



ASSESSMENT OF RURAL WATER SUPPLY AND JAL JEEVAN MISSION PERFORMANCE IN ODISHA

Subhasmita Parida

RESEARCH ARTICLE



Author Details:

Assistant Professor of Economics,
USBM & Research Scholar,
KIIT University, Bhubaneswar,
Odisha, India

Corresponding Author:

Subhasmita Parida

DOI:

<https://doi.org/10.70096/tssr.250303028>

Abstract

The Jal Jeevan Mission (JJM), launched by the Government of India in 2019, aims to provide safe and adequate drinking water through Functional Household Tap Connections (FHTCs) to every rural household by 2024. Odisha, with its diverse topography, tribal populations, and scattered rural settlements, presents unique challenges and opportunities for the implementation of this mission. This study provides a status analysis of the Jal Jeevan Mission in Odisha, focusing on its targeted approach to addressing rural water supply disparities. By examining district-level progress, policy interventions, and implementation strategies, the study evaluates the effectiveness of the mission in reaching marginalized and water-stressed communities. It highlights the role of Village Water and Sanitation Committees (VWSCs), convergence with other development schemes, and the use of technology in ensuring sustainability and community ownership. The analysis identifies key challenges such as geographical barriers, infrastructure gaps, and operation & maintenance issues. Based on findings, the paper offers strategic recommendations to enhance the efficiency, equity, and long-term sustainability of rural drinking water supply services in Odisha. The study underscores the critical need for inclusive, decentralized, and context-specific approaches to ensure water security for all.

Keywords: Allocation, drinking water, Jal Jeevan Mission, Rural area, Tap connection

Introduction

Jal Jeevan Mission (JJM) has come up with the target to provide functional water tap connection to every household in India by 2024. As a political priority, this programme was launched in the year 2019. It has also set the target to address the water related challenges in quality affected areas. The time bound agenda of this programme once again motivates scholars to examine how far the desired objective has been achieved. This study also aims to enquire the above objective in case of water quality affected areas in Odisha. Before proceeding towards the said enquiry, let's have an understanding of drinking water quality concern as a focus under previous programmes and policies of the government of India. Finally, attention would be given towards the performance of state governments and the necessity of first-hand empirical documentation about the piped water connection in quality affected areas. There has been a longstanding enquiry among scholars why India has focused largely on social protection measures to fulfil the agenda of welfare in comparison to the provisioning of public goods (Kapur and Nangia, 2015). In this direction provides the explanation that India had opted coping mechanism to be easier and immediate in comparison to preventive and mitigation measure. As the purpose of a welfare state should not but at the same time, one cannot also not ignore the complexities associated with meeting the requirement to provision for basic public goods like health, education, water, sanitation, electricity, roads, housing, etc. Most of these services not only require huge capital investments but also involves cost towards maintenance and staffing. Notwithstanding the above, the demand to meet the requirements of Sustainable Development Goals has brought a gradual attention shift among governments to fulfil and provision for substantive public goods through targeted approach in a time bound manner. This trend has also found to be manifested in case of provision of drinking water supply services both in rural and urban localities. Among the above services, water and sanitation has got utmost attention in recent times. Considering the above trend, this paper aims to examine the status of drinking water supply in rural areas of Odisha. The above purpose of this paper has been addressed over here with the central concern that how far setting targets ensures compliance of service delivery. reply of certain basic services which are considered to be critical to achieve sustainable development goals. Despite the above concern Provisioning of basic public services considered as significant indicator towards the human development. The recent experience of Covid-19 pandemic brought the realisation that there is necessity to provision and deliver those services which are critical to both Sustainable Development Goals and Human Development Indicators as well. In this regard, the basic services like health, education, water supply, sanitation facilities, electricity, etc found to be prominent. In this

context, this paper aims to examine how setting targets matters to supply of piped water facility to rural areas of Odisha. India's journey as one of the countries to achieve this goal has started much before to it. However, Jal Jeevan Mission as a policy focus has provided a target driven approach to ensure functional water tap connection to both the household and institutions by 2024.

