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TO ANALYZE FUTURE WATER DEMAND FOR INDRAYANI RIVER BASIN – A REVIEW WORK

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Abstract

Water demand prediction at an appropriate spatial and temporal resolution is essential for planning water supply systems.To provide the remedial measures to crisis of the water which is due to the population growth in future.To increase the water quantity, provide suitable structure like dam, water reservoir,etc.Monitoring the water distribution system according to availability of water. The estimation of the water demand by using the rainfall data, population data, groundwater data, and the standard water requirements from IS 1172-1993 for residential zone,industrial zone and agricultural zone,etc by providing a standard growth factor. The standard methods of forecasting of population are used to calculation of future three decades population using past three decades population. The aim is to provide the better stabilization between the future water demand and rapid urbanization. The results should be such that they should be useful for minimising the scarcity of water and management of the water supply systems for present and future suitutation according to the rapid urbanization. The results should be such that the water required for developed sector should be available at required quantity.

I. INTRODUCTION

Supplying water to the population between now and 2045 from an minimum supply is identified as a significant challenge. This is due to the fact that only one percent of the world's total water is fresh and drinkable and is poorly managed.World population continuesly increasing and also the demand for water. Increasing pressures to meet urban, agricultural and environmental demand will have an impact on available resources. Globally around 70% freshwater is used in agriculture, 22% in industries and 8% domestically. While

population growth is a key factor affecting water scarcity, improving living standards, rapid urbanisation and supply variability due to climate change increases the water scarcity in different parts of the world. India is a developing country and the urban population is expected to grow rapidly over the next 30 years. India has experienced prolonged and severe drought conditions from 2008 to 2012 , in some part of the country. Producing enough food and providing safe drinking water to a growing population is going to be very difficult task in the years ahead.

Indrayani river originates in the Western Ghats near Lonavala and passes through Kamshet, Talegaon, Dehu, Pimpri-Chinchwad and Alandi while later meeting the Bhima river at Tulapur.Water demand is the quantity of water that must produce in order to meet all water needs in the community.It follows a course mostly north of the city of Pune It is revered as a holy river and is associated with such great religious figures such as Sant Tukaram and Dnyaneshwar. There is a hydroelectric dam called Valvan Dam on the Indrayani at Kamshet.

II. LITERATURE VIEW

A. Micro & Macro Watershed Management Using Remote Sensing and GIS Software for Talegaon Dabhade., as per Upendra R. Saharkar, D. D. Kulkarni, Amruta A. Pore. - Prioritization of micro watersheds and selecting the most severe one for micro watershed management.

B. Water demand and severity of water stress., as per Yoshihide Wada, L. P. H. Van Beek , Daniel Viviroli ,Hans H. Dürr, - This paper assesses global

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water stress at a finer temporal scale compared to conventional assessments.

C. Drawing Water for Thirsty Lands Stories of the Closing Krishna River Basin in South India. As per, Jean-Philippe Venot.- This paper quantitatively describes the process of closure of the Krishna basin over the last fifty years.

D. Transpiration rate response to water deficit during vegetative and reproductive phases of upland rice cultivars., as per Alexandre Bryan Heinemann; Luís Fernando Stone; Nand Kumar Fageria.- The use of drought tolerant cultivars is the most promising strategy to minimize the effects of water deficit on upland rice growth and productivity during the rainy season.

E. Negotiating our way through Livelihoods and Ecosystems: The Bhima River Basin Experience., As per - Prof. Vijay Paranjpye and Ms. Parineeta Dandekar. - This paper aims to strike a balance between use of resources for livelihood and conservation of resources to sustain their functions for future generations.

F. Agricultural groundwater management in the Upper Bhima Basin, India: current status and future scenarios., As per , L. Surinaidu, C. G. D. Bacon, and P. Pavelic. - The basaltic aquifers of the Upper Bhima River basin in southern India are heavily utilized for small-scale agriculture but face increasing demand-related pressures along with uncertainty associated with climate change impacts.

