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Rejuvenation of Water Bodies by Widening of Nallahas for Ground Water Recharge and Irrigation System at Very Low Cost-A Review of Literature

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Abstract: ***Maharashtra has constantly confronted dry seasons. The dry spell has endured for four year back to back years and has influence significantly on drinking water security and harvest creation and profitability seriously everywhere throughout the Maharashtra states. In India groundwater is only the source of irrigation in the area where the canal irrigation is not adequately developed. Monsoonal rainfall in India is not always reliable to successfully grow crops, therefore farmer in many parts of India depends upon groundwater to save rainfed crops. The new concept of drainage deepening and widening can be proved to be successful where weathered strata and clay over burden is present which restricts the ground water percolation. This has been applied to various villages in Maharashtra like Chacher, Virsi, Watoda, which has been facing acute shortage of water since long time. After taking the structure of drainage deepening and widening adequate water for irrigation and increasing the ground water. Government of Maharashtra has sanctioned this project with the collaboration of Art of living Organization. The project is successfully working and the people of village get benefit of it.***
Keywords: Nallah Widening, Irrigation, Crops, Rejuvination.

I. INTRODUCTION

Water scarcity has become a major problem specially in most aired region of the world which ultimately affect food scarcity, natural ecosystem, plant and human health. Ground water recharge is the replenishment of an aquifer with water from the land surface. Majority of rural water supply schemes are based on groundwater and hence to enhance the sustainability of such water supply, ground water recharge becomes imperative, especially in case of over exploited areas. The main objective of the nallah deepening and widening is to check whether there is increasing the level of ground water or not. It also provides a source of drinking water, control floods, support biodiversity and provide livelihood opportunities to a large number of people. This work can meet the raising demand for the water augmenting and improving the health the water bodies.

The site which have been studied are Chacher, Virsi and Watoda in which Chacher is second in Maharashtra after Shegoan for large area crop production so it needs more water. But in last 4-5 years in Maharashtra the scarcity of water make the people of this area and their crop fields in danger. So the Government of Maharashtra and with the collaboration of Art of living foundation rejuvenate this area and brings hope for them.

II. LITERATURE REVIEW

In his work the author has studied the Serowe region is a semi-arid egion in the eastern fringe of Botswana Kalahari. Groundwater from the Ntane Sandstone aquifer is the main source of water supply for this region. Recent declines of groundwater levels especially in the existing wellfields areas are attributed to the increase of groundwater abstraction has increased attention in proper understanding and quantification of the groundwater resource with surface and unsaturated zone water as depicted in their paper “Modeling groundwater resources of the eastern fringe of Botswansa Kalahari: integrated numerical groundwater flow model” by Daniel Teka Berhe (2017) .

This study of Cohesiveness Oral Tradition and Tradition Write: A Case Study on Expansion Events and Figures Gajah Mada of Majapahit in East Aceh Sention by Mufti riyani (2018), intends to determine the extent to which these oral traditions intersect with historical events and how the myths that developed in the community Tamiang and Perlak as well as in border areas that show the name identification that was related to the events of the expedition and the name of Gajah Mada of Majapahit. Folklore, myth, and the story are the reduction process of the oral tradition that developed and influential in the lives of today.

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There is growing need of basements, subways and other underground excavations in congested cities as suggested by DK Kanhere, RA Hegde, VT Ganpule in there paper on Meter panel construction, an innovative solution for basements, subways and river training works(2013). Considering proximity of other structures and traffic problems open excavation may not be always feasible. Panels of small width, forming a wall are constructed along retention periphery, adequaely designed as cantilever sheet piles and anchored in substratum to achieve atability against various forces may be adopted here. The particular problem is studied by the author in the present study and equations developed for stability considerinn passive pressure and balancing couple by trial and error method , the results are verified with analytical model (FEM).

In the paper (4) by Ahmed F Yousef (2013) the author caried out research on Nubian Sandstone aquifer system is one of the largest aquifer in North Africa and overlying fractured carbonate aquifer system. They are affected by intensive human and governmental activities espescially in the nothern Nubian shelf for drilling a lot of shallow and deep water wells in different development purposes. The ain of the work in following up all the actives with time, and their impact on the hydrogeological and hydrogeochemical situation as well as prediction the future condition of the groundwater aquifer systems in the area.

