

# Water & Gender Insecurity In India: A Case Of Tier II State Capital City Of Lucknow Feminist Participatory Approach To Rurban Sustainability



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## Abstract

One of the fundamental human right constitution of India in determining one's health and well-being is having access to clean water. Piped water supply in India is available to 60 percent of the households in urban fringes which does not suffice to the minimum requirement of consumption considered to be 90 LPCD (according to URDPFI 2016). It is a common phenomenon in rural and urban fringe areas for female folks to fetch the deficit water for their household necessity. Water collection in fringe area faces challenges for gender insecurity in terms of physical, and social aspects. The objective of this research is to explore the critical issues of women's security in the process of collection of water from static water bodies and brings out how Rurban sustainability practices can solve such issues. For this purpose a primary survey has been conducted, this study will focus on recognizing the existing barriers and methodological challenges in understanding and quantifying gender inclusiveness in water supply sector of Rural and urban planning process. Lucknow city has been taken which is Tier II state capital city, state capital city of State, Uttar Pradesh in India. The primary data collection involves the process of questionnaires through primary surveys. The quantitative data analysis involves parameters like frequency of water collection, distance travelled to static water bodies, time and other relevant parameters.

This research paper investigates attributes of gender-inclusive planning, specifically exploring the gender dynamics of Water consumption and access to safe water as per required quantity and quality contributing to the session's goal of fostering feminist participatory methods for inclusive planning.

**Keywords:** Water collection, urban fringe, women insecurity, Rurban sustainability, Gender-inclusive planning

## 1. Introduction

### 1.1. Urbanization and requirement of water supply

Cities are experiencing rapid urbanization due to population influx to urban areas. Due to step wise migration from rural areas and urban fringes every second the urban population grows by two people worldwide. The demand for water supply is significantly impacted by Immigration. The need for clean and adequate water supplies increases as more people move into cities and metropolitan areas.

The demand for water for drinking, sanitation, and other domestic uses rises significantly as more people reside in congested urban locations. In general, urban lifestyles the consumption of water is significantly more than that of rural ones. The requirement for water in cities has grown due to a number of factors, including indoor plumbing, larger dwellings, and water-intensive industries.

Taking about the global context 41% of rural households lack access to safely managed drinking water within their households according to SDG 2030 Report. The distance to the principal source of drinking water for these households falls within the

range of 0.2 to 1.5 km or more.

By 2030, 40% of India's population is expected to reside in cities. Up from 34% in 2011. 31% of urban households lack access to piped water or public tap water. 67.3% of urban Indian households are not connected to a piped sewage discharged system. 48% of the urban water supply in India comes from groundwater, according to the Centre for science and environment. With this India makes up 18% of the world's population, with a share of water resources of less than 5%. [1]Relying too heavily on underground water causes excessive removal, leading to decreased water levels and exhaustion of this essential resource. This can result in wells and bore wells running out of water, causing a shortage of water. This difference makes India highly vulnerable to water stress and scarcity, impacting everyday life. It increases the possibility of disputes over water resources among various regions and users. Failure to address the strain on water resources can result in economic difficulties, food insecurity, and social unrest unless sustainable water management and conservation practices are implemented.

The ever increasing dependence on groundwater,

combined with the nation's limited portion of worldwide water resources, underscores the unsustainable state of current methods. This scenario underscores the critical requirement for extensive enhancements in urban development and water administration to support the expanding population and avoid potential setbacks.

Meeting the needs of expanding urban populations demands an extensive network of water supply and distribution infrastructure. This activity is aimed at building water treatment facilities, pipelines, tanks and sewage systems on demand for uninterrupted access to clean drinking water and responsible waste management. Urban areas are growing so quickly that filling the demand of creation of additional water supplies to maintain water for all essential needs. Additionally urbanization can harm water quality through elevated levels of industrial pollution, storm water runoff from impervious surfaces and insufficient treatment of the residential sewage. Urban Planners, policymaking and decision-makers must make the provision of safe drinking water as the most important item on their agenda.

