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DROUGHT MANAGEMENT BY ECONOMICAL BANDHARA

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ABSTRACT

The agriculture industry is the backbone of the Indian economy, accounting for a significant portion of the country's GDP. Agriculture losses have increased in recent decades as a result of monsoon irregularities and changes in meteorological conditions across the Indian subcontinent. Maharashtra is the most developed and industrialised state in the country, with the biggest GDP contribution to the Indian economy. The current study examines the impact of droughts on the environment, agriculture, and socioeconomic position in Maharashtra from 2011 to 2016. The state accounts for half of the drought-prone area. The state experiences a rainfall deficit once every 5 to 6 years, and severe drought conditions once every 8 to 9 years. From 2011 to 2015, the percentage of regular rainfall in Maharashtra state has gradually decreased. It demonstrates considerable geographical variability in rainfall across Maharashtra throughout the year, confirming that the divisions of Marathwada, Nashik, Amravati, and Nagpur experienced less rainfall in 2014 and 2015. From 2012 to 2015, the Aurangabad division has the lowest water availability in Maharashtra's reservoir. The entire agricultural produce in the Kharif and Rabi seasons has declined significantly in 2014-15, with a near 50 percent shortfall in pulses, oilseeds, and cotton compared to the previous year. Individuals and communities in the Cotton Belt divisions of Aurangabad, Amravati, and Nagpur are under strain to cope with drought and its repercussions. In comparison to the years 2011 to 2014, there were more farmer suicide instances recorded in 2015.

Keywords: Drought Management, Bandhara ,Water Storage, Rainfall, Economical Bhandhara.

I. INTRODUCTION

Drought is a transient occurrence, as opposed to aridity or even seasonal aridity (in terms of a clearly defined dry season), which is a permanent component of climate. Drought, on the other hand, is a recurring but occasional aspect of climate that occurs in all climatic regimes and is often characterised by fluctuation in terms of geographic extent, severity, and duration. A lack of rainfall causes soil moisture to be depleted, as well as a drop in surface and ground water levels, which is likely to have a negative impact on agricultural productivity. Drought has far-reaching consequences that affect many areas of the economy. Because agricultural productivity and water supplies are essential to our ability to generate products and services, the repercussions are felt well beyond the places directly suffering the onslaughts of physical drought. To decrease risk, the following goals were devised. Controlling harmful runoff and deterioration, and thereby conserving soil and water. To manage and use runoff water for beneficial purposes. To maintain, maintain, and enhance the land of a watershed in order to increase the efficiency and sustainability of output. Water is properly stored with provisions for usage during dry seasons in low rainfall locations. It also aids in flood mitigation.

Figure.1 Drought

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II. LITERATURE SURVEY

1. Abhisekh Saha, Sreedeep Sekharan, Uttam Manna Soil and Tillage Research 204, 104736, 2020[1]

Drought is one of the greatest natural calamities that may harm a country's economic, social, and environmental situation. Long-term drought has an impact on the soil ecology, causing desertification and deterioration of soil health. This causes significant water stress, which is exacerbated by inadequate water management, inadequate irrigation practises, soil degradation, and soil with inadequate water retention capacity. During a drought, effective land management is the most practical approach.

2. Hans Bressers, Nanny Bressers, Corinne Larrue[2]

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3. Eugene Z Stakhiv, William Werick, Robert W Brumbaugh Water Policy 18 (S2), 122-152, 2016[3]

The evolution of national and federal drought policies in the United States (US) is explored, and the relative efficacy of the hierarchy of federal, state, and local drought management programmes and practises is reviewed in the context of evolving water management ideologies. While no 'national' drought management strategy exists, there is a strong federal policy that aims to coordinate the management responses of multiple government agencies. Drought and flood control are critical components in ensuring national "water security."

4. A Grobicki, F MacLeod, F Pischke Water Policy 17 (S1), 180-194, 2015[4]

The study advocates for an integrated strategy to the management of water-related catastrophes that is incorporated into the political decision-making process as soon as feasible and focuses on preparedness, limiting negative consequences while also recognising positive consequences, notably those of floods. This allows us to analyse the three pillars of sustainable development and comprehend the alternatives available as well as the trade-offs that may need to be made between economic efficiency, environmental sustainability, and social equality.