Review of Literature

Literatures is scanty on Jal Jeevan Mission due to implementation in 2019 only. Mudgerikar and Cronin, 2012 observed that disparity also continues to persist spatially like rural and urban. that who is gaining access to this facility. Cronin et.al (2012) has shown the contrasting observation on it. They highlighted the concern that the contribution of India though appreciated by the global MDG for drinking water but how far it is about improved drinking water quality needs to be assessed. Access to improved water source is essentially not implies that the concerned population has access to quality drinking water. They pointed about the contamination due to geogenic pollution could pose serious health problems, especially for the marginalized population. This observation has also attracted our attention towards how water quality matters in health care.

Sobsey and Bartram S (2003) offers the argument that it will be important to acknowledge that safe water is one of essential components or needs for healthy living, along with adequate sanitation and proper nutrition. Together, these are the essential health needs to be met in the developing and the developed world. All three contribute to reduced disease and increased health, and the lack of one can degrade the beneficial impact of the others. Many works have made their contribution to the above idea. (Brainerd and Menon: 2004; Fewtrell and Bartram: 2001, Tebbutt: 1983).

Zhang (2012) provides the argument that water quality has an impact on health of the concerned population. State initiative towards investment on drinking water infrastructure could result into decrease of diseases. This argument has been supported with an empirical study from water quality improvement program in rural China on the health of adults and children.

Srikant (2009) provides the analysis how strategies in data management programme at village, district and national level, up-gradation of district-level laboratories and addressing technical, legal and institutional components should become the first steps in achieving effective water-quality management and providing better health to millions of people living in rural India.

Objective of the Study

1. To investigate the progress of rural drinking water supply under Jal Jeevan Mission in Odisha.

Drinking Water Quality and Past Initiatives in India

Drinking water supply has been a priority since India's independence. Indian Constitution has recognised this necessity through article 47 which mandate the state governments towards the supply of clean drinking water. Under Indian federal arrangement, this responsibility is listed in Entry 17 of state list. Moreover, scope of this Entry is subject to the provision of Entry 56 of Union list. Such provision also empowers central government to extend policy and programmatic support for the availability water supply. One could trace the initiative of Indian government in the initial years of independence when the Environmental Hygiene committee (1949) was constituted. It recommended that there must have a programme of provision of safe water supply to all villages in India. It had also highlighted the importance of piped water connection in supplying safe drinking water. Piped water connection is acknowledged as one of the improved mediums to ensure water supply to the concerned household. It is a part of the infrastructure of drinking water supply network. It is installed to carry water from the source to the individual or customer. As per the recommendation of this committee, the design of Piped water must be done to keep in view the supply of adequate quantities of water. This committee has also underlined the purpose for which pipe water can be used. One among them is for domestic purposes which includes cooking, drinking, bathing washing and flushing of closets. It also needs to be designed for public purposes like, street washing, flushing of sewers, watering of public parks and supplying to certain public buildings. However, urban areas have got more focus on such type of water supply in comparison to rural localities. It was so due to three factors. They are economic efficiency, technology and demand. All these factors are usually found to be prevailed in urban than the rural localities. Notwithstanding the above, the recommendation of the said committee got priority in the first five-year plan (1951-56). As a result, to this planned intervention, National Water supply programme was launched in the year of 1954 under the head of health sector. Until the third five-year plan (1961-66) drinking water supply in the rural areas was a subject of the community development Programme.

The quality concern in drinking water evolves with the commencement of National Water Policy, 1987. In fact, mission approach to ensure drinking water supply and also quality got major attention through National Drinking Water Mission. Along with the above another intervention has come up in the name of Technology Mission which was introduced during 1986-87. In the year 1991, this mission was renamed as Rajiv Gandhi National Drinking Water Mission (RGNDWM). It was the Eighth Five Year Plan (1992-1997) which has systematically generated attention towards those localities who suffers from quality issues in ground water. These localities are designated as *quality affected habitations*. Generally, these areas suffer from high concentration of Fluoride, Arsenic, Iron, Salinity and presence of heavy metals, etc. Water Supply Programme (ARWSP), however, categorizes water as safe "if it is free from bacteriological contamination (cholera, typhoid, etc.) and chemical contamination (excess arsenic, fluoride, salinity, iron, nitrates, etc.)". But it does not force the government to adhere to a minimum quality benchmark (Pati : 2010, p14). The concern associated with such areas have supported through the Technology Mission which was introduced

during 1986-87. This scheme was further renamed as Rajiv Gandhi National Drinking Water Mission in 1992. As a consequence, to this mission, focus on water quality and role of technological intervention towards it has gained attention.