### 1.1.1.Scenario of metropolitan cities due to urbanization.

As per WWF (World Wide Fund for nature) Indian report, 30 cities have been listed which will face a grave water risk by 2050 due to sharp increase in the population. The problem arise due to the Poor management of water sources, polluted supplies, leaking distribution networks, and massive amounts of untreated wastewater dumped into India's rivers are just a few of the issues. [2]

Severe water shortages have been affecting Indian cities due to rapid, unplanned development and population increase. According to a 2018 study that appeared in Nature, Jaipur would have the second-highest global water deficit by 2050, behind Chennai at number 20. According to a 2020 World Wide Fund for Nature (WWF) research, rapid population growth will put 30 Indian towns at risk of "grave water risk" by 2050. [2]

The current state of affairs is alarming. In recent years, storage levels in the 91 largest reservoirs that the Central Water Commission keeps an eye on have never surpassed half of their total capacity. More concerning, the long-term, indiscriminate mining of groundwater is causing a severe decrease in water tables in most Indian towns. Seven of the ten most populous cities in India have seen a sharp decline in groundwater levels over the past 20 years, accounting for 48% of the nation's urban water supply. Lucknow is also one of the city from Uttar Pradesh that has been in alarming situation due to ground water depletion as per the report of Center for science & environment. [3]

### 1.2.Role of women in water collection

The collection of water is primarily a woman's job in

many urban and peri-urban areas around the world. This responsibility is not only affecting their daily lives, but also having an impact on the overall wellbeing, economic status and opportunities. Hence it needs to be empowered.

While previous national rural water supply standards regarded 40 LPCD as the minimal basic requirement for domestic usage, the Jal Jeevan Mission's rural water supply rules in India recommend a service level of 55 LPCD for rural households. As a result, water availability below this level is often considered inadequate as it fails to meet essential daily activities and may result in poor cleanliness, additional hours required collecting water, and greater stress in the household. Water availability commonly falls below 40 LPCD in many rural and peri-urban peripheral areas where households rely on hand pumps, bore wells, or tanker supplies, indicating situations of water scarcity and inadequate service. [4]Water collection is generally viewed as a gendered activity in locations where there is a shortage of water or among homes where the primary water source is outside the domestic premises. Women and girls are inevitably responsible for the majority of the time spent collecting water. [4]

UN Women forum based on the agenda of SDG 2030 clean water & sanitation analyzed the data from 61 countries, 80 % percent of water deprived household, women carry the burden of water collection with spending 200 million hours every day in collection of water. In order to address gender inequalities and promote sustainability, it is crucial to understand the dynamics of women's participation in water harvesting. [5, 5]

Challenges Faced by Women/girls in Water Collection during collection of water for families:

- Limited access to infrastructure: Women / girls are frequently forced to go far in order to collect water from community sources like taps or wells, because they do not have sufficient access to the city and peri-urban piping networks. Significant time and energy costs can be incurred as a result. Health risks associated with carrying large water containers over longer distances, such as injuries to the bones or exposure to dangerous sources of drinking water, may be encountered by women.
- Time poverty: time spent on water collection deprives women of the opportunity to learn, earn a living, or pursue leisure activities which prolong cycles of poverty and dependency.
- Gender-Based Violence: Women and girls may face harassment or violence while fetching water, particularly in areas where water sources are distant or located in unsafe environments.

For addressing gender insecurities due to lack of water supply, the Lucknow city has been taken for the analysis of parameters responsible for gender insecurities.

### 1.3.Process of collection of water

The complete water acquisition cycle for households in an area without in-house water supply can be described as the three sequential stages of (1) walking from the household to the water source, (2) reaching the collection point and fetching water, and

(3) walking back home with the collected water, which can be used to systematically extract and analyze key parameters such as travel distance, time spent accessing the source, waiting time at the collection point, and the overall duration of the collection trip to evaluate the accessibility and burden of water collection.