The Barton Springs segment of the Edwards Aquifer is an important water resource for municipal, industrial, domestic, recreational, and ecological needs as stated by Brian B Hunt, Brian A Smith (20014). Recent studies have given us a better understanding of the amount of groundwater that will be available during a severe drought with increased demand. This paper describes the methods used to characterize and quantify the impacts to water-supply wells during drought-of-record conditions (eg, 1950s) and with increasing demand on groundwater. In the first section of the article by Peter Csatho, Laszlo Radimszky (2009), factors affecting the magnitude of mineral and organic nitrogen- phosphorus (NP) use, such as per capita gross domestic product (GDP) and population density, are discussed. Nutrient balances, especially those of N and P are important fenvironmental indicators. In recognition of their importance, the countries belonging to the Organization for Economic Co-operation and Development (OECD) group have an obligation to submit yearly calculations on soil surface N and P balances.

The San Pedro River of southeast Arizona is a north-flowing tributary of the Gila River. The area of the drainage basin upstream of the 40-km-long study reach is about 3200 km.This study traces the historical evolution of the San Pwdro River channel specifically, the deepening,widening, and sediment depostion that have occurred since 1900-and it aims to evalute the causes of channl widening and deeping, the rate of widening and the present stability of the channel. Alluvium of the river valley consists of upper holocene pre-and postentrenchment deposite.the pre-entrechment terrace of the inner valley, accumulated between about AD.1450 and 1900 in a relatively sluggish, lowenergy fluvial system with extrenstive marshy reaches and high water table depicted in their paper by Richard hereford (1993).

Pachkore and Prabat 2017 studied that Jalyakta Shivar Abhiyan (JYS) is the government of maharshtra's program to proived water for all and make village freem from water scarcity. Maharashtra has been witnessing incresing agriculture and drinking water stress in recent years.Maharashtra has launched a new program named 'Jalyakta Shivar Abhiyan (campaign) in a bid to make maharshtra a drought free state by 2019. The JYS promotes a framefwork for village level water balance calculation which includes estimation of crop water requirement, drinkung water stress etc.

In this paper the authors have quantified some benefit of making more room for river was originally advocatted because it 1) reduced the consequence of flooding 2) reduce the probability of failture of the embankment the impleament of more than 30 intervention along three Rhine river branche has now just been finished, resulting in the lowering of the 1:1250 per flood level by 0.3 m on average by among other things.

Authors have shown the need for improved flood risk management along the Rhine and Meuse river. The aim of IRMA – SPONAGE was the development of method and tools to assess the impact of flood risk reduction measurment and of land use and climate change scenarios, in order to support the spatial planning process for the Rhine and Meuse River basine, the outcomes of the programme are therfore relevent to flood risk management in the entire Rhine and Meuse basine.

This paper assessed the loss of river processes and ecosystem under changed hydraulic region post river front development project. The paper argues that due heavy channel engineering led riverfront development and other related morphometric change.this study can provide valuble insight for future project on riverfront development and restoration measures in india and elsawhere.

To meet the rising demand for water, augmenting and improving the health of water bodies and also rejuvenation of water bodies in cities and rural areas is of most important. The author Paridhi Rastogi and prof. S.K. Singh (2016-17) studied the several surviving ancient structure like stepwells, small check dams and tanks that display the traditional wisdom of storing water where it falls. The Fact that view along with a decrease the availability of water resources point to a systematic flaw that can be tackled in a manner of ways. He concluded that the project like this can be a medium through which the general populace can be educated about the need to review water bodies.

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The author Shashank Shekar (2014) showed that the Environmental and River rejuvenation project that the ecological function of the river is linked to the hydrological variation. In the river flow, a process based understanding of the river ecosystem will facilitated sustainable exploitation of this resource. The environmental flow concept help us in deciding a sustainable limit to river resource development. In case of river system, in poor river health, river rejuvenation can also be achieved by broadly aiming at restoring assured environmental flow in the river system. The planners and policy makers should necessarily integrate the concept of environmental flow with water resource development strategy.

In there project of rejuvenation of water bodies by ground water recharging practices in catchment area, revealed that the crop production in India is characterised by the low input low yield concept and rainfed agriculture by Manoj P. Samuel, A C Mathew of Kerala. The rainwater and runoff in the form of a spring or stream can be harvested using simple and eco-friendly low cost technologies. The study suggested that the technologies are sustainable locally adoptable cost effective and affordable to the farmers. This study also revealed that the rejuvenation of the traditional water harvesting structures in the district and the implementation of community water management schemes with maximum people's participation are the suitable options to mitigate all the ill-effects of drought and soil erosion prevalent in the area.

