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SOLID WASTE MANAGEMENT USING REMOTE SENSING & GIS TECHNIQUES:A CASE STUDY OF BARIPADA, MAYURBHANJ DISTRICT,ODISHA

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ABSTRACT

Solid waste is one of the non-degradable wastes in ruining the environment day by day. The waste generally come as domestic waste as polythene, commercial wastes, industrial waste etc. Baripada being the heart of a tribal dominated district like Mayurbhanj in Orissa in developing day by day. The population is increasing day by day, thus, the demanding for more use of households need. The solid wastes like polythene, paper, are the result of this. So, it is very much crucial to manage their wastes for sustainable environment. For the management, it is important to know the area of contamination, areas with high density wastes, its dumping sites etc. Remote Sensing & GIS is the method used to locate and prepare an effective and long- run plan for solid waste management. The more wild be the aerial data on these. GIS softwares are used for analyzing and mapping. The more will the effectiveness of management.

INTRODUCTION

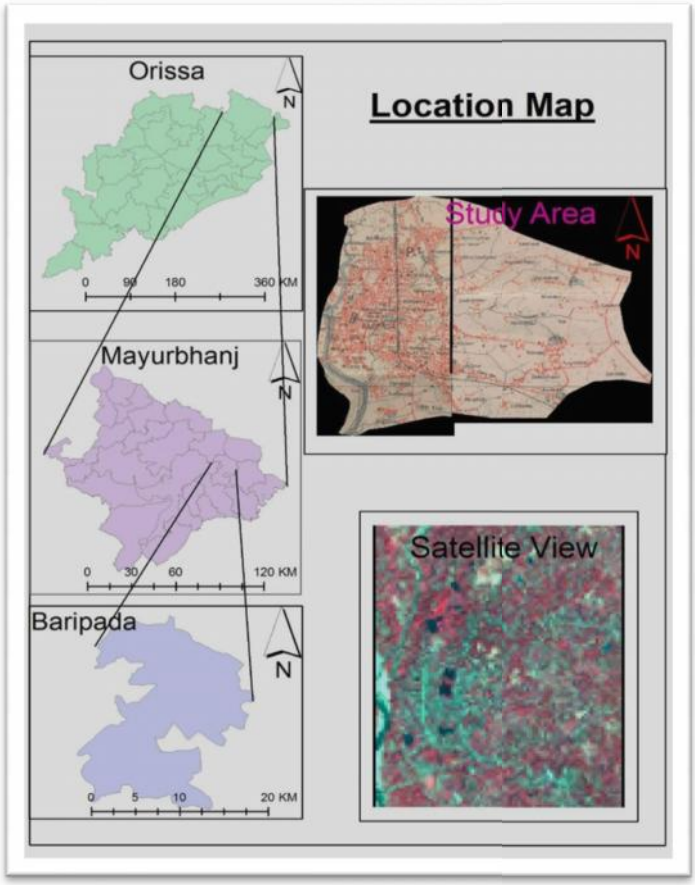
Solid waste is a daily releasing materials which make a common problem for everyone, who put out these to dustbin, and also who deposit it to their destiny. This is a most serious environmental problem and metro cities and developing towns are suffering by these. Solid waste comes from the door to door and distributes road to road. The plastics, waste paper, kitchen wastes, and food waste are common collection, which found at every dustbin, waste depositing places. The role of plastics, paper, and other extra thing which are unusual for community, is known as solid waste. In every society; a planner, a manager is found who plans to deposit wastes to their destiny like a recycling factory or to the waste land. But in except, causes of improper management of solid waste become an environmental problem including diseases transmission, economic loss and atmospheric like water and air pollutions.