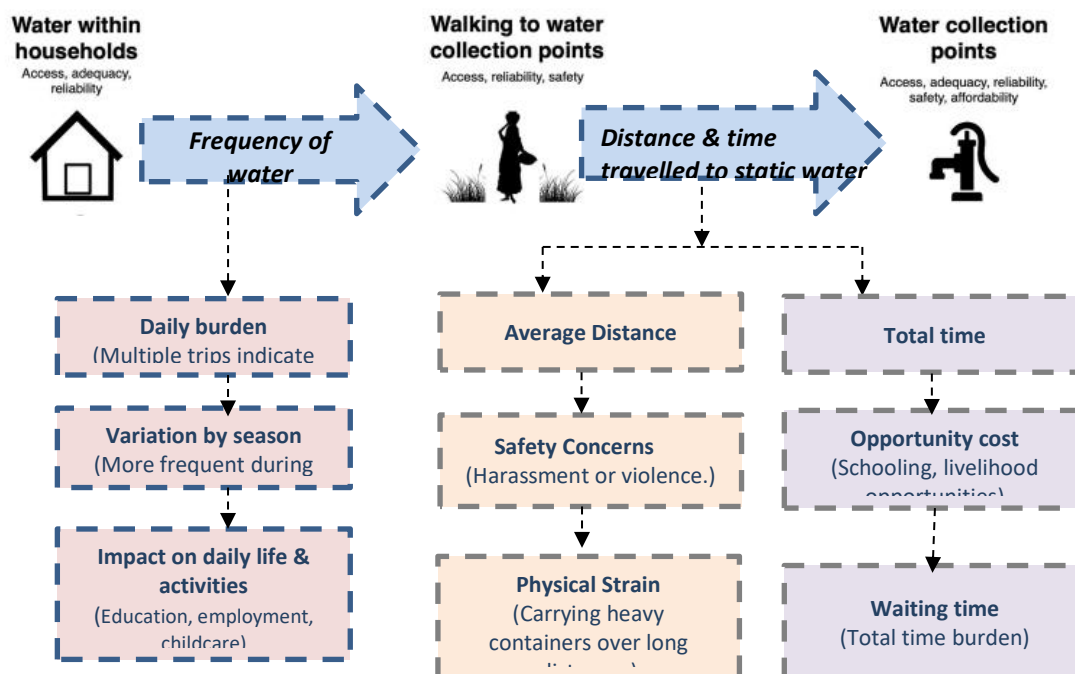


Chart 2.4.1. Sub categorization of parameters flow chart

Source: Author

## 2.Literature

### a.Peri urban areas

The terminology of the Peri- Urban has originated from the word 'peripheral' (Janakarajan, 2010).The peri-urban area is characterized by high and often increasing population density, rural households and minority neighborhood population, diverse sources of income, pollution, environmental problems, and increased use of resources, significant economic dynamism and a severe lack of services. [6]

Notwithstanding these insights, understanding the peri-urban as a heterogeneous conglomeration of rural-urban features has resulted in an underlying assumption in the literature that the peri-urban is 'placed based'. It's often referred to as the "midway between urban centers and rural areas", while at the same time it's lying between cities and states in order

to meet the needs of cities and local needs. i.e., identified, by a continuous exchange of people, production, finance, workforce and other utilities moving outwards from the urban area and travelling inwards into the city. The problem of peri-urban areas is due to changes in land use. Similarly, there is a strong link between the activities in these fields and the cities' needs. [6]

Peri-urban areas may be divided in two parts:

I) Urban Fringe: area adjacent to and within the city boundary that is directly affected by urban development, as it grows rapidly.

II) Area beyond the Urban Fringe: The primary concern is to create new villages in these areas, maximizing their profit from the periphery by conversion of agricultural land into another use other than agriculture.