In the project by Manish S. Deshmukh and khadri SFR (2012) Amravati the new drainage deepening and widening for ground water recharge, the work explained that the direct precipitation is the main source of ground water recharge additional recharge takes place from water conservation structure constructed. The area is devoid of peroneus stream. The ground water occurs under water table condition in alluvium and vesicular trap in shallow depth zone. The aquifer is unconfined and the single aquifer system exists. The water requirement of the crops in the village, imbalance in the ground water recharge and withdrawal condition has been observed. Drainage deepening and widening solved drinking water problem and irrigation.

Rapid industrial development, urbanization and increase in agricultural production have led to increased ground withdrawals, resulting in freshwater shortages in many part of the world. In view of this, greater emphasis is needed on the studies focusing on the sources and impacts of groundwater recharge. The objective of assessing the groundwater recharging and the impact on the groundwater quality of Roorkee town with a special consideration of the portion of the Upper Ganga Canal (UGC) passing through the town area.

The surface topography of the study area indicates a mild gradient from west to east but, the main slope was deserves along north-west to south-east direction, roughly parallel to the river solani. Groundwater forms the most important source of portable water, as it is believed to be safe, free from pathogenic bacteria and suspended matter as told by Hussain musa Hussain ,D.C . Singhal, H. joshi1, M.S. Rao, B.kumar and S. kumar, Ministry of Higher education and scientific Research, Baghdad, Iran.

A Review on Managed aquifer recharge by check dams: A case study near Chennai, India author objective in this paper is to present a review of research work carried out on the impact of check dam in improving the groundwater quantity, quality and livelihood of people. In through check dam is found to be one of the eficient method to improve the groundwater head and quality. The case study carried out near channai is an evident that check dam has increased by groundwater level upto 1.5m. The MAR by check dam can be considered as a best option for effinient & sustainable management of groundwater resources.

David walker, Geoff parkin, Petra schmitter in there paper Insights From a Mutti-Method Recharge Estimation comparison studied the additional, value that can be gained fron multi-method recharge studies through insights into hydrogelogical understanding in addition to characterizing uncertainity. This study demonstrates that even when assunption behind methods are violated as they after are to some degree especially when data are limited valuable insights into the hydrogeological system can be gained from application of multiple methods.

This paper presents an inverse modelling approach to quantify the recharge contribution from both an ephemeral river chammel and an introduced artifical recharge system based on flood-water spreading in arid Iron. The result show that by expanding the atificial recharge system the recharging volume can be increased even for small flood events while the recharge throjubh the river channel increases only for major flood events. In a normally year without extreme events, the floodwater spreading system is the main contributor to recharge with 80% as suggested in the paper Natural vs Artificial groundwater recharge quantification through inverse modeling by M.Hashemi, R. Berndtson, M. Kompani-zare

This is an approach to is establishing the spatial and temporal amounts of the three urban recharge sources is developed and illustrated using the Nottingham (UK) urban aquifer.

A calibrated solute balances for three conservative species thus providing source lines of evidences to use in the recharging estimation. The wide confidence intervals resullts from the scaicity the historical field data and the long turnacer tine in this high volume aquifer and should be significantly lower for many other aquifer system.

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III. CONCLUSION

The direct precipitaion received in the area is the main source of ground water discharge for the villages. But these area were facing acute drinking water scarcity every year due to insufficient rainfall and slowly the water table is also going down and down. So the insufficient requirment of water for crops. The widened nallah were the only solution to increase the catchment of water in the mansoon season and reachage of the ground water. So its an most economical and feasible solution at the present and hence from the above studies of literature review paper our project work will take the case study of some area in and around nagpur region and implementation of the same so that the result will be fruitful to the villagers.

REFERENCES

[1] Alcams J.& Bennett, E.M. (2003). Ecosystems and their services. Ecosystem & human well being: A framework for assessment, 49-70.
[2] Brian B Hunt, Brian A Smith ”Groundwater Availability during Drought Conditions in the Edwards Aquifer, Hays and Travis Counties, Texas” GCAGS Transactions, 2004
[3] Bower H. (2002). Integrated water Management for the 21st century: problem and solution journal of Irrigation and drainage Engineering 128(4), 193-2020
[4] DK Kanhere, RA Hegde, VT Ganpule “Meter panel construction, an innovative solution for basements, subways and river training works “International Journal of Sturctural and Civil Engineering Research, ISSBN, 2319-6009,2013
[5] Horton, R.R.1945. Erosional development and their drainage basis: A hydro physical approach to quantitative morphology. Bull. Geo. Soc Amen, vel 56 page 275-370
[6] IWMI (2005) water policy Briefing, Environmental flows. Planning for environmental water allocation, Report, international water management Institute, Shrilanka P.8 http://iwmi.cgial.org/publication.in.
[7] Peter Csatho, Laszlo Radimszky “Two worlds within EU27: Sharp contrasts in organic and mineral nitrogen-phosphorus use, nitrogen-phosphorus balances,m and soil phosphorus balances, and soil phosphorus status: Widening and deepening gap…” Communications in Soil Science and Plant Analysis 40(1-60),999-1019,2009
[8] Richard hereford “Entrenchment and widening of the upper San Pedro river-Arizona” Geological society of american,1993
[9] Singha C.P. & Raghuwashi ,C.S, 2000 Sustainable integrated waterhead. Management & the community effort for the same in the north-east region of India, ICIWR<-200 per of international conform Integrated water resource management for sustainable development, Dec. new Delhi, India, page 991-918

