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A study on the role of gram panchayats and awareness on Jal Shakti Abhiyan in South Andaman district

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Abstract

This study investigates the water supply, treatment practices, and usage patterns in the Gram Panchayats (GPs), focusing on the role of local governance in managing water resources and the impact of national initiatives such as the Jal Shakti Abhiyan (JSA) in rural areas. The research examines the frequency, duration, and quality of water supply, the modes of payment for water services, and the methods used for water treatment before consumption. Additionally, it explores the main purposes for which water is used, including drinking, cooking, washing, and agriculture. A total of 1300 respondents from various socio-economic backgrounds participated in the study, providing data on key variables such as age, marital status, religion, education, occupation, family type, monthly income, and water-related practices. The findings reveal that a majority of respondents are aware of the JSA, with a significant proportion reporting regular water supply and access to potable water. Despite this, many households still rely on traditional water treatment methods, indicating a need for improved water infrastructure and health-related initiatives. Water is predominantly used for domestic purposes, with cooking being the primary use, followed by washing and drinking. The study highlights regional disparities in water supply frequency and duration, with some households experiencing irregular or inconsistent access. It concludes that while the JSA has raised awareness and improved water access, further attention is needed to enhance water treatment systems, ensure reliable water supply, and address the agricultural water needs of rural communities. This study provides valuable insights for policymakers, aiming to improve water governance and promote sustainable water management in rural India.

Keywords: Water supply, Jal Shakti Abhiyan (JSA), water treatment, gram panchayats, rural water usage

Introduction

In an era where access to clean water and sanitation remains a global challenge, over 2.2 billion people worldwide continue to lack safe drinking water, and almost half the population is deprived of proper sanitation facilities. This critical shortfall exacerbates health disparities, with two billion people unable to access basic handwashing facilities—essential for disease prevention and personal hygiene (UNICEF, 2020) [14]. The persistence of open defecation by 419 million people further highlights the urgent need for transformative approaches to water, sanitation, and hygiene (WASH) services. Acknowledging the risks associated with unsafe drinking water and poor sanitation practices, this article delves into the multifaceted role of WASH in enhancing public health, school attendance, livelihoods, and community resilience (WHO, 2020) [15].

In India, rapid population growth, diverse cultural practices, and limited infrastructure create additional complexities in achieving sustainable WASH solutions. Despite significant government initiatives like the Swachh Bharat Mission and Jal Jeevan Mission, widespread issues like open defecation and inadequate waste management continue to threaten rural and urban health. Local governance and community involvement play a pivotal role in promoting sanitation and hygiene practices, yet rural sanitation coverage remains one of the lowest globally at 16%, on par with countries like Niger and Afghanistan.

This article examines the impact of government efforts in India, such as the National Water Supply and Sanitation Programme (1954), the Total Sanitation Campaign (1999) [4], and recent partnerships with organizations like UNICEF and USAID. Emphasis is also placed on the integration of WASH initiatives within waste management and recycling practices, highlighting the need for an inclusive, cradle-to-grave waste management model. This comprehensive approach aims to foster sustainable WASH practices, not only mitigating health risks but also creating an environment conducive to improved quality of life across communities.

Review of Related Studies

Studies on the effectiveness of WASH (Water, Sanitation, and Hygiene) interventions consistently emphasize the importance of local governance and community engagement. For instance, a study by Hathi *et al*. (2017) found that decentralized governance plays a critical role in improving sanitation practices and reducing open defecation in rural India. The study noted that when local leaders are actively involved in sanitation initiatives, there is a higher degree of community participation and awareness, leading to improved hygiene behaviors.

Similarly, a review by Whaley and Webster (2020) explored the impact of community-led WASH initiatives, such as Community-Led Total Sanitation (CLTS), in fostering sustainable sanitation behaviors. They found that local governance structures are essential in supporting CLTS programs, as community trust in local leaders and institutions enhances the uptake and sustainability of WASH practices. This study underscores that local governance enables culturally relevant and effective communication, making WASH initiatives more successful and sustainable.

Research by Fisher *et al*. (2018) on water governance in sub-Saharan Africa highlights that local water management bodies are instrumental in ensuring consistent access to clean water. Fisher's study found that empowering local institutions not only improved water supply systems but also built local capacity, making WASH interventions more resilient. The study further suggests that accountability and transparency in local governance are key factors for the successful implementation of water programs.