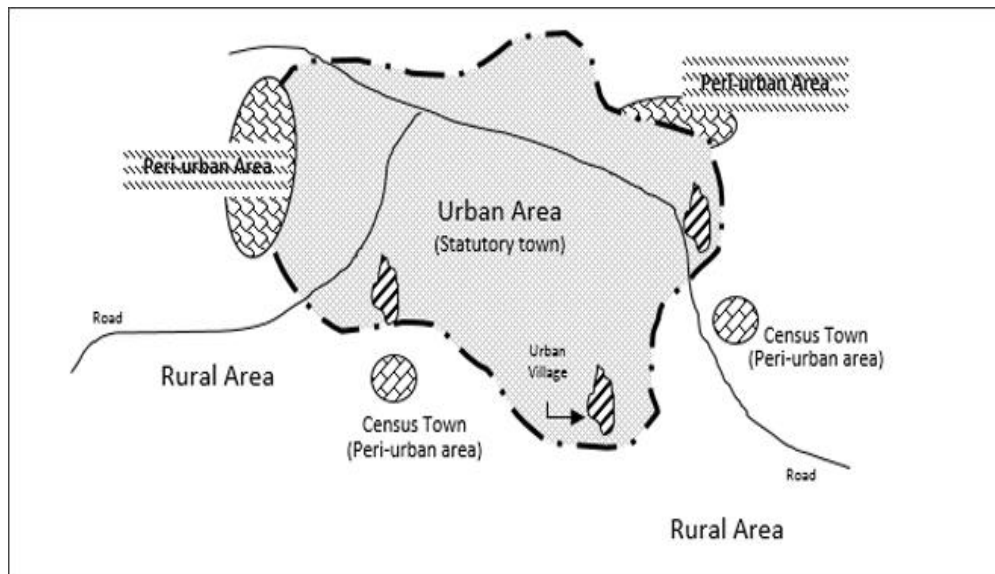


Figure 1.2. visual representation of urban and peri urban area

Source: TCPO report, 2020

### 3.Selection of study area

Lucknow is the capital of Uttar Pradesh, one of India's largest states in terms of population and area. In view of the increasing urbanization, Lucknow has been divided into two parts, namely Old Lucknow and New Lucknow.

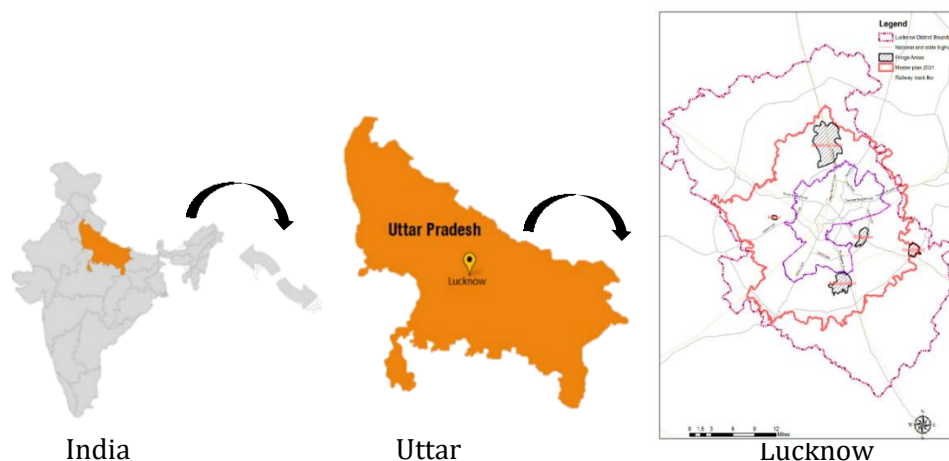
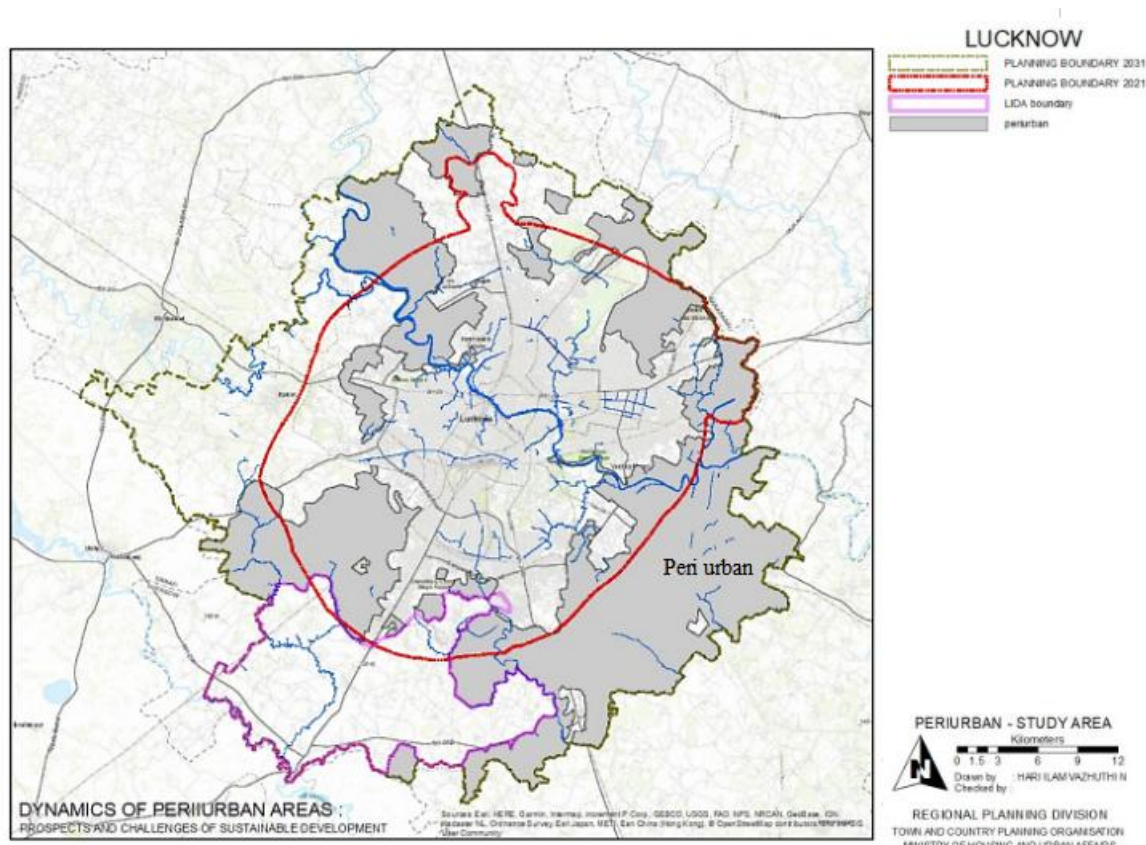


