POST -2015 MDG APPROACH TOWARDS ENVIRONMENT SUSTAINABILITY: A CASE STUDY OF VISHWAKARMA YOJANA

Varsha Raina [a], Indrajit Patel [b], Jagruti Hardik Shah [c], Jaydev Bhavsar [d]
[a, d] Civil Engineering Department , Birla Vishwakarma
Mahavidyalaya Engineering College, Anand, Gujarat, India.
[b] Structural Engineering Department, Birla Vishvakarma
Mahavidyalaya Engineering College, Anand, Gujarat, India.
[c] Vishwakarma yojana, Anand, Gujarat, India.
[a] Corresponding author: varsha05raina@gmail.com

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Abstract: The year 2009-10 was declared as the drought year for India. The cascading effects of the drought were felt everywhere as it lead to the contraction of G.D.P of the country. The agriculture sector being the most affected as it is monsoon dependent. In the future years the climate change phenomenon is going to make the matters worse as more prolonged monsoon and extreme drought period will be witnessed. The extremities of climate is going to affect the water demand and the supply of the nation and the world as a whole.

The present condition of water availability is inadequate to meet the growing demand of water. Hence there is a need to make the optimum use of the present water resources and to enlarge the water storage capacities based on the change in the climatic seasons.

Since 70% of India's population lives in the villages and hence the most affected. Therefore there is a need to put in the systems of water storage in the planning of the model villages. The planning and design of the government owned and even private buildings has been done so that it should be capable of storing water in the monsoon season and ability to use it all through the year.

Vishwakarma Yojana is one of the approach for rural infrastructure development based on the concept of providing basic sustainable urban infrastructure to the rural population. It plans to cover 70 villages of the Gujarat state. The working of the Yojana is based on the participatory approach towards the creation of community based assets of the village stakeholders with the involvement of the students of the designated colleges, thereby promoting and providing environmental sustainability in coherence with the Millennium Development Goals.

The methodology adopted in the identification of water-efficient buildings is the GAP analysis whereby the required infrastructure is seen as against the deficit one and then the requirement is estimated. The other approach is SWOT analysis wherein the villages were analysed from its strengths, weakness, threats and opportunities and then prioritizing its immediate needs.

The efforts towards the environmental sustainability have not been enough in its effectiveness, hereby emphasizing the need for its rebirth and paying greater attention towards it. In the current scenario when the confirmation of human activity as the cause of global warming has been done. The policy makers need to look at the conservation of water resources and its sustainability aspect too in view of the "take care" aspect of the future generations.

Keywords: Climate Change; Millennium Development Goals; Rural Development; Vishwakarma Yojana; Water

INTRODUCTION

In a country India where 70% of its people lives in villages and with the growing dynamics of the market led economy it is imperative upon the country to upgrade its rural infrastructure and too has to be done in a sustainable manner.

With a worldwide view of the utilization of the water resources, agriculture consumes nearly 70 pc of water consumption worldwide, industry 22 pc and household activities 8 pc. With just nine countries accounting for 60 pc of all available freshwater

supplies and Industrial use takes about 60 pc of water in rich countries and 10 pc in the rest.[1]

The fast pace of economic growth is placing increasing pressure on the ecological carrying capacity of the region. Signs of stress on the region's natural resources are already apparent. Now the challenge for the region is continuing its economic growth and reducing poverty, while ensuring environmental sustainability [2].

A shift towards environmentally sustainable economic growth or "Green Growth" would be necessary to continue economic growth while maintaining environmental sustainability.

Green Growth is an approach to pursuing the economic growth necessary for enhancing quality of life, while simultaneously minimizing the pressure on the environment's limited carrying capacity, by improving the eco-efficiency of our society as a whole structure, especially water, waste, energy, and transport infrastructure, is intimately and essentially intermeshed with economic growth, people's lives, and environmental sustainability. So far, discussions on infrastructure development have focused mostly on financing issues and engineering aspects. There is a need to also consider the long-term impact of infrastructure development on the sustainability and eco-efficiency of their economic growth. It is time to think differently about infrastructure development, taking into account eco-efficiency and resource conservation over the lifetime of the infrastructure.

The present rural infrastructure situation seems to be at the far end of the development on a sustainable basis. The Gujarat state one of the developed state owing to its strategic and geographical location is having an annual growth rate of 10.25% in 2001-11. Table 1 shows the overall growth of state. But despite is high growth numbers the human development index is a meagre 0.527 in 2008.

To tackle the issue of environment sustainable rural infrastructure development, the state has launched a pro-active scheme on the lines of integration of sustainable development with a preservation of habitat called the Vishwakarma Yojana in 2012. Vishwakarma Yojana is an approach for sustainable rural development based on the concept of providing basic urban amenities to the rural population. This "Design to Delivery" solution for development of villages has three focus areas that are Physical Infrastructure, Social Infrastructure and Renewable energy Infrastructure. It basic aim is to provide environmental sustainability in coherence with the Millennium Development Goals.