In a broader context, Garn *et al*. (2017) analyzed the effectiveness of national WASH programs across 84 countries, noting that strong local governance, particularly in rural settings, is a significant predictor of program success. Garn's review found that when local authorities are engaged, communities are more likely to adopt and maintain improved sanitation and hygiene practices. This study highlights the importance of tailoring national policies to support local governance structures for effective WASH implementation.

Lastly, a study by Isham and Kahkonen (2018) examined the role of community participation in WASH projects across Southeast Asia, showing that local governance improves project outcomes by involving community members in decision-making. The research found that projects with strong community engagement not only improved WASH services but also enhanced the sense of ownership among locals, leading to long-term maintenance and effectiveness.

Objective of the Study

- To elicit the socio economic profile of the Respondents.
- To analyse water supply, treatment practices, and usage patterns in the Gram Panchayats (GPs)in South Andaman District.

Methodology

The methodology for this study is a mixed-methods approach, combining both quantitative and qualitative data collection techniques to assess the effectiveness of water supply, sanitation, and hygiene (WASH) practices in rural areas under the Jal Shakti Abhiyan (JSA), with a specific focus on the Andaman and Nicobar Islands. A survey was conducted with 1300 households across various Gram Panchayats (GPs) in the region to collect quantitative data on demographic information, awareness, water usage patterns, and the frequency and quality of water supply. Structured questionnaires were used to gather information on water treatment practices, payment modes, and water facility types. Additionally, in-depth interviews and focus group discussions were held with key stakeholders, including community leaders, Gram Panchayat members, and local residents, to gain qualitative insights into the challenges faced by rural communities in accessing and managing water resources, particularly in the geographically isolated and ecologically sensitive Andaman and Nicobar Islands. The data was analyzed using statistical methods for quantitative data and thematic analysis for qualitative data, enabling a comprehensive understanding of the role of local governance in effective WASH implementation and the impact of government initiatives like JSA in improving water access and quality in these unique island communities.

Result and Discussions

Table 1: Age and Marital Status of the Respondents

Variables		Frequency	Percent
Age	< 25	250	19.2
	26-35	384	29.5
	36-45	330	25.4
	Above 46	336	25.8
	Total	1300	100.0
Marital Status	Married	860	66.1
	Unmarried	354	27.3
	Widow	52	4.0
	Divorce	12	0.9
	Separated	22	1.7
	Total	1300	100.0

The table 1 provides insights into the age distribution and marital status of 1,300 respondents. The majority of respondents (29.5%) fall within the 26-35 age group, followed by those aged 36-45 (25.4%) and above 46 (25.8%). Respondents under 25 represent 19.2% of the sample. This distribution indicates a relatively balanced representation across age groups, with a slight concentration in the 26-35 category. Regarding marital status, a significant majority (66.1%) are married, while 27.3% are unmarried. Minority groups include widows (4%), divorced individuals (0.9%), and those separated (1.7%).

Table 2: Religion and Community

Variables		Frequency	Percent
Religion	Hindu	732	56.3
	Muslim	160	12.3
	Christian	324	24.9
	Sikh	62	4.8
	Others	22	1.7
	Total	1300	100.0
Community	SC	36	2.8
	ST	68	5.2
	OBC	404	31.1
	GEN	792	60.9
	Total	1300	100.0

The data suggests that married individuals predominantly represent the sample, potentially impacting interpretations related to social and economic factors, as marital status often influences these aspects.

The data on religion and community among 1,300 respondents reveals that a majority (56.3%) identify as Hindu, followed by Christians (24.9%) and Muslims (12.3%), with smaller representations from Sikh (4.8%) and other religions (1.7%). This distribution highlights a predominant Hindu demographic, with notable representation from Christian and Muslim communities. Regarding community classification, most respondents belong to the General (GEN) category (60.9%), while a smaller portion belongs to Other Backward Classes (OBC) at 31.1%. Scheduled Tribes (ST) and Scheduled Castes (SC) comprise 5.2% and 2.8%, respectively. This demographic breakdown shows a predominance of individuals from the General category, potentially influencing the socio-economic perspectives within the sample.