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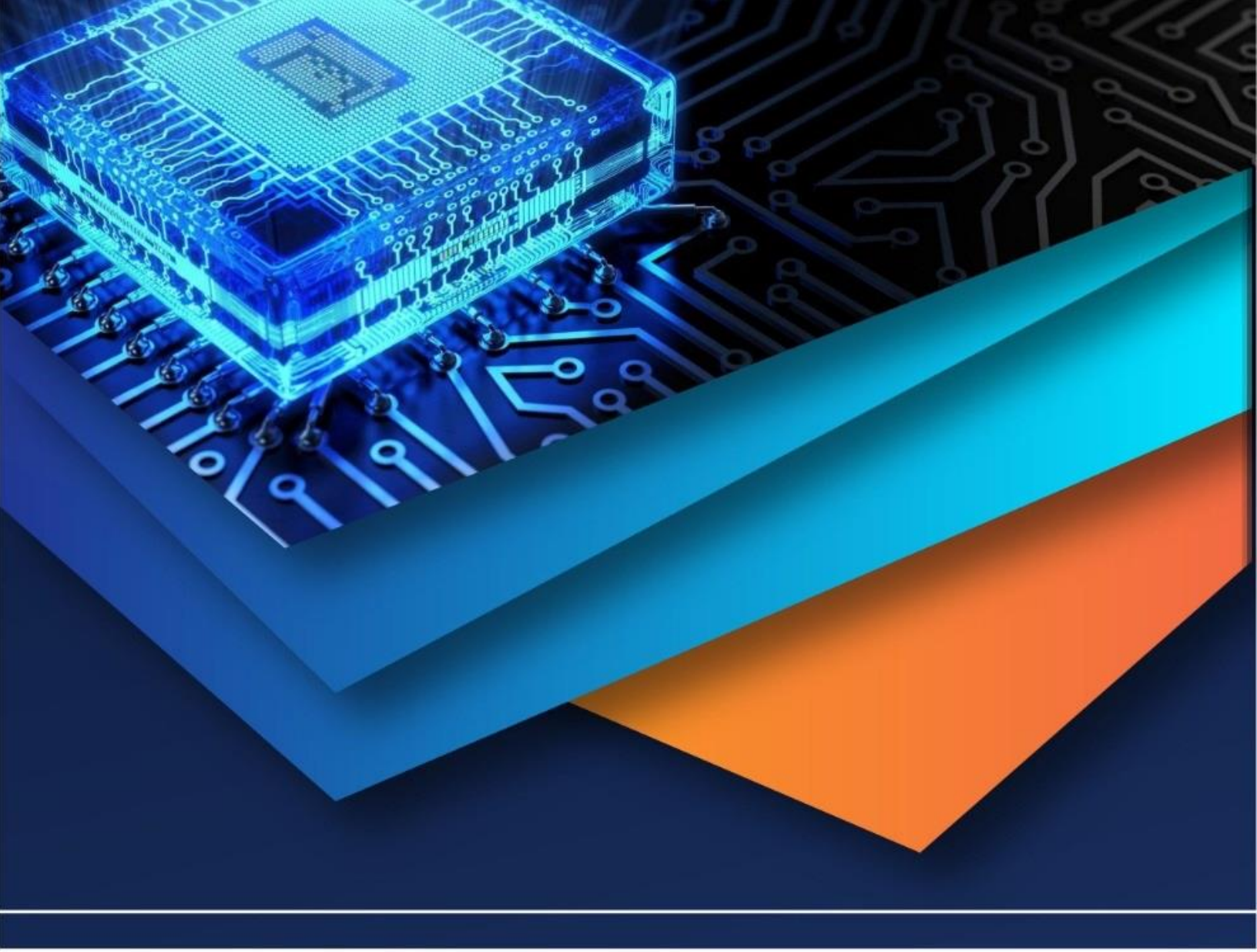

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