5. Zbigniew W Kundzewicz, Kuniyoshi Takeuchi Hydrological Sciences Journal 44 (3), 417-432, 1999 [5]

There have been several disastrous floods in various places of the world during the previous decade. Despite significant investment in flood protection projects, neither flood occurrences nor damages are reducing. Climate change may result in an increase in the frequency of extreme weather events that trigger floods. Some recent major floods in the world are discussed, as well as Japan's flood-fighting experiences.

III. METHODOLOGY

A. Problem Statement

The goal of this project is to construct a low-cost bandhara for ground water recharging. The expected cost is less than one-tenth of the cost of the concrete bandhara. therefore we may create ten bandharas in different areas for the same price as a single concrete bandhara

B. Objective

- To investigate the real ground water recharge system on specific locations.
- The price of the projects.
- The introduction of our innovative tyre-type bandhara concept.
- Construction costs for tyre type bandhara and cocrete bandhara are compared.
- Both the bandhara's design strength is compared.
- Designing a bandhara at a fraction of the cost of a concrete bandhara.
- Giving these bandhara designs to the grampanchayat of the site area.

C. Description

Maharashtra state is located in Western and Central India and has a geographical area of 3, 07, 713 square kilometres. It is delimited by latitude 150 40' and 220 00' N and longitude 720 30' and 800 30' E. The state features a 720-kilometer coastline on the Arabian Sea. Karnataka, Goa, Madhya Pradesh, Gujarat, and Telangana are the states that share its borders. The state is separated into three geographical regions: Kokan (coastal area), Western Ghat (Sahyadri), and Deccan plateau. The state has a tropical monsoon climate and receives

rainfall from the south-west monsoonal winds (June–September). Rainfall varies according to physiographic divisions, and it is unevenly distributed in many areas.Secondary data were used to conduct the rainfall and reservoir water storage assessment research. The rainfall and reservoir water storage statistics given by the Maharashtra Government's Water Resources Department (Jalsampada Vibhag) were used in this study. The graphical depiction of dam water availability by division in different months. The data on agricultural output of various crops during the Kharif and Rabi seasons is collected from the Economic Survey of Maharashtra, which is produced by the Department of Economics and Statistics, Planning Department, Government of Maharashtra. The Kokan area has considerable rainfall (>2000 mm), whereas the Deccan Plateau and Western Ghats have medium rainfall (Avg. 600-1000 mm). The temperature ranges from 12 to 450 degrees Celsius in the winter and summer seasons, respectively. The regions of Vidarbha, Marathwada, and Khandesh are experiencing intense heat. The state's significant agricultural region is watered by large rivers like as the Godavari, Krishna, Koyana, Tapi, Narmada, Bhima, Wardha, and Wainganga. The geological formations of the Peninsular shield that are made up of old rocks from the Precambrian, Proterozoic, and Permocarboniferous eras. The Deccan trap covers over 80% of the state and is comprised of Basalt, which has low permeability and porosity, resulting in water shortage and drought-prone conditions in many regions of the state. Only the Vidarbha and Kokan areas have 90 percent of the economic minerals, including as coal, iron, limestone, manganese, bauxite, and so on.

IV. CONCLUSION

All Because of the availability of surface water deployed in dams for household, agricultural, and industrial needs. As the severity of the drought worsens, it has a direct impact on the state's agricultural industry and economy. People from drought-affected areas began migrating to urban regions in other parts of the country in search of work. Drought impairs agricultural productivity, and the balance between supply and demand for agricultural goods is disrupted, leading to higher inflation. The agricultural production of grains, pulses, and cotton in 2015 was cut by half compared to the previous year. The drought had a significant impact on Maharashtra's cotton belt, which saw the greatest number of farmer suicides reported in 2015. Farmers in the Aurangabad division have turned to cash crops such as sugarcane, banana, and turmeric, which demand more water than traditional crops such as cereals and pulses. Agricultural productivity may be boosted by using water-saving practises and smart crop planning. The development of a watershed will enhance the amount of surface and groundwater available. Drought management should be carried out through public engagement and knowledge in order to prepare for potential future droughts. Scientific advancements in breeding more drought-resistant animal and plant kinds will be critical in restoring the ecosystem's equilibrium. Water budgeting at all levels is also critical.

V. REFERENCES

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