Figure 2.1. Location aspects of Lucknow

Source: Author

#### a.Fringe areas of Lucknow

We can see Lucknow's location in the map. The river flows through the city and is geographically has bifurcated into two parts popularly known as Trans Gomti, Cis Gomti Sub City in Lucknow. The first part forming the core of Nawabian and British Evolution of city structure and form, while the second half is urban sprawl of post independent evolution of city structure and form. Grey part indicates the peri-urban areas including the fringe areas and areas beyond the urban fringes. (Map 2.1)



Map 2.1. Lucknow map showing peri urban area  
Source: regional planning division, TCPO 2020

#### b. Peri-urbanization process of Lucknow and status of water supply

The city has seen steady increase in population arising from natural growth, incorporation of peri urban areas in 1980's and a large-scale migration. The population growth projected in master plan 2031 highlights the total population rise of 9 lakh out of which urban agglomeration highlights the rise in population.

| AREA, POPLATION AND POPULATIN DENSITY CHART OF LUCKNOW MUNICIPAL CORPORATION (LMC) |               |                            |                            |                       |
|------------------------------------------------------------------------------------|---------------|----------------------------|----------------------------|-----------------------|
| DESCRIPTION                                                                        | AREA (SQ. KM) | POPULATION (IN LAKHS) 2001 | POPULATION (IN LAKHS) 2011 | DENSITY (PER./SQ. KM) |
| LUCKNOW DISTRICT                                                                   | 2528          | 36.47                      | 45.89                      | 1816                  |
| PLANNING AREA                                                                      | 1050          | 22.45                      | 35.48                      | 3379                  |
| URBAN AGGLOMERATION                                                                | 377.5         | 23.20                      | 30.38                      | 7629                  |
| LMC AREA                                                                           | 348.80        | 21.54                      | 28.17                      | 8049                  |

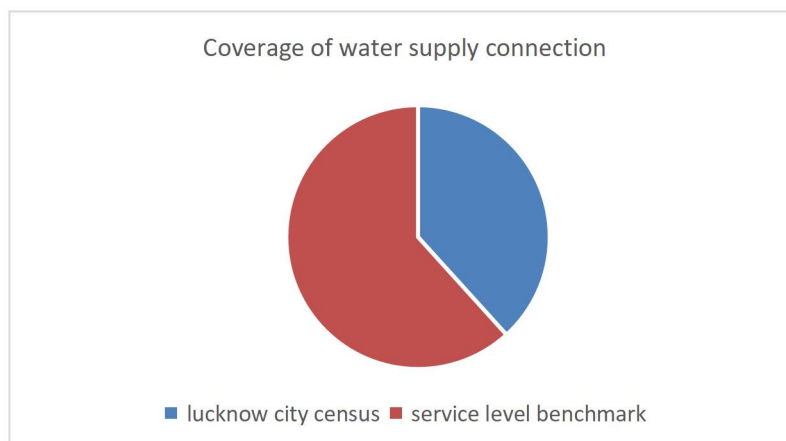
Table 2.2.1. Showing major population, area and density of Lucknow municipal area  
Source: Lucknow master plan 2031, census 2001, 2011

