development unlike other metropolitans.

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