Further, the Eleventh Plan period (2007-12) has also identified poor water quality as a major concern in rural areas. Such identification had led to the inclusion of these habitations under the National Rural Drinking Water Programme which was launched in the year 2009. This programme has also aimed to provision for pipe water supply system in a more systematic manner in comparison to the previous initiatives. There was conscious initiative to develop alternative sources through rain water harvesting as treatment facility for arsenic and fluoride contamination affected areas. Besides the above, a major shift has also noticed with regard to approaches of delivery of water supply. In earlier initiative top-down and technology driven approach has given priority. After the revision of Water Policy in 2002 the decentralized driven approach has gained attention. This has led to focus on issues of equity, sustainability and community participation. It came up with the understanding that the demand for drinking water could be the way out for sustaining the system at the grass root level. This revised policy has also added introduction of phased programme to address quality concern in water and monitoring of surface and ground water should be regularly conducted. All these trends in drinking water supply provision have been referred as generation of programmes (Sridhar: 2012). Such shift has also attracted our attention towards quality affected areas where sustainable and equitable access to piped drinking water continues to be major challenge in comparison to other localities. Moreover, objectives of National Rural Water Drinking Programme were intended to achieve by 2030 to keep in view the timeline of sustainable development goals. Under this programme, flexibility has been given to the States/UTs for inclusion of decentralized principles in order make the programme demand driven and also encouraged to take area specific strategy for the sustainability of the source, system, finance and management of the drinking water supply infrastructure. Subsequently, National Rural Drinking Water Quality Monitoring and Surveillance Programme, 2006 was launched to monitor drinking water sources. In this process, community has been given priority towards the surveillance of drinking water source. In fact, attention towards Arsenic and Fluoride affected habitations got prominent focus when National Water Quality Sub Mission was introduced in 2017 to provide safe drinking water to all these habitations by 2021.

Implementation of Jal Jeevan Mission (JJM) in India

On 15th August 2019, JJM was declared with an objective to provide functional water tap connection to every household in India by 2024. Since 1951 to 2019 most of the efforts were focused on providing safe drinking water supply to rural population either through hand pumps, protected wells or piped water supply with public stand posts as delivery point. Under NRDWP, one of the objectives was to “enable all households to have access to and use safe & adequate drinking water within premises to the extent possible”. It was proposed to achieve the goal by 2030, coinciding with the United Nation’s Sustainable Development Goals. But now, it is planned to achieve the goal by 2024 through JJM. Such initiative sets a target driven approach to ensure functional water tap connection to all the households and institutions by 2024. Since the beginning of planned period, supply of safe drinking water has always been considered as a priority in recommendations of various committees and also a thrust area of different programmes. Notwithstanding the above, access to safe drinking water especially quality affected areas continues as a major concern. In this context, programme like Jal Jeevan Mission offers the scope to assess how far a target driven approach could ensure a challenging task like contamination free drinking water in quality affected areas.

This mission has seven objectives and eight components. These seven objectives also include quality affected areas as a priority to provision functional water tap connection as a service to deliver at the household level. In order to supply water with adequate quantity and also of prescribed quality, both technology and community driven approaches have taken to together. This could be achieved through three strategies. First, Application of appropriate treatment technology needs to be applied in case of those villages where availability of ground water is not a problem. Secondly, provision of bulk transfer of water from long distance will be ensured if there is lack of water availability. Thirdly, system of community water purification plants will be installed as an interim measure for Arsenic and Fluoride contamination areas. Fourth, monitoring of water quality will be conducted through the laboratory test by the concerned department. The surveillance of water quality will be conducted by local community through Field Test Kits (FTKs).

Another significant aspect of this programme is also to have a comprehensive database or information system on water *quality affected areas*. This is to be maintained through the Integrated Management Information System (IMIS). It is reported in the JJM portal that there is total 26,007 number of habitations affected with water quality issues. These habitations are identified with six types of contaminations. They are Arsenic, Iron, Fluoride, Salinity, Nitrate and Heavy metals. The number of iron contaminated habitations is found to be more in comparison to others. The detail status of the nature of habitation along with their habitation status is presented in the following table.