The water delivery network covers the majority of the central city and its surrounding areas. While over 90% of the population living inside municipal boundaries is supplied with water via a piped system, over 10% is supplied with hand pumps. About 30% of people who live in places with piped water supplies in Lucknow, do not receive water as per the design demand since the city's water supply is irregular the population spend considerable resources on intermediate systems and tube wells to manage or augment the supply. This is costly and mostly beyond the reach of the poor. [7] Apart from

the urban areas peri urban areas and urban fringes faces a lot of challenges regarding the water supply due to unavailability of water supply network. Hand pump or fetching water from nearby surface water resources are their primary source of water collection. With respect to the service level benchmark according to the provisions of water supply. A Handbook on Service Level Benchmarking has been developed and released by the MoUD 2018. [8] It seeks to identify a minimum set of standard performance parameters for the water and sanitation sector that are commonly understood and used by all stakeholders across the country. pie chart 1 below

shows there has been a surplus per capita supply of water i.e., 150LPCD with only 62% of households are

having water supply connection in the city, which doesn't cover the new fringes areas and slums.



*Chart 1. chart showing the coverage water supply connection*

*Source: Author*

#### 4. Methodology

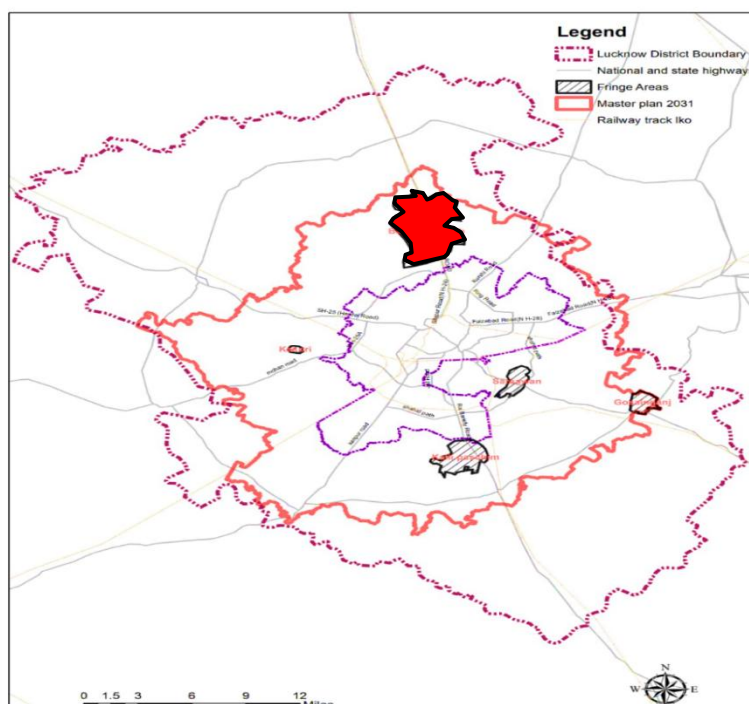
This is a cross-sectional study using mixed methods of data collection. The first method of research includes primary data collection which included surveys and semi-structured interviews. The second method involves secondary data collection. The sample size selected for the study is 0.1% of the total household size of the selected area.

The parameters taken into account for this analysis are extracted according to the function performed during the entire process, which starts from the household to the water collection points and finally

returns after the household has collected water, and the distance and time travelled to the static water bodies, with their sub- parameters as shown in the parameter flow diagram 2.4.1.

There are total 5 peri urban areas in Lucknow city and analysis is done on the basis of the major identified parameters.

The city's fast expanding urban population and high migration rate spread to the peri-urban and rural areas that surrounding the city. The city spans an area stretching from Mohanlal Ganj (Lok Sabha Constituency) in the south to Bakshi ka Talab in the north and Kakori in the west.



*Map 1.3.1. Map showing the 5 fringe areas*

*Source: Author*

Table 1.3.1. Table showing population and area distribution of fringe areas

| S.NO | NAME            | AREA(IN SQ.KM) | POPULATION | DISTANCE FROM CENTRE |
|------|-----------------|----------------|------------|----------------------|
| 1    | BAKSHI KA TALAB | 41.9           | 49166      | 17                   |
| 2    | KAKORI          | 3              | 19403      | 19                   |
| 3    | KALI PASHCHIM   | 14.4           | 12157      | 16                   |
| 4    | SARSAWAN        | 6.06           | 10655      | 9                    |
| 5    | GOSAINGANJ      | 5.9            | 9649       | 22                   |

Source: Author

The highlighted part Bakshi ka Talab has been selected as a study area for the analysis as it covers the greater population in all fringe areas. Bakshi ka Talab Nagar panchayat is part of the Bakshi ka Talab sub district of the Lucknow district which is handled by the Lucknow development authority (LDA). It was built in 1807 when King Tripuresh Chandra Bakshi stopped in the region enroute to Nepal. Overall, the sources of the water supply have been found relatively better (municipal sources) in the peri urban locations (14 km, 6km and 3 km) (refer table 2.3.1) than in the far way locations namely Bakshi ka Talab and Gosaiganj. One of the reason could be: they are newly formed municipal bodies with the unmatched financial and technical capacity to ensure the basic infrastructure provisioning such as water supply system. The quality of water from these man sources are of concern in these peri urban locations.

