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Inter State, Regional and Sub-Regional Disparities in Distribution of Irrigation Facilities in India and Lack of Trustworthy Statistical Resources for Policy Making

Krushna Kulkarni[1], Dr. Samadhan Patil[2]
[1]Research Student and Assistant Professor
[2]Research Guide, Associate Professor and Head,
Department of Economics, Tuljaram Chaturchand College, Baramati
Corresponding Author- Krushna Kulkarni
Email- krushnakulkarni.mh@gmail.com
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Abstract:

India is the seventh-largest country in the world by geographical size, covering an area of approximately 3.29 million square kilometers (1.27 million square miles). India accounts for about 2.4% of the total landmass of the world. With this land it is sustaining 17.7% of the world population. It becomes possible because India possesses a significant amount of Arable Land. Arable land refers to land suitable for agriculture, including the cultivation of crops. India ranks among the top countries with the largest arable land area. India's ample arable land contributes to its agricultural productivity and supports a diverse range of crops, including grains, pulses, oilseeds, fruits, vegetables, and cash crops. The agricultural sector plays a crucial role in the Indian economy, employing a significant portion of the population and contributing to food security and rural livelihoods. But in spite of hosting the largest chunk of arable land in the world its ranking in agriculture crop productivity, water use efficiency and on many other parameters is not so noteworthy. Moreover being a continental country, the disparities in various indicators across states, regions and sub-regions are huge. This article tries to reviw the Inter-state, Regional and Sub-Regional Disparities in Distribution of Irrigation Facilities in India.

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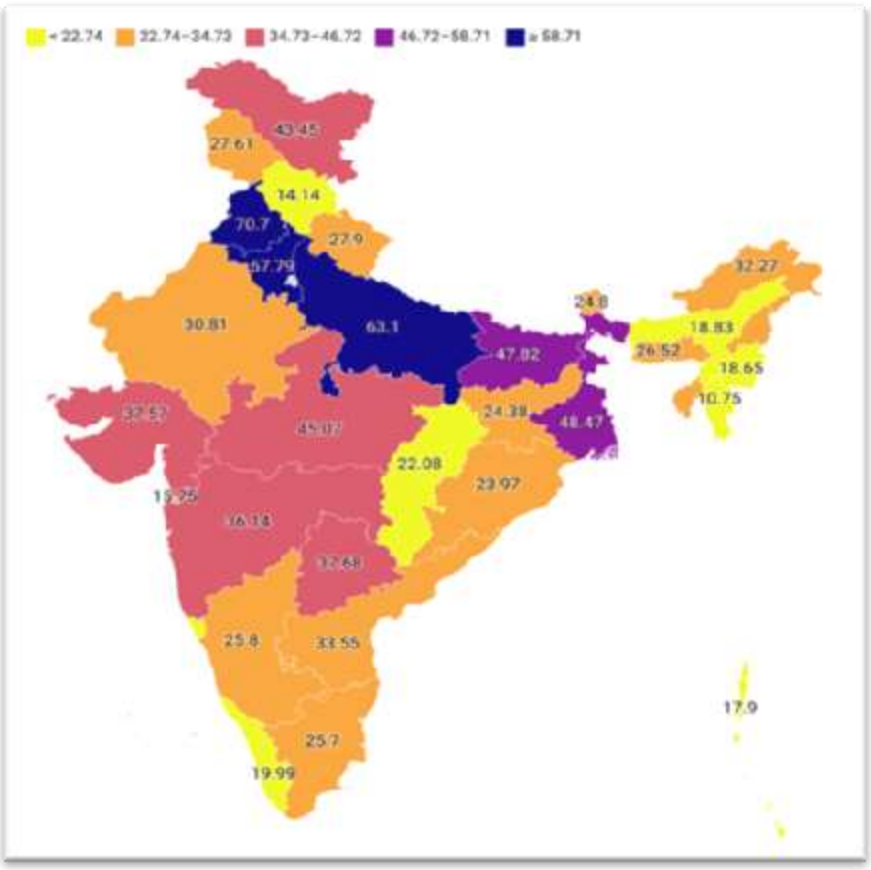
Inter State Disparities

It continental size, huge climatic diversity, historical legacy creates a number of disparities across all the walks of human life. Following is the analysis of the