G. Hydro-economic modelling of the Upper Bhima Catchment, India., as per Gartley, M.L.,B. George,B.Davidson ,H.M.Malano and K. K. Garg . - This paper focuses on the hydrologic and water allocation analysis of the basin and the economic consequences of different water allocation policies.

H. Real Time Streamflow Forecasting and Reservoir Operation System for Krishna and Bhima River Basins in Maharashtra (RTSF & ROS)., as per Guna Paudyal , Finn Hansen , Gregers Jorgensen, Dhananjay Pandit. - Consultancy services for the implementation of streamflow forecasting and reservoir operations for Krishna and Bhima River Basins in Maharashtra.

I. Closing of the Krishna Basin: Irrigation, Streamflow Depletion and Macroscale Hydrology. As per Trent W. Biggs, Anju Gaur, Christopher A. Scott, Prasad - This document summarizes the physical geography, agriculture, land use, hydrology, and environmental issues of the Krishna Basin.

J. Seasonal Demand Dynamics of Residential Water End-Uses. As per Kumudu Rathnayaka, Hector Malano,Shiroma Maheepala,Biju George,Bandara Nawarathna - The study discusses shower and irrigation water use in detail as end-uses that have seasonal variability.

K. Assessing water security across the Krishna River Basin. as per -Yee,M.S.,BA. George, B. Nawarathna1 - Water extractions for agriculture, industrial, and domestic uses continue to grow to support one of the fastest developing regions of peninsular India.

III. EASE OF USE

A. Reduction in storage :-

Reduction in storage of water due to the water demanding activities such as rapid industrialization, agricultural use, overuse of residential and domestic water, over wastage of water, standard of living, growing urbanisation.

B. Lowerage of water table :-

Overdrawing of the groundwater from well, borewells, tubewells,

C. Scarcity of water :-

Overuse of water, rapid Industrialisation, unavailability and water source, climatic condition, etc.

D. Increasing population :-

Increasing Migration, growing birth rate.

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IV. SCOPE

A. Water demand analysis will be useful for present and future water management systems for area which uses the water of Indrayani river.
B. Water scarcity should be somewhat minimised.
C. To get an effective idea about increasing the storage of water for future use of water by constructing storage structures.
D. The conclusion of the project will be useful for the stabilization of the future water demand and rapid urbanisation.

V. OBJECTIVE

A. With the help of literature review, to find out different method for identification and measurement of water demand.
B. To Collect the data regarding water demand.
C. To Analyze the past, present, and future water demand.
D. To Suggest/Remedial corrective methods to meet the future water demand.

VI. STUDY AREA

Study area (fig.1) for this project is located in maval taluka, pune district of maharashtra state. This area lies between latitude 18.7546on, 73.4062oe and longitude latitude:18.625on, longitude:73.9149oe. It is about 120 km from mumbai and 35 km from pune. It mainly includes talegaon dabhade city,chakan midc, alandi, dehu, akurdi and rural. Area of macro watershed is 102sq.km total study area is of length 71 km.

Fig.1: Study area

VII. METHODOLOGY

A. To Collect Papers, books for Literature survey.
B. To Collect the population from 1991 to 2011
C. To Collect the rainfall data from 2000 to 2017
D. To Calculate Water demand as per IS standards upto 2045
E. Forecasting of population.
   1. Aritmatical increase method.
   2. Incremantal increase method.
   3. Geometrical increase method.
   4. Graphical representation method.

VIII. DATA COLLECTION

A. Topo sheets of No E43H9,E43H10,E43H14 and E43H15 are collected from Survey of India, Pune.
B. Population data of project area is collected from reports of the Registrar General and Census Commissioner of India.
C. Rainfall data of nearest rain gauge stations are collected from Indian Metrological Department, Pune.
D. Ground water data is taken from reports of Central Ground Water Board, GROUNDWATER SURVEY AND DEVELOPMENT AGENCY.

IX. EXPECTED OUTCOME

A. Future water demand of water.
B. Water scarcity management.
C. Stabilization between future water demand and rapid urbanisation.
D. Management of water supply systems according to increasing water demand.
E. Remedial measures to avoid the closure of indrayani river basin.

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