## 5. Conclusion

The above research has led to number of interesting facts that urban or rural areas experience greater rural-urban expansions when cities are situated on the outskirts of these zones. Expansion outward is associated with stability and maintaining law and order, making it important to focus on various policies and regulations. The rapid urbanization and overlap of rural and urban areas is a significant issue in three key Asian countries, with India being one of them. This complexity becomes especially challenging due to the extensive cultural and economic diversity present.

Above all, the results also explained that why women still encounter difficulties carrying out their daily responsibilities related to managing water in the household. Gender is an underlying theme that pervades through each of these sets of factors. [8] The experiences of gender insecurity and discrimination for women are shaped in complex ways by the intersection and interaction of these parameters and issues. Comprehensive and

integrated strategies are needed to address these challenges, tackling root causes and promoting gender equality in all aspects of life, shaping it with SDG, Goal 5 of the 2030 Agenda for Sustainable Development aims to 'achieve gender equality and empower all women and girls.'

Some of the key recommendations for a basic improvement in the city includes:

### 1. Policy Interventions:

- policies prioritizing women's access to water, protecting from gender-based violence

### 2. Awareness and Education

- Forming awareness campaigns with the involvement of NGO, s & government.

### 3. Community-Based Solutions:

- Involves feminist participatory approaches.

## 6. Implementations Of Survey Findings

The primary suggestion made by this research is that improved water supply program structures need to be reframed. With one of the key recommendations based on community-based solution a short-term Methodology for Female Participatory Approach can be developed that can improve the challenges faced by women while collecting water and overlapping it with ongoing Rurban sustainability policy initiatives that can improve better infrastructure facility in fringe areas.

This methodology will emphasize the importance of feminist principles, participatory approaches, and gender-sensitive strategies in addressing gender-based violence due to water insecurities in Rurban areas of India. By centering the voices and experiences of women, marginalized communities, and grassroots stakeholders, this approach aims to create sustainable, inclusive, and equitable water systems that advance gender equality and social justice.