% Irrigated Land/ Total Cultivable Land



Source: Ministry of Rural Development Map Created by: Krushna Kulkarni

After analyzing the data, we observe significant variations in irrigated land percentage across different regions. Punjab stands out with the highest percentage of irrigated land at 70.70%. Known as the "Granary of India," Punjab's fertile soil and well-developed irrigation infrastructure make it a key agricultural state. It specializes in the cultivation of wheat, rice, and other crops. Haryana closely follows Punjab with a substantial percentage of arable land at 67.79%. Similar to Punjab, Haryana is an agriculturally rich state, cultivating crops like wheat, rice, sugarcane, and vegetables. Other states with noteworthy irrigation land percentages include Uttar Pradesh (63.10%), Bihar (47.82%), West Bengal (48.47%), and Madhya Pradesh (45.07%). These states have extensive agricultural activities and contribute significantly to India's food production. On the other hand, certain regions have comparatively lower irrigation land percentages. Mizoram (10.75%), Himachal Pradesh (14.14%), and Dadra and Nagar Haveli and Daman and Diu (15.75%) have relatively smaller proportions of irrigation land. These areas may have geographical constraints or focus on other economic activities beyond agriculture. It is interesting to note that Ladakh (43.45%), an arid and mountainous region, has a relatively higher irrigation land percentage compared to some other states. This could be due to specific pockets of cultivable land within the region. Overall, the data highlights the diversity in the distribution of irrigation land across different states and union territories in India. Factors such as soil fertility, irrigation infrastructure, geographical features, and economic priorities contribute to the variations in irrigation land percentages. Understanding these variations is crucial for agricultural planning, resource allocation, and sustainable development in the respective regions.

Some of the key factors contributing to these disparities include geographical variations in rainfall, river drainage system, historical development patterns, water availability, and infrastructure development. Here are some examples of regional disparities in the distribution of irrigation facilities in India:

1. North vs. South: Northern states like Punjab, Haryana, and Uttar Pradesh have traditionally had better access to irrigation facilities compared to southern states like Tamil Nadu, Andhra Pradesh, and Telangana. The northern states benefit from the extensive canal networks of the Indus and Ganges river systems, while southern states rely more on tank irrigation, wells, and smaller-scale irrigation projects.
2. East vs. West: There are disparities between eastern and western regions of India as well. The western states such as Gujarat, Maharashtra, and Rajasthan have made significant investments in large-scale irrigation projects like dams, canals, and lift irrigation systems. In contrast, the eastern states like Bihar, Jharkhand, and Odisha have limited irrigation infrastructure, with many areas still dependent on rainfall for agriculture.
3. Inter-State Disparities: Within each region, there can be significant disparities between states. For example, in Maharashtra, regions like Vidarbha and Marathwada face water scarcity and limited irrigation facilities, while the western parts of the state, such as the Godavari and Krishna river basins, have better-developed irrigation systems.
4. Coastal Areas: Coastal regions in India often face challenges in irrigation due to the presence of saline water. The high salt content makes irrigation water unsuitable for crop cultivation, impacting the availability and effectiveness of irrigation facilities. States like Gujarat, Tamil Nadu, and Andhra Pradesh have implemented specific measures to address this issue, such as desalination plants and coastal regulation zones.
5. Hill and Mountainous Regions: The hilly and mountainous regions of India, such as the Himalayan states of Uttarakhand and Himachal Pradesh, face unique challenges in irrigation. Steep terrain, rocky landscapes, and limited water sources make the development of irrigation infrastructure more challenging, resulting in disparities in access to irrigation facilities.

Importance of Irrigation Facilities

Irrigation facilities play a crucial role in the agricultural sector and the overall development of India. Here are some key reasons highlighting the importance of irrigation facilities in India:

1. Increased Agricultural Productivity: Irrigation provides a reliable and controlled water supply to crops, reducing dependence on rainfall. This allows farmers to cultivate their fields throughout the year and achieve higher crop yields. Irrigation helps in the production of multiple crop cycles, leading to increased agricultural productivity and food security.

2. Diversification of Crops: Irrigation enables farmers to grow a wider variety of crops, including high-value cash crops, fruits, vegetables, and horticultural crops. With reliable access to water, farmers can cultivate crops that are suited to their local agro-climatic conditions, leading to diversification and better market opportunities.

3. Mitigation of Drought and Famine: India is prone to erratic monsoon patterns and periodic droughts. Irrigation infrastructure provides a buffer against these climatic uncertainties by ensuring water availability during dry spells. By reducing the vulnerability to droughts, irrigation facilities help in mitigating the impact of crop failures, preventing famine situations, and maintaining agricultural stability.

4. Employment Generation: The availability of irrigation facilities creates employment opportunities in the agricultural sector. Irrigation projects require construction, maintenance, and management, which generate jobs for both skilled and unskilled workers. Additionally, improved agricultural productivity resulting from irrigation can lead to downstream employment in food processing, marketing, and related industries.