Table. 1: Status of Quality Affected Habitation in India, 2024

Sl. No.	Nature of Contamination	Total number of Habitations	% of total habitations	Rank of Contamination
1.	Arsenic	795	3.06	3
2.	Fluoride	669	2.57	4
3.	Iron	13, 989	53.79	1
4.	Salinity	9,929	38.18	2

5.	Nitrate	517	1.99	5
6.	Heavy Metals	108	0.42	6
	Total	26007	100	--

Source: JJM Portal & Column, 3 & 4 are authors calculation

Table-1 implies that there are six types of contaminations like arsenic, fluoride, Iron, Salinity, Nitrate & Heavy Metals, from these Iron found to has contaminated maximum numbers of habitat in India as compared to other contaminated areas. It also shows that the Iron has the 1st rank in contamination with 53.7% followed by salinity and heavy metals has the lowest rank.

Water Quality Affected Areas of Odisha

Odisha is located in the eastern part of India. The coastline of it is about 450 kilometers. The state has an updated water planning document which forecasts about its availability till 2051 from various sources. In this initiative the department of Water Resources has taken systematic steps in framing policies in Odisha. In fact, studies are there which informs that how Odisha is continuing with various water quality problems. There are also studies available on how coverage of piped water connection has been done under Rajiv Gandhi National Drinking Water Programme (All India Institute of Hygiene and Public Health: 1998). However, to what extent targeted intervention with a mission mode approach matters in supplying piped water connection to quality affected areas has not yet adequately addressed. Such enquiry needs to be conducted through service delivery perspective where one could assess how far time bound approach ensures utility services like piped drinking water facility in quality affected areas. In this context, Odisha would be an appropriate locality to examine the above concern. There are also two more rationales for choosing Odisha. First, this state has its own independent water policy which come up in line with national water policy. One came in the year 2002 and another came up in the year 2007. All these policies have given top priority to issues of quality in drinking water supply. Further, in the year 2018 Odisha has also come up with new drinking water supply scheme with exclusively state funding support named as Buxi Jagabandhu Assured Water Supply to Habitations (BASUDHA). Despite the above developments, Odisha was just at the level of 0 to 10 percent slab with regard to water tap connection to individual households (JJM, 2019). This is also one of the states among ten who comes under the last category with regard to piped water connection. Now, report indicates that tap water connection has significantly increased in Odisha and a more than 45% household has been covered (JJM, 2022). Such development also generates the impression that target setting matters to service delivery and drinking water supply services also includes in it. Secondly, many of the independent research reports have also pointed out about the poor services with regard to supply of quality drinking water in most of the quality affected areas. And Odisha is also affected with quality issues in drinking water. As per the existing database is concerned, Odisha is having second highest quality affected habitations in India after Rajasthan (IMIS).

Statistical Profile of Quality Affected Areas of Odisha

There are many data found to persist about the water quality affected localities of Odisha. For this research project, identification of such areas has finalized after consulting three prominent databases. One of them has been obtained from the data of ground water contamination provided by Central Ground Water Board (CGWB). This information source not only provides district wise details about the contamination of ground water but also have maps of various inorganic chemicals, particles and electrolyte substances. Broadly, they are identified as arsenic, salinity, fluoride, iron, nitrate, chloride. This database informs that quality problems generally persist in drinking water due to the dominance of above six substances. On the other hand, the second data source is IMIS which is maintained under the Department of Drinking Water and Sanitation, Ministry of Jal Shakti. However, under JJM priority has given to the database developed under IMIS which has been compiled on the basis of identifying the contamination from where the supply of water source is sourced. In fact, this strategy of identification of quality affected areas has led to the reduction of projected districts identified under CGWB. Besides the above, priority has emphasized for regular testing to set particular parameters on water quality of those localities. Accordingly, state governments have also directed to provide their latest testing report on water level contamination to label the locality as quality affected habitation. Odisha was also one among those states. There are two different ways through which one could map the status of water quality affected areas. One of the ways emanates from the report of governments where the term habitation is used to identify an area as water quality affected. As per the implementation of Jal Jeevan Mission is concerned, both central and state governments are reconciling each other on how many habitations are actually indicates water quality concerns. It includes total number of households, population and also the progress status of government intervention.

