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EXPRESSWAYS CAN MAKE WAYS FOR SUSTAINABLE DEVELOPMENT-ZAIDI AND ZAIDI MODEL FOR SUSTAINABLE EXPRESSWAYS

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Abstract: Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Making Expressways is necessity for time saving of transport, travel, and to reduce pollution. But Expressways are the huge monsters to as they eat land and mostly agricultural land rapidly. But using a proper planning Expressways can provide important role in sustainable development. This model comprises an expressway which simultaneously has a residential colonies and places for farming over it, ponds with water recharge systems under the expressway and a parallel sewage line. And so the model provided multiple facilities of human and nature needs. A newly constructed expressway must include solutions for water resources, maximum utilization of land, multipurpose utilization of every inch of engaged area and opening of multichannel sources of income with minimum cost of making.

Keywords- Sustainable development, Agra Expressways, Sustainable Expressways

I. INTRODUCTION

The modern concept of sustainable development is introduced by 1987 Brundtland Report, It has been suggested that "the term 'sustainability' should be viewed as humanity's target goal of human-ecosystem equilibrium (homeostasis), while 'sustainable development' refers to the holistic approach and temporal processes that lead us to the end point of sustainability" [1]

Making Expressways is necessity for time saving of transport, travel, and to reduce pollution. But Expressways are the huge monsters to as they eat land and mostly agricultural land rapidly. But using a proper planning Expressways can provide important role in sustainable development. A sustainable expressway should satisfy lifecycle functional requirements of societal development and economic growth while reducing negative impacts to the environment and consumption of natural resources.

Agra-Lucknow Expressway – A Case Study

The basic fact of this expressway that this is a 302 km long route with an average width of 45.0 mt and so land engaged for this expressway is about 13,590,000 sq mt of almost all the fertile agricultural land. A proper planning of this type of expressway can be benefited more and may be made a way for sustainable development. By using cutting-edge technologies in design, critical habitats and ecosystems are protected from the encroachment of highway infrastructure.[2]

II. METHEDOLOGY

Sustainable Expressway

Sustainability in expressways should be addressed with the knowing that expressways are one part of transportation infrastructure, and transportation is one aspect of meeting human needs. On the other hand they should return to those things to nature what they used to make themselves such as land, agriculture, environment and place for people. The world is working on it. One such example is the Georgia highway, the long-term goal of which is to build the world's first sustainable road, a highway that could create its own clean, renewable energy and generate income by selling power to utility companies, while producing no stormwater runoff or other pollution and eliminating traffic deaths.[3] One such type of structure can be constructed of which a basic diagram of the development is shown below :

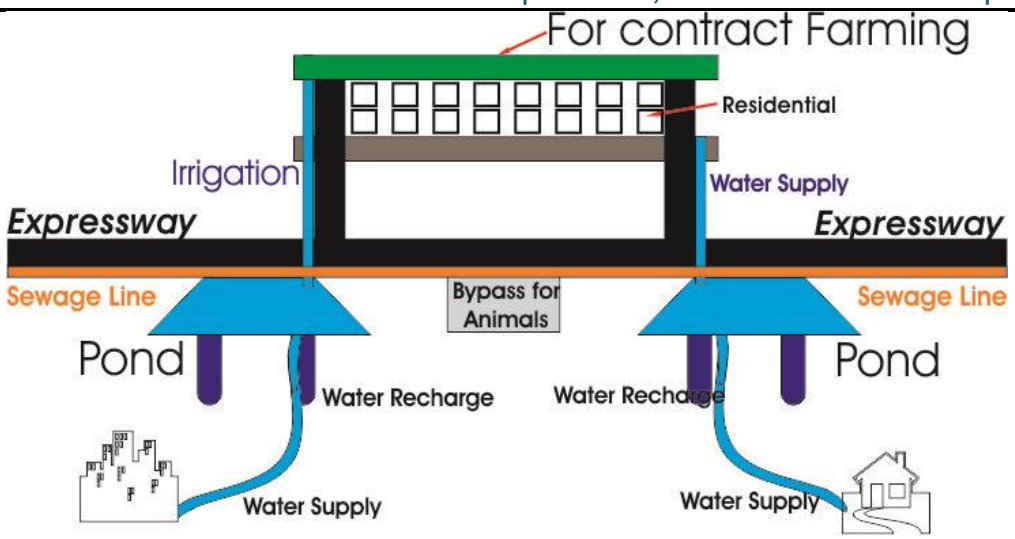

Fig.1

Note : A small part of farming land will be used for installing solar panels.

This model comprises an expressway which is simultaneously have a residential colonies and places for farming over it, ponds with water recharge systems under the expressway and a parallel sewage line. And so the model provided multiple facilities of human and nature needs.

III. RESULTS AND DISCUSSION

The Quantitative Analysis :

For 1 km of expressway,
Total area = 45000 sq mt (for an average width of 45 m)
60% area of the top (27000 sq mt) can be used for farming and it will made a colony of around 100 single storied houses of 160 sq mt (60% of below area of farming)
Water required for this colony = 146000 kl (@400/household/day)[4]
Pond size required for this water = 40m x 600m x 6m
Estimated Pond size sufficient for water (after adding 67% for water recharging, irrigation and outer use) = 40m x 600m x 10m
These ponds will cover 53% of below expressway area with 10m depth.
All the above construction costs will be covered by
1. Toll tax, 2. House tax/House sale, 3.Water tax and some other like agriculture tax and tenders of contract farming.
Need of Utilization Indicator : The utilization indicator (UI) is necessary before making a expressway. This will require to estimate utility of the expressway which will be the function of traffic density, colony need, water input & output, cost, land engagement. This is open for further discussion and resear

Discussion

Sustainability and green transportation initiatives should be widely promoted in expressway way design and maintenance. A newly constructed expressway must include solutions for water resources, maximum utilization of land, multipurpose utilization of every inch of engaged area and opening of multichannel sources of income with minimum cost of making.

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