5. Poverty Alleviation and Rural Development: Irrigation contributes to rural development by increasing farm incomes and reducing poverty. When farmers have access to reliable irrigation, they can improve their livelihoods, invest in farm modernization, and enhance agricultural profitability. This, in turn, stimulates economic growth, improves living standards, and helps in reducing rural-urban migration.

6. Water Resource Management: Irrigation facilities promote efficient water use and conservation. Through techniques such as

drip irrigation and sprinkler irrigation, farmers can optimize water application, reduce water wastage, and minimize the strain on water resources. Effective water management practices help in sustaining agriculture while ensuring the long-term availability of water for other sectors.

It's important to note that the successful implementation and management of irrigation facilities require proper planning, infrastructure development, equitable access, and sustainable water resource management practices.

Neglect of Statistics in addressing the distribution of Irrigation Facilities and Policy Making

Efforts are being made by the Indian government and state authorities to bridge these regional disparities in irrigation facilities. This includes the implementation of large-scale irrigation projects, promotion of micro-irrigation techniques, watershed management programs, and the expansion of rural infrastructure. However, addressing historical disparities and ensuring equitable distribution of irrigation facilities remains an ongoing challenge. One of the main reasons why India as a country has failed to address the "Irrigation Challlenge" is the lack of creditworthy statistics to prove the extent of irrigation in a given year and actual improvement in irrigation.

The neglect of statistics in the distribution of irrigation facilities in India has been a concern and a contributing factor to the regional disparities. The non-availability of the creditworthy data also arises from the fact that many of the Central Sector Schemes or Central Sponsored Schemes are funded by the Central Government but they are implemented by the State Governments. But the updated data required for planning is not collected and data abruptly reported by the ground level which is collected by village level state government functionary like Talathi/Patwari and Gram Sevak is used for planning and analysis.

Here are some key points highlighting this issue:

1. Lack of Data Accuracy: Accurate and up-to-date statistics are essential for effective planning, resource allocation, and policy formulation. However, there have been instances of inadequate data collection and reporting regarding irrigation facilities in various parts of India. Incomplete or unreliable data hinder the understanding of the actual distribution of irrigation facilities and the identification of areas that require attention.
2. Inadequate Monitoring and Evaluation: Proper monitoring and evaluation of irrigation projects are necessary to assess their effectiveness and identify areas where improvements are needed. However, the lack of robust monitoring mechanisms and comprehensive evaluation studies hampers the understanding of the impact and efficiency of irrigation facilities. This further perpetuates the neglect of statistics in decision-making processes.
3. Limited Transparency: Transparency in the distribution of irrigation facilities is crucial for ensuring fairness and equity. However, the lack of transparency in the allocation of resources and the decision-making processes can lead to biases, favoritism, and uneven distribution of irrigation facilities. This lack of transparency makes it difficult to track and address disparities effectively.
4. Data Accessibility and Utilization: Even when data is available, its accessibility and utilization are often limited. There is a need for making irrigation-related statistics more readily accessible to policymakers, researchers, and the general public. Improved data utilization can facilitate evidence-based decision-making, targeted interventions, and more informed policy discussions.
5. Integration of Technology and Data Analytics: The integration of technology, such as remote sensing, geographic information systems (GIS), and data analytics, can greatly enhance the collection, analysis, and visualization of irrigation-related statistics. By leveraging these tools, it becomes easier to identify areas with inadequate irrigation facilities, monitor water usage, and prioritize interventions accordingly.

As a result of poor data collection, the further analysis of the distribution of irrigation facilities to explain the regional and sub regional disparities got difficult because the data collected from the various sources showed the Marathwada, Amaravati Region Similarly, taking the case of Satara District it showed that the Man and Khatav Tehsils to have better irrigation facilities

than other tehsils in Satara Districts which is contrary to facts.

Suggestions

Addressing the neglect of statistics in the distribution of irrigation facilities requires a multi-faceted approach. It involves strengthening data collection systems, improving monitoring and evaluation processes, promoting transparency, and fostering a culture of Data-Driven Decision-Making. By prioritizing the collection, analysis, and utilization of accurate statistics, policymakers can make informed decisions to bridge the regional disparities in irrigation facilities and ensure equitable distribution of resources. This is a dire requirement of the hour. Especially, during the times in which collecting and analyzing data has become quite easy, government needs to act fast. The programmes which are based on objective tools like PMGSY have produced tremendous results. Use of objective data like Adhar Card has ensured that huge leakages in distribution of benefits of PDS could be saved, Direct Benefit Transfers have ensured that millions of farmers, students could get their due without any slippage. Now is the time we start collecting seamless, authenticated data for better targeting of public resources in irrigation.

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