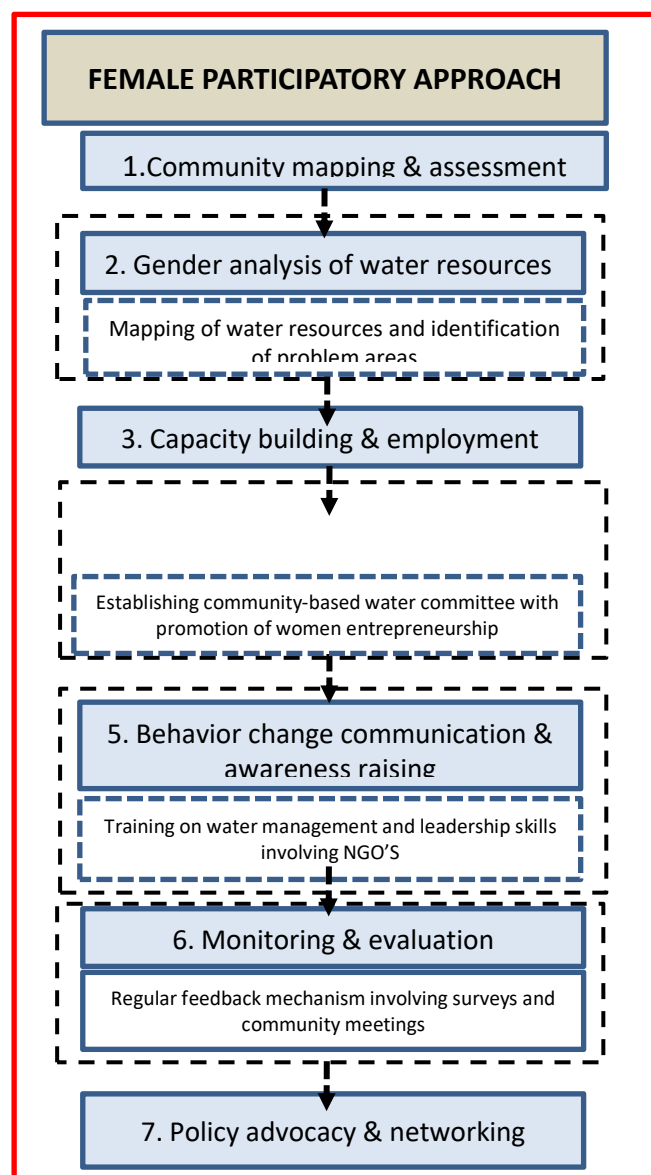


Chart 3.5.1. Sequential steps for the female participatory approach

Source: Author

### 1. Community Mapping and Needs Assessment

**Objective:** Identify the specific needs and issues related to gender insecurity and access to water in urban settings

**Process:** Conduct community mapping activities to identify major sources of water, vulnerable areas, and areas of low access; organize focus group discussions (FGDs) and interviews with women, community leaders, and self-help groups (SHGs) to understand the challenges related to water (e.g., time to collect water, safety, health impacts); use tools such as participatory rural appraisal (PRA) to document community priorities and perceptions, with an emphasis on women in the assessment process.

### 2. Gender Analysis of water resources

**Objective:** Map water resources and areas where water resources are of concern and where gender violence and eve teasing are prevalent.

**Process:** Analyze the availability, quality, and infrastructure of water resources in the target urban regions, including how gender differences exist in access to water (who manages resources, who decides how to use water, and how does scarcity affect men and women), the specific impacts of water scarcity on women's safety, health, education, and livelihoods, and mapping of current water resources and social practices affecting women's access and management.

### 3. Capacity Building and Empowerment

**Objective:** provide necessary training to women to participate in water governance and management.

**Process:** Organizing workshops for women on sustainable water management practices.

Exploring collaborative learning approach where women can share their own experience and learn something new about water management.

### 4. Gender responsive infrastructure

Objective: enhancing education and awareness amongst women to establish a community water committee.

Process: promoting women to initiate with local governments and NGOs to implement these infrastructure projects, prioritizing areas where women face the most significant challenges in accessing water.

### 5. Behavior changes communication & awareness raising

Objective: promoting non-discriminatory water management practices.

Process: Develop and implement gender-sensitive communication initiatives that highlight the significance of water conservation, and equality for women in water management.

### 6. Monitoring & evaluation

Objective: interventions on gender & water insecurity.

Process: Create a framework for participatory monitoring and evaluation (M&E) that takes gender equality into account when creating indicators to evaluate the advancement of gender equality in water management.

### 7. Policy advocacy & networking

Objective: overlapping existing policies and build network to support the participatory feminist approach.

Process: Establish partnerships with governmental bodies, NGO's, educational establishments, and global organizations to pool resources and knowledge to advance feminist approaches to water governance.

By tackling the interconnected problems of gender inequality, and water availability, the Feminist Participatory Approach to Rural Sustainability linked to Water and Gender Insecurity in India directly contributes to the achievement of SDG 6. It guarantees that women's needs and voices are important to the planning, execution, and control of water resources, acknowledging the crucial role that women play in water management. This methodology not only supports SDG 6 but also advances the more general goals of gender equality (SDG 5), sustainable cities and communities (SDG 11), and decreased disparities (SDG 10). It does this by promoting inclusive and sustainable water practices.

women," p. 1, March 2024.

6. U. FORUM, "clean water and sanitation".
7. TCPO, "Dynamics of peri-urban area prospects and challenges of Sustainable development- a Case study of Lucknow," March, 2020.
8. "City development plan, 2040," 2015.
9. M. o. H. a. u. affairs, "Minimum set of standard performance parameters".
10. G. J. P. B. Nandita Singh, "ENCOUNTERING THE CHALLENGES OF WATER RESOURCE MANAGEMENT IN RURAL INDIA FROM GENDER PERSPECTIVE," TRITA-LWR REPORT 3025, 2009.

### Reference

1. "National family health survey," 2015.
2. "world wide fund for nature," 2018.
3. C. f. s. & environment, "Indias urban water crises," 22 march 2021.
4. "jal jeevan mission report," 2019.
5. T. HINDU, "How water insecurity affects