Status of Piped Water Connection in Quality Affected Habitations

As per the Annual Action Plan (AAP), 2020-21 submitted by Odisha government to the Department of Drinking Water and Sanitation, Ministry of Jal Shakti, the state has total 16,503 quality affected habitations. Out of them, the state has proposed plans for the 12,985 habitations. However, IMIS database reports about 3,518 quality affected areas in the state since the beginning of implementation of Jal Jeevan Mission programme. Taking into account the above difference, this study has used IMIS database as suggested by most of the officials who are associated with the implementation process of JJM in the state. Since 2020, Odisha has been reported decreasing number of quality affected habitations. However, initiatives relating to necessary measures for quality issues in water in the affected districts have not been reported in a transparent manner. If one considers the status of quality affected habitations since the implementation of JJM, the localities which were identified in the year 2020 is not found in the list of subsequent years. Such information is also not reported in the IMIS portal. Like, in the year 2020-2021 in format-

J5, Odisha had reported 3467 QAHs in 25 districts. This information also includes habitations of Kendrapada district. However, subsequent lists along with the map of quality affected habitation all these habitations of the concerned district are not found to be visible. The remedial measure to water quality problems in those localities has also not been exhibited in the online portal. Secondly, another discrepancy also noted among consecutive J5 format. There are 146 habitations having 100% coverage. However, sample selection of habitations and calculation of households has been done to keep in view the format of March of each financial year from 2021 to 2023. On the basis of such information, status of quality affected habitations in Odisha has been compiled. It is identified that around 0.16 percent households of rural Odisha are located in the quality affected habitations which is very minimal in comparison to the localities having normal access to quality drinking water. This implies that the population habited in those localities are in a condition of geographical marginality in comparison to others. In this context, the promises offered under *har ghar jal* definitely bears the prospect of inclusion. How far such prospect translates into reality needs to be verified and examined. This indicates that around 21 percent coverage has been done towards the piped drinking water connection in QAHs of Odisha. The details are as follows. As the research focus of this project is to assess the pipe water supply of drinking water facility in those localities, it is considered to take the data provided by IMIS, DDWS as per the guidelines of JJM.

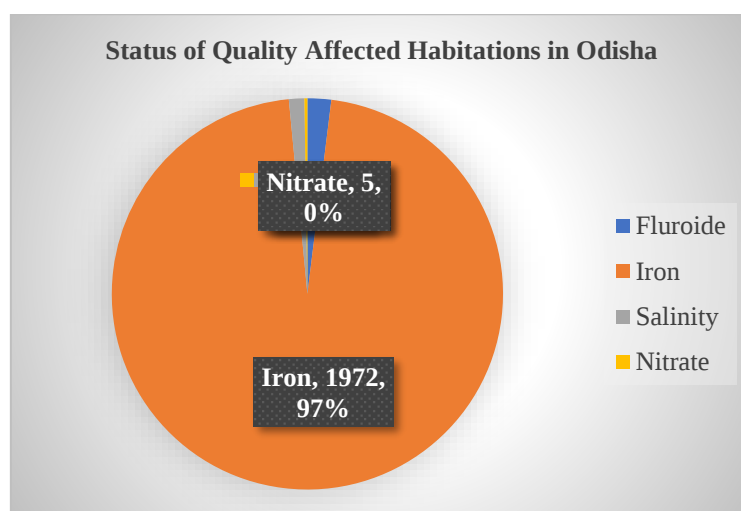
Table. 2: Status of Piped Water connection to Quality Affected Habitations of Odisha

Year	Number of QAHs	Total number of Districts	No. of piped water connected Habitations (100%)	No. of Households connected with piped water	Households	% of Households with Piped Water
2020-21	3467	25	77 (2.22)	2819	61,459	4.59
2021-22	2111	23	146 (6.91)	5206	30,598	17.01
2022-23	2045	20	348 (17)	748	30,982	16.80
Total	7623	---	571(26.13)	8773	1,23,039	38.40