THE LINKAGE BETWEEN MILLENNIUM DEVELOPMENT GOALS WITH VISHWAKARMA YOJANA

The Millennium Development Goals conceived by the then United Nations General Secretary Mr. Kofi Annan in 2005 will be completing its decade long struggle in 2015 to fight the many aspects of development with a major focus on (a) To eradicate extreme poverty and hunger (b) To achieve universal primary education (c) To promote gender equality and empowering women (d) To reduce child mortality rates (e) To improve maternal health (f) To combat HIV/AIDS, malaria, and other diseases (g) **To ensure environmental sustainability** (h) To develop a global partnership for development.

OBJECTIVES

(a) To ensure the efficient use of rain water. (b) To construct of effective rain water storage facilities. (c) Creation of awareness of scarcity of rain water and rain water usage for household purposes. (d) To emphasize planning and design aspect of the rain water harvesting systems for buildings in villages.

Since these Goals are also being integrated in the country's national and state level planning, that is why Vishwakarma Yojana is conceived to act as a fire fighting tool on the above issues with our aim revolving around the concept of sustainable rain water storage.

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GUJARAT – A WATER SCARCE STATE

(a) One of the worst water scarce states in India with high variation in rainfall [3]. (b) The State was hit by three consecutive droughts from 1985-88 and again from 1999-2002. The year 1999 was one of the worst drought year of the century. (c) The State has only three perennial river namely Mahi, Narmada and Tapi in Central & South Gujarat. The variation of Fresh water availability is shown in Figure 1.

Table 1: Growth Details of Gujarat State

Aspects	**Growth Rate**
Geographical Area	6% of India (2.00 lakh sq kms)
Population	5% of India (60 million)
Urbanisation	42.6%
GSDP constant prices (2009-10)	7.38 % of India (Rs. 3,31,633 crore)
Per Capita Income (c. pr-US$ (2009-10)	1349 (India Average- 980)
Industrial Output	16% of India
Agri Growth Rate (2000-2010) CAGR	10.97%

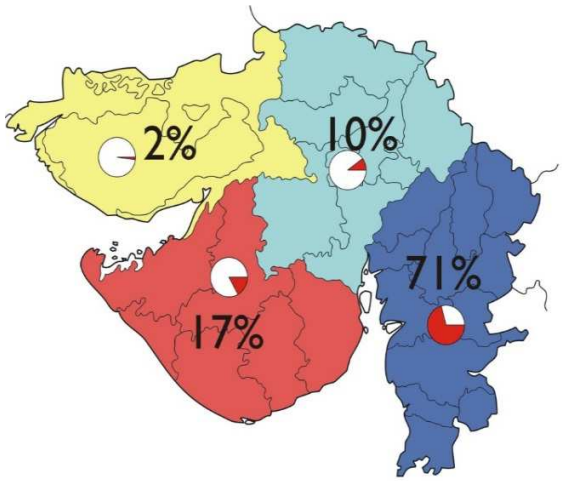

Figure 1: Fresh Water availability in Gujarat State

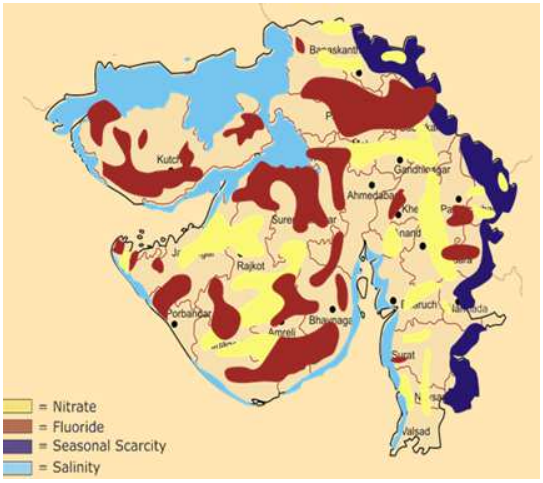

Figure 2: Problems of Drinking Water

(d) Saurashtra, Kachchh, North Gujarat and Panchmahal areas of Gujarat State are facing acute water scarcity throughout the year as in these areas the rainfall is scanty and there is no perennial river. (e) The underground sources are not adequate to cater the drinking water demand to overcome the drinking water supply problem. (f) Ground water table is depleting @ 3 to 5 Mtrs. depth every year. (g) 74% of the State area is unsuitable for ground water withdrawal due to rocky terrain and coastal region. (h) In most of the districts ground water contains excessive fluorides, nitrate & salinity. (i) Most of the Saurashtra region comprises of hard rock where ground water is available from cracks and crevices. (j) Ground water on the coast is saline with salinity ingress into the land areas. (k) Except South Gujarat, paucity of water in rest of the State

Drinking water scarcity felt in almost 2/3rd part of the State as shown in Figure 2. The study area of the Vishwakarma Yojana is limited to Gujarat State. 41 out of 70 villages were selected for the provision of the rainwater harvesting systems, lake developments, watershed managements and artificial water recharges to mitigate the effects of water scarcity. A two pronged approach was adopted with the first being identification of existing public buildings with a large terrace area so that sufficient rain water could be collected to meet the water needs at least during the monsoon season and then converting them into rain water harvesting buildings. Second, being constructing new public buildings such as public toilet blocks with an aim to combine the aspects of provision of eco-sanitation facilities and the efficient use of rainwater.