Table 3: Education and Occupational Status

Variables		Frequency	Percent
Education	No formal education	82	6.3
	Primary education	184	14.2
	Secondary Education	340	26.2
	ITI/Dip	362	27.8
	Graduate & above	332	25.5
	Total	1300	100.0
Occupation	Home maker	306	23.5
	Self Employed	198	15.2
	Agri Labor	74	5.7
	Business	32	2.5
	Private	284	21.8
	Others	178	13.5
	Total	1300	100.00

The educational and occupational profiles of the 1,300 respondents reflect diverse backgrounds. In terms of education, a significant portion has attained secondary education (26.2%) or vocational qualifications, such as ITI or diploma (27.8%), while a quarter (25.5%) hold graduate or higher degrees. Only a small fraction have no formal education (6.3%), and 14.2% have completed primary education. This distribution indicates a generally educated sample with a substantial representation of higher education levels. Occupationally, the largest group consists of homemakers (23.5%), followed closely by those in private employment (21.8%) and self-employed individuals (15.2%). Smaller percentages are in agricultural labor (5.7%) and business (2.5%), with 13.5% in other various occupations. This occupational variety suggests a balanced sample of individuals with diverse income sources, potentially affecting lifestyle and economic behavior insights within the study.

The data on family type and monthly income of the 1,300 respondents shows a majority (62.5%) living in nuclear families, while 37.5% reside in joint family arrangements. This prevalence of nuclear families reflects a shift towards smaller family units, possibly influenced by urbanization and economic factors. In terms of monthly income, the largest income bracket is between Rs. 5,001-10,000, comprising 27.4% of the respondents, followed by 23.7% in the Rs. 10,001-15,000 range. Lower-income households (below Rs. 5,000) make up 13.8% of the sample, while a similar proportion (13.3%) earn above Rs. 25,000. This income distribution suggests a predominance of lower- to middle-income households, which may influence their access to resources and living standards.

Table 4: Family Type and Family Income

Variables		Frequency	Percent
Family Type	Nuclear	812	62.5
	Joint	488	37.5
	Total	1300	100.0
Monthly Income in Rs/-	Below 5,000	180	13.8
	5,001-10,000	356	27.4
	10,001-15,000	308	23.7
	15,001-20,000	124	9.5
	21,001-25,000	160	12.3
	Above 25,000	172	13.3
	Total	1300	100.0

Table 5: Awareness of Jal Shakti Abhiyan

Variables		Frequency	Percent
Awareness of JSA	Fully Aware	1048	80.6
	Partially Aware	252	19.4
	Total	1300	100.0
Adequate water supplied by Gram Panchayat	Regular	918	70.6
	Occasionally	362	27.8
	Not regularly	20	16
	Total	1300	100.0

The result on awareness of the Jal Shakti Abhiyan (JSA) and water supply adequacy by the Gram Panchayat reveals strong engagement with water conservation efforts among respondents. A substantial majority (80.6%) report being fully aware of the JSA, with an additional 19.4% partially aware, indicating effective outreach and dissemination of information about this government initiative. Regarding water supply, 70.6% of respondents indicate receiving regular water from the Gram Panchayat, while 27.8% receive it occasionally, and a very small fraction (1.6%) report irregular access. This suggests that while awareness is high, there are still challenges in consistent water distribution that could be addressed to enhance the reliability of local water resources.

Table 6: Mode of Payment for Water Supply in GPs

Variables		Frequency	Percent
Payment Mode	Regularly Pay	954	73.4
	Occasionally Pay	334	25.7
	Not Regularly	12	0.10
	Total	1300	100.0
Monthly Payment Amount	Rs.30	1202	92.5
	Rs.50	84	6.5
	Rs.80	4	0.3
	Rs.100	8	0.6
	Above Rs.100	2	0.2
	Total	1300	100.0

The table shows that the mode and amount of payment for water supply in Gram Panchayats (GPs) shows that a majority of respondents (73.4%) make regular payments for water, with 25.7% paying occasionally and only a small fraction (0.1%) not paying regularly. This reflects a strong

commitment to financially supporting local water services. In terms of monthly payment amounts, the vast majority (92.5%) pay Rs. 30, a relatively affordable rate, while a smaller number of respondents pay higher amounts: 6.5% pay Rs. 50, and minimal percentages pay Rs. 80, Rs. 100, or above. This pricing structure suggests that water supply costs are generally kept low, making it accessible for most residents while also ensuring community contributions towards sustainable water management in GPs.