Source: Compiled out of Format J5 [JJM Reports \(ejalshakti.gov.in\)](http://ejalshakti.gov.in) & column 7 is Authors calculation

Table-2 implies that 38.4% households are provided piped water supply in quality affected habitats in Odisha. so this indicate a implementation of Jal Jeevan mission in state of Odisha is not yet satisfactory. As per the IMIS database, Odisha is dominantly continuing with four kinds of geogenic contamination at the ground water. These substances are Fluoride, Iron, Salinity, and Nitrate. Odisha is essentially not identified as arsenic affected area. As the state has a long coastline, it is natural that saline condition of water continued to prevail in most of the coastal districts. The determination of saline component depends on total concentration of salt level in water. It is considered as a quality issue problem in water which could be located both in the inland and coastal areas. While coming to the Iron contamination, the state is having numerous habitations in comparison to others. The Central Ground Water database also provides a detail mapping of water level contamination. If we consider the 2018 database of CGW, all these four substances (salinity, Fluoride, Nitrate and Iron) dominantly found to be prevailed in 14 districts of Odisha. Among them iron found to be prevailed over 28 districts out of 30. Whereas, three substances like Salinity, Fluoride, Nitrate found to be around 12 districts. This database also shares similarity with the IMIS database on quality affected habitations in Odisha. This data provides the status of contamination on the basis of district and state where water quality hotspots are identified through unconfined aquifers of India. Such identification has been done for major physio-chemical pollutants. The dominant among them are Arsenic, Fluoride, Salinity, Iron, Chloride and Nitrate.

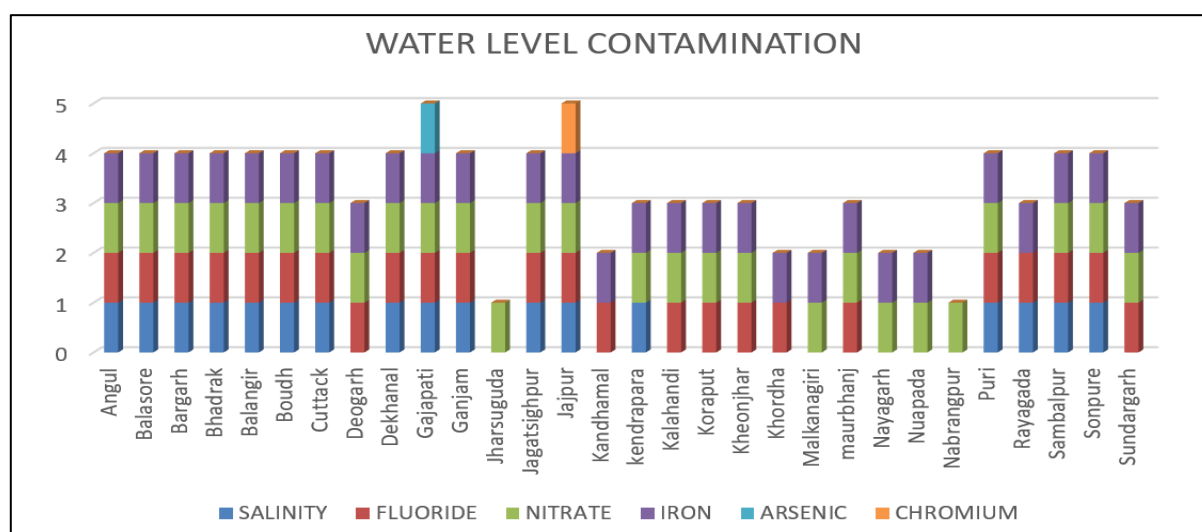
Figure. 1: Status of Quality Affected Habitations in Odisha



The other database is developed by IMIS which is maintained by Department of Drinking Water and Sanitation monitors drinking water sources having water quality issues mainly chemical contaminants such as Arsenic, Fluoride, Iron, Nitrate, Salinity and heavy metals as reported by states. The data provided by CGWB indicates the overall ground water quality of the concerned locality. On the other hand, IMIS, DDWS data indicate the area wherein drinking water sources having quality issues. Moreover, comprehensive understanding of water level contamination is found to be more visible in the database of CGWB. Whereas, JJM has given priority to the database developed under IMIS which has been compiled on the basis of identifying the contamination from where the supply of water source is sourced. In fact, this focus has led to the reduction of projected districts having contaminated habitations where particular parameter of water needs to be identified through testing. Accordingly, most of the state government have directed to provide their latest testing report on water level contamination. Odisha was also one among those states.