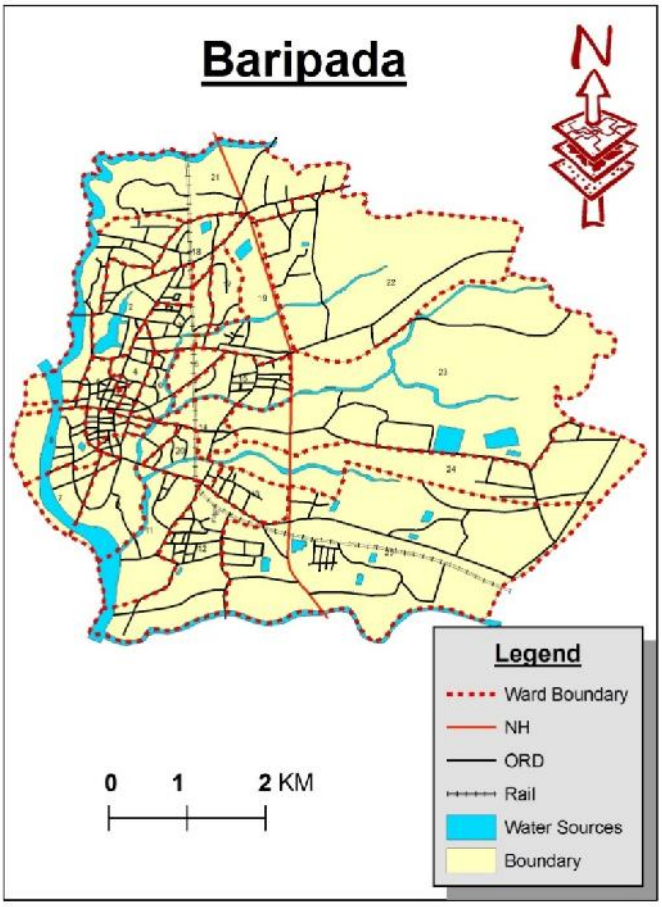
OBJECTIVES

- To locate all dumping sites
- To identify the environmental problemscreated due to the indiscriminate solidwaste disposal in the study area
- To select some suitable solid waste disposalsites using GIS techniques in the outer side of studyarea
- To findout solution for solid waste management

STUDY AREA

Baripada is located at Northern part of Mayurbhanj District of Orissa extend between 86^{o} 41’ 00” North longitudes to 21^{o} 55’ 45” East latitude. The study area is a transitional part of Similipal biosphere reserve. Mean sea level of study area is 50 Mt. above. About 95,400 Population live in 20 Km^{2}. Main Riverthe Budhabalanga is flowing at western side of study area. Study area is a district Headquarter of Mayurbhanj District.





Baripada is a developing town. This is a just allowance as an urban region. Population of study area is high dense. Northern part of town is called as Takatpur, where a university with naming North Orissa University is situated. Railway Platform found In the Western part. Northern & western part of the town is being home for migrant, who comes for their study, service & as a permanent migrant. The living status isgood.

METHODOLOGY

DATA COLLECTION

There two types of data to study:

- Spatial Data
- Non- Spatial Data

SPATIAL DATA

Satellite Images is a good source of information to analysing study area.there is a LISS- lllimge and a high resolution satellite image in visible range of electromagnetic spectrum accuired from Google Map. Study area is good shown in LISS- lll image and google Map presented, where sattlement, roads, river,agricultural field and barren lands.

Toposheets is an another main source of geographical information. Toposheet No. 73 K/9 and 73 K/13 has

NON- SPATIAL DATA

Non- Spatial data is the information of the spatial, like name of the places, stastical data, photos etc. This type of data accuire from field survey, toposheets, satellite images and collect by the local people. Offices like governmental, NGOs, who work related to study area is help us to accuire data the field, taking self accuired data, field survey; collect datas from Municipality office;

Study area is divided into three major sutaibe area for solid waste deposit. Dicission making for safe desposal area is depending on the distance of the different social & cultural centres. The proccess of divission of study area for safe diposit depends in defferent class as follow:

- First priority
- Secondpriority
- Thirdpriority

FIRST PRIORITY

Highly suitable area depend in distance from the defferece socio- cultural criteria to safe deposited area. Low dense area, up lands, land use, barren land, is the suitable sites for deposit if it is far away from the soci- cultural & economical centres. Disposal area satisfy, if distance 100m from drainages, 200m from any water bodies like well, ponds etc; 200 m from hotel, markets and shopping centres, 500 m from bank, 200 m from socio-cultural institutions, 1 km from educational institutions health facilities and administrative offices. Up land or high elevation land, soil type and land use proccess is also a good disposal sites.