METHODOLOGY AND IMPLEMENTATION

A Techno-Economic Survey as a part of data collection of all the 70 villages by the students involved in cooperation with the village heads and the local community was carried out. After the survey a Gap Analysis was done which identified the inadequate infrastructure as in comparison to the adequacy required for a normal healthy life and as per the guidelines. On the basis of the survey 41villages were identified for the provision of the rain water harvesting systems.

The SWOT analysis was carried out in respect of providing which renewable energy source is suitable such as high rainfall areas should have a provision of rain water harvesting building whereas the north western part of the state having high intensity of sunlight should have a provision of the solar street lighting and central region with large cattle population was selected for bio-gas generation and waste to energy plants.

Table 2 shows the 41 villages having a provision of rainwater harvesting systems including revival traditional water bodies [5].

Table 2: Villages Having Rain Water Harvesting Buildings

District	Village	District	Village	District	Village
Anand	Tarapur	**Kheda**	Matar	**Gandhinagar**	Randheja
Ahemadabad	Mandal	**Bharuch**	Valiya	**Junagadh**	Mandarda
	Detroj		Jagadia		Bhensan
	Ranpur		Vagra		
Banaskatha	Dujodar	**Panchmahal**	Goghamba	**Patan**	Sami
	Shihori		Jambughoda		Varahi
	Vav		Morava		
	Ambaji		Kadana		
	Vadgam		Bakor		
Kutch	Nakhatrana	**Mehsana**	Satlasana	**Sabarkatha**	Malpur
	Mundra		Gojariya		
	Naliya		Bechraji		
	Dayapar				
Surendranagar	Lakhatar	**Valsad**	Kaprada	**Surat**	Kamrej
	Sayla				Olpad
	Muli				Palsana
	Chuda				Chalthan
					Kosamba

DESIGN PHILOSOPHY

From the Gap analysis, development strategies have been proposed and designed by keeping the following parameters in mind like built and landscape into a cohesive whole, water charging or reuse as integral part of the design process. Major thrust into local /regional species, low energy intensive, low maintenance creation of sustainable development in tune with sun ,water ,soil ,introduction of alternate energy sources, generation of an effective reuse and recharging the water basin ,introduction of separate systems of distribution network for raw water and drinking water[4].

RESULTS AND DISCUSSION

The provision of rain water facilities in existing public building and construction of new building is a step towards essential water distribution. The artificial recharge and the renovation of traditional water bodies is a step towards ensuring water sustainability in the wake of increasing groundwater mining.

The creation of artificial pond development/lake development in the villages is done to mitigate the effects of climate change as well as it is for the creation of community owned and developed assets which will also ensure the needs of cattle and livestock and help in livestock management of the area. The watershed development can be integrated with the rain water harvesting where the geographical conditions are suitable for it. This will also enhance the agricultural productivity of the region.

CONCLUSIONS

This study demonstrates that the basic aim of sustainable development is the incorporation of the long range planning which must take place in a public forum, with opportunities for public participation, if it is to be representative. The concept of environmental sustainability is embedded in this approach of rural infrastructure development. The provision of renewable energy like solar street lights, rainwater harvesting systems and bio-gas plants makes this as an attractive approach towards

sustainable development as there are ample opportunities in the availability of natural resources. The provision of introduction of other green systems such as Eco-Sanitation, Root Zone Technology, Waste to Energy systems also contribute in conservation of water resources and thus finally helping in the achievement of environmental sustainability at the grassroots level.

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ABOUT THE AUTHORS

Name: Varsha Raina
She is a Research Scholar currently pursuing Master of Engineering (M.E.) in Construction Engineering Management at B.V.M. Engineering College and currently doing her thesis on Construction Project Planning for Sustainable Rural Infrastructure Development under Vishwakarma Yojana in Gujarat State
Mailing address: 6/2, Royal Palace Society, Vallabh Vidyanagar, Anand
Tel: 9426468078
e-mail:varshar05aina@gmail.com

Name: Prof. (Dr.) Indrajit Patel
He is having more than 25 years of experience in Structural Engineering field. Currently working as a Professor in Birla Vishvakarma Mahavidyalya Engineering College. He is also the Hon'ble Director of the Vishwakarma Yojana.
e-mail: inpatel34@gmail.com

Name: Ms. Jagruti Shah
She is pursuing PhD in Rurban Planning from NIT-Surat. She has done M.Tech in Urban Planning and is an Urban Planner by profession. She is Project Coordinator of Vishwakarma Yojana since its inception.
e-mail: jagruti@gtu.edu.in

Name: Prof. Jaydev Bhavsar
He is an Associate Professor in the Civil Engineering Department in the Birla Vishvakarma Mahavidyalya Engineering College with a teaching experience of more than 30 years.
e-mail: jjbhavsar@bvmengineering.ac.in