It is indicated in figure-2 that how one particular district is affected with multiple level of contaminations. Whereas, some of the districts have not contain multiple level of contamination but have highest concentration of quality affected habitations. In such cases one particular form of contamination found to be prevailed in the entire district. If one takes into account the status report of previous three years as mentioned in the Table-2, it indicates that the number of QAHs has reduced.

Figure: 2: District wise status of Water level contamination in Odisha



Source: Author's compilation

This informs that coverage of the programme in these localities has been expanded. On the basis of this information, impression may generate that time bound programme or mission approach to the challenging task like water supply service through piped connection could be reality in those localities. With the above assumption, field visit has been determined to assess the status of functional tap water connections in certain selected localities. Before finalising the field locations, it is significant to learn about the governance structure of Jal Jeevan Mission in Odisha.

Budgetary Provision and Funding Allocation in Odisha in different Schemes

Odisha government has proposed huge investment of more than Rs.12,000 crore during the year 2021-22 for piped drinking water from budget and off-budget sources. These sources are as follows.

Table. 3: Status of Budgetary Allocation

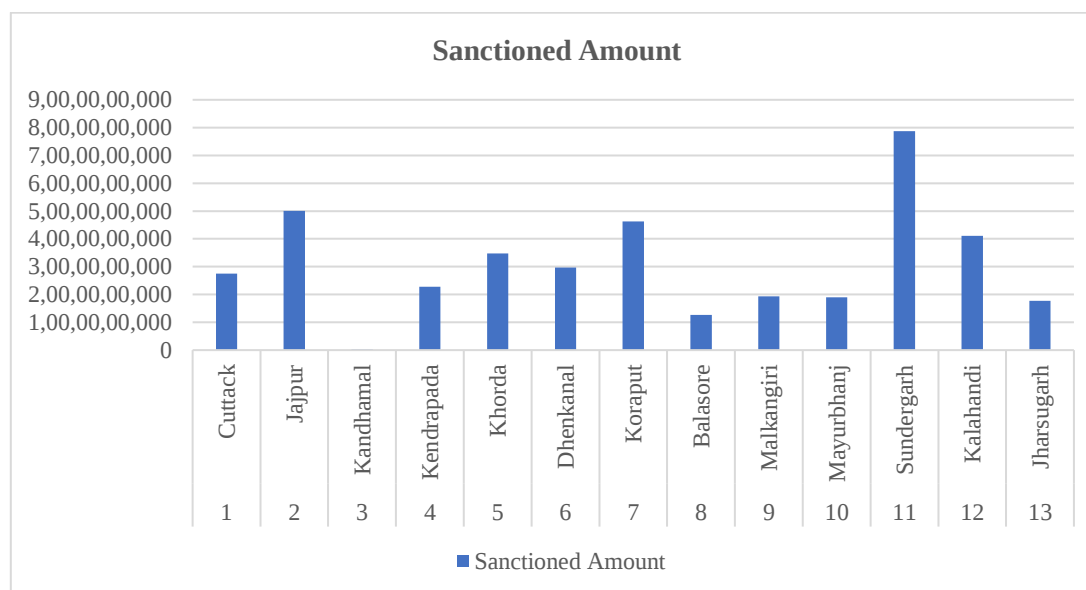
Name of the Scheme/Programme	Funding Allocation Amount (Crores)	% of fund allocation as per scheme
BASUDHA	2,419	20.97
Jal Jeevan Mission	6,300	54.62
OMBADC	2,150	18.64
DMF	665	5.77
total	11,534	100

Source: Annual budget & author compilation

As per table – 3 Government has allocated different amount of funds to different schemes for the purpose of water supply in Odisha, whereas the highest number of funds i.e. 54.62% are allocated to Jal Jeevan mission scheme as compared to schemes

like Basudha (20.97%) and OMBADC (18.64%) and DMF (5.77%). It is suggested that more funds should be allocated to Jal Jeevan mission as well as these schemes.