SECOND PRIORITY

The moderate sites for disposing solid waste satisfy as distance 75m from drainage, 100m from any water bodies, 300m from hotels, markets and shopping centres etc.; 200m from bank; 300m from socio- cultural institutions, 500m from educational institutions, health facilities and administratine offices. Land use pattern, elevated lands, soil types and moderate dense area. The moderate suitable disposal area plotted in moderate dense area.

THIRD PRIORITY

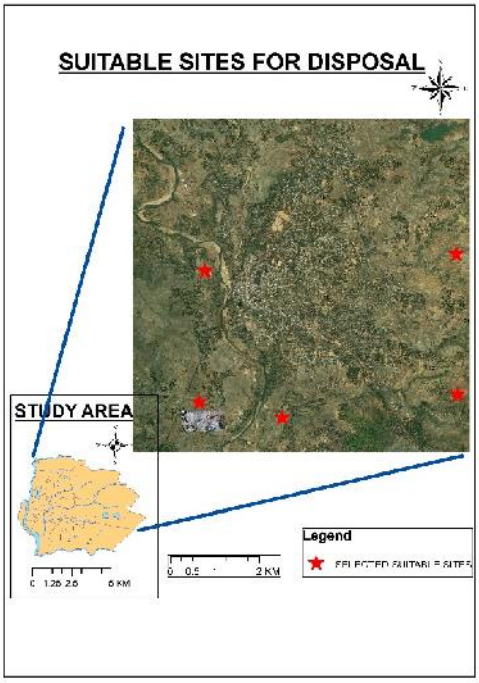
The less suitable sites considered for disposing solid waste if it distant 50m from drainage, 50m from any drainages; 500m from hotel, markets and shopping centres; 100 m from bank, 500 m from socio- cultural institution, 100 m from aducational institutions, health facilities and administrative offices. Land elevation or contour, land use, soil type are also considered for disposal.
The different suitable land for disposing solid waste and distance from the socio- cultural, economical& geographical centres is also shown in following Tabe.

CRITERIA	SUITABILITY CLASS		
	HIGHLY SUITABLE	MODERATELY SUITABLE	LESS SUITABLE
DRAINAGE	100m distant	75m distant	50m distant
ACCESSIBILITY/ HANDINESS	Good	Moderate	less
WATER BODY (PONDS)	200m distant	100m distant	50m distant
SOIL AND LAND CHARECTERICTICS	Mid- upland & Non organic soil	Upland & Non organic soil	Moderately low land & organic soil
COMMERCIAL CENTRES: • Hotel, markets, shopping centres; • Bank	 200m distant 500m distant	 300 m distant 200m distant	 500m or more 100m distant
SOCIAL- CULTURAL INSTITUTIONS: • Community centres, Clubs	 200m distant	 300m distant	 500m distant
EDUCATIONAL INSTITUTIONAL	1 Km distant	500m distant	100m distant
HEALTH FACILITIES	1 Km distant	500m distant	100m distant
ADMINISTRATIVE OFFICES	1 Km distant	500m distant	100m distant

LAND USE • Settlement area • Commercial area • Agricultural area • Railway property area • Mixed build up area	 1 Km distant 1 Km distant 500m distant 200m distant 250m distant	 700m distant 700m distant 300m distant 100m distant 150m distant	 200- 500m distant 200- 500m distant 100- 200m distant 50m distant 150m distant
RIVER AREA	-----	-----	-----
POPULATION	Low dense area	Mid- dense area	High dense area

RESULTS AND DISCUSSION

The current dumping sites of the study area were identified and it was found that the present sites are coming under high density areas. The current study focuses for situation of the next five years. An assumed township area is marked in the picture below. So there should not be any disposal sites within the proposed area.



So the

recommend sites are highlighted in the picture below. The recommended sites are the safe places for waste deposition even after five years.

CONCLUSION

Solid wastes now-a-days is a booming environmental hazard for the urban areas as well as for the rural areas. The impacts of improper disposal are showing in terms of diseases, water pollution and many more. So it is important to adopt the suitable management strategies for environmental sustainability. During the study, high priority was given for suitable management of the degradable as well as the non-degradable solid wastes. It is very much effective to adopt the applications of Remote Sensing and GIS. The areas suggested for disposal of solid wastes is the best sites for dumping wastes. There will be no contamination.

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