Table 7: Type of facility and Quality of Water

Variables		Frequency	Percent
Type of water facility	Piped water	1020	78.4
	Community tap	66	5.1
	Well	22	1.7
	Rainwater collection	90	6.9
	Others	102	7.8
	Total	1300	100.0
Quality of water	Semi potable	324	24.9
	Fully Potable	976	75.1
	Total	1300	100.0

The data on water facility types and quality highlights the reliance on piped water, with 78.4% of respondents using this as their primary source. Smaller percentages use other sources such as rainwater collection (6.9%), community taps (5.1%), wells (1.7%), or other facilities (7.8%), indicating a diverse range of water access methods in the community. Regarding water quality, 75.1% of respondents report having fully potable water, which signifies safe drinking standards, while 24.9% have access to only semi-potable water. This suggests that while most residents benefit from reliable and safe water, there remains a need to improve water quality for a portion of the population to ensure universal access to potable water**.**

Table 8: Frequency and Duration of Water Supply

Variables		Frequency	Percent
Frequency of Water Supply	Alternative days	252	19.4
	Three days once	762	58.6
	Four days once	286	22.0
	Total	1300	100.0
Duration of Water Supply	More than 30 mins	296	22.8
	20-25 mins	666	51.2
	15 mins	210	16.2
	No fixed time	128	9.8
	Total	1300	100.0

The data on the frequency and duration of water supply reveals that the majority of respondents (58.6%) receive water every three days, while 22.0% report receiving water every four days, and 19.4% receive it on alternate days. This distribution suggests that water supply schedules are not entirely consistent, with some areas experiencing more intermittent access. In terms of duration, most respondents (51.2%) have water supplied for 20-25 minutes, followed by 22.8% who receive water for more than 30 minutes, and 16.2% who have access for only 15 minutes. A smaller portion (9.8%) reports no fixed time for water supply, which may reflect irregularity in the water delivery system. Overall, while water supply is fairly regular, the duration and scheduling indicate room for improvement in ensuring more reliable and sufficient water access for all.

Table 9: Water Treatment and Usage

Variables		Frequency	Percent
Water treatment before use	Filtration	246	18.9
	Boiling	336	25.8
	Fit Kari(Alum)	460	35.4
	Strain it through cloth	208	16.0
	No Treatment	50	3.8
	Total	1300	100.0
Usage of Water	Drinking	280	21.5
	Washing	314	24.2
	Cooking	506	38.9
	Bathing	156	12.0
	Agriculture	44	3.4
	Total	1300	100.0

The data on water treatment and usage shows a diverse range of practices among respondents. A significant proportion (35.4%) of people treat their water using alum (Fit Kari), followed by boiling (25.8%) and filtration (18.9%). A smaller portion (16.0%) use cloth filtration, while 3.8% do not treat their water before use, which could pose health risks. In terms of water usage, the majority (38.9%) use water for cooking, followed by washing (24.2%) and drinking (21.5%). Bathing (12.0%) and agriculture (3.4%) account for smaller proportions of water use. These figures highlight the critical role of water treatment in ensuring safety, especially considering its primary uses for cooking, drinking, and washing, all of which require clean water to prevent waterborne diseases.

Conclusion

The study on water supply, treatment, and usage in the Gram Panchayats has provided valuable insights into the access to and management of water resources in the region. The findings indicate that there is a high level of awareness about water conservation initiatives like the Jal Shakti Abhiyan, with the majority of respondents being fully aware of the program. This awareness is complemented by relatively regular water supply systems in most areas, though variations exist in the frequency and duration of water supply.

The study also reveals that the majority of respondents rely on piped water, and the water quality is generally deemed good, with most respondents reporting access to fully potable water. However, some challenges remain, particularly with regard to water treatment practices, where a significant portion of the population still treats water through methods such as boiling, alum, or filtration, suggesting that water treatment infrastructure could be further improved to ensure better health outcomes.

In terms of water usage, the study highlights that cooking is the primary use of water, followed by washing and drinking. A smaller proportion of water is used for agricultural purposes, underscoring the need for more focused policies that address agricultural water needs.

Overall, the study underscores the effectiveness of the Jal Shakti Abhiyan in raising awareness and improving access to water in rural areas but also highlights areas where interventions could be made to enhance the consistency of water supply, improve water treatment practices, and

address the specific needs of agriculture and rural households. Enhancing infrastructure, improving water treatment facilities, and ensuring a more equitable distribution of water are critical steps toward achieving sustainable water management in the region.

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