Figure. 3: District wise sanctioned amount out of JJM Fund in 13 districts



In this study, the determination of locality has been selected with the purpose to understand/observe the real situations and the factors which are responsible for such situation. Therefore, the method of data collection employs case study, observation and interview methods to assess the coverage of piped water connection to each household and functionality of Water and Sanitation committee in the concerned habitation.

Conclusion

This study raised the concern how far mission approach provision of drinking water supply to quality affected habitation is working to achieve its desired objectives. In exploring the above concern, the study has also come across reason of programme implementation challenges regarding the provision of piped water supply for drinking facility as a public good to the households. It is learned that adopting mission approach is not new to implementation of programmes on supply of drinking water services. a policy could be assessed through its targets. Now supply of safe drinking water has been accepted as one of the major goals for both national and international actors. On the one hand, this focus generates the impression about the prominence of substantive policy in government's agenda and Jal Jeevan Mission also aims to address it. Odisha is still continued to struggle with lagging behind in terms of 100 percent coverage to Functional Water Tap Connections to quality affected habitations (as per the revised list 2022). It is observed that Odisha is having 0.16 percent of households are coming under the quality affected areas. The mission has incorporated behavioral change strategies to encourage the community's active participation in water conservation and management. While the mission has made significant strides, challenges such as the non-functionality of installed taps and the need for regular maintenance persist. There is need to accelerate pipeline and tap installation in remote and tribal areas through targeted micro-projects. There is urgent need to ensure water quality through regular testing for contaminants like fluoride, iron, and arsenic, especially in western Odisha. it is suggested to promote solar-powered water pumping systems in off-grid villages to ensure sustainability.

Acknowledgment: No

Author's Contribution: Subhasmita Parida: Data Collection, Literature Review, Methodology, Analysis, Drafting, Referencing

Funding: No

Declaration: Not Applicable

Competing Interest: No

References

1. Asian Development Bank (2023). India: Input-Output Economic Indicators. Asian Development Bank. Available at: <https://data.adb.org/dataset/india-input-output-economic-indicators>.
2. Asit, K. B., Ramani, J. & Cecilia, T. (2005). Social perceptions of the impacts of Colombo water supply projects. AMBIO: A Journal of the Human Environment, 34, 639–644.

3. Ball, C. M. (1965). Employment effects of construction expenditures. *Monthly Labor Review*, 88(2), 154–158.
4. Bennett, D. L. (2019). Infrastructure investments and entrepreneurial dynamism in the US. *Journal of Business Venturing* 34,105907.
5. Bongirwar, P. & Dahasahasra, S. (2022). Innovative arch type bridge cum bandhara for economical and quick implementation of Jal Jeevan mission. In *Recent Trends in Construction Technology and Management: Select Proceedings of ACTM 2021*. Springer.
6. CMIE (2024). Unemployment rate rises to 8% in February 2024. *Economic Outlook*, Centre for Monitoring Indian Economy, CMIE.
7. Devoto, F., Duflo, E., Dupas, P., Parienté, W. & Pons, V. (2012). Happiness on tap: Piped water adoption in urban Morocco. *American Economic Journal: Economic Policy*, 4, 68–99.
8. Dwivedi, A. (2017). Infrastructure development and spillovers in the Indian economy. *Business Analyst*, 38, 58–79.
9. EPWRF (2023). *Economic and Political Weekly Research Foundation (EPWRF) – India Time Series*. Available at: <https://epwrfits.in/>.
10. Garrett-Peltier, H. (2017). Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model. *Economic Modelling*, 61, 439–447.
11. Ghosh, M. (2017). Infrastructure and development in rural India. *Margin: The Journal of Applied Economic Research*, 11, 256–289.
12. Government of India (2019) *Operational Guidelines for the implementation of Jal Jeevan Mission: Har Ghar Jal*. Jal Jeevan Mission. Ministry of Jal Shakti, Department of Drinking Water and Sanitation, National Jal Jeevan Mission.

Publisher's Note

The Social Science Review A Multidisciplinary Journal remains neutral with regard to jurisdictional claims in published data, map and institutional affiliations.

©The Author(s) 2025. Open Access.

This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>