ENVIRONMENTAL

Awareness Without Access: Water Conservation Awareness in Somatane, Raigad, Maharashtra

Atluri Koti Reddy, Suraj Rakesh Bhanushali, Bhushan Kumar Singh, Bhojraj Y. Shewale

Amity Business School, Amity University Mumbai, Mumbai, India

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Abstract

Water scarcity is an increasingly pressing concern in peri-urban and rural pockets of India that lie on the growth corridors of expanding metropolitan regions, where rising construction activity and in-migration place additional pressure on already limited traditional water sources. This paper reports the findings of a grassroots community outreach intervention conducted by a student research group in three localities — Somatane, Devloli and Dahivali — situated in Panvel taluka, Raigad district, Maharashtra, an area undergoing rapid peri-urban transformation on account of its proximity to the upcoming Navi Mumbai International Airport. Using a purposive, conversation-based field methodology, the study first conducted a community need assessment with approximately 22–25 respondents, comprising shop-keepers, households, senior citizens, children and a local real-estate business office, to gauge existing water usage patterns, sources and awareness of conservation practices. Informed by the gaps identified — principally a deficit of practical, 'how-to' knowledge rather than basic awareness of scarcity — the group designed and delivered a short, targeted awareness activity supported by a printed brochure, across two field visits conducted in August and September 2026. A follow-up visit indicated encouraging, if preliminary and self-reported, signs of behavioural recall and adoption among a subset of respondents. The paper situates these findings within the broader literature on water stress in India and Maharashtra, discusses the implications of grassroots, dialogic outreach as a complement to top-down conservation policy, and offers recommendations for community-level, school-based and builder-level interventions in rapidly urbanising village clusters. The study, while limited in sample size and generalisability, contributes a field-grounded, replicable model of low-cost community engagement that management and social-science students can adopt in similar settings.

Keywords: water conservation; community awareness; need assessment; grassroots outreach; peri-urban development; Panvel; Maharashtra; rainwater harvesting; behavioural change

1 Introduction

Water is a finite and increasingly contested natural resource, and its sustainable management has emerged as one of the defining developmental challenges of the twenty-first century. India, home to approximately 18 per cent of the world's population but only about 4 per cent of its renewable freshwater resources, is particularly exposed to this challenge (Central Water Commission, Government of India). The pressure is not confined to arid states or large metropolitan centres alone; it is increasingly visible in semi-urban and rural settlements located on the expanding edges of Indian cities, where real-estate development, construction activity and population inflow outpace the capacity of traditional water sources such as wells, hand pumps and small local water bodies.

This paper reports on a community outreach project undertaken by a group of three BBA Honours with Research students of Amity University Mumbai, under the guidance of faculty mentor Dr. Bhojraj Y. Shewale, in three such peri-urban localities — Somatane, Devloli and Dahivali — located in Panvel

taluka of Raigad district, Maharashtra. These localities lie in the immediate catchment of the upcoming Navi Mumbai International Airport and the associated residential real-estate corridor around Somatane railway station, making them a timely and relevant setting in which to examine community-level water awareness and practice.

The project combined two complementary components: first, a structured community need assessment to understand existing water usage behaviour, sources and awareness levels; and second, a conversation-based awareness intervention informed directly by the gaps identified in the assessment. This dual design allows the present paper to speak not only to the state of water awareness in the study area but also to the process and preliminary effectiveness of a low-cost, student-led outreach model that other researchers and practitioners may seek to replicate in comparable settings.

1.1 Problem statement

While national and state-level water policy in India has increasingly emphasised supply-side and infrastructural interventions — such as the Jal Shakti Abhiyan's 'Catch the Rain' campaign and various groundwater recharge schemes — comparatively less attention has been paid to documenting, at a hyper-local level, what ordinary residents of rapidly urbanising village clusters actually know and practise with respect to water conservation, and what specific informational gaps a low-cost community outreach activity can meaningfully address. This paper seeks to address that gap by presenting primary, field-based evidence from one such cluster.

1.2 Objectives of the study

1. To assess, through direct community engagement, the prevailing water usage patterns, sources and conservation awareness levels among residents and shopkeepers of Somatane, Devloli and Dahivali.
2. To identify the specific informational and behavioural gaps that a grassroots awareness intervention could realistically address within a short field engagement.
3. To design, implement and document a conversation-based water conservation awareness activity tailored to the needs identified, across a diverse cross-section of community members.
4. To assess, through a follow-up visit, preliminary indications of message recall and behavioural response among the community engaged.
5. To derive practical recommendations for sustaining and scaling water conservation awareness in similar peri-urban settlements.

1.3 Significance of the study

The significance of this study is threefold. First, it provides empirical, field-grounded insight into water awareness and practice in a specific peri-urban belt of Maharashtra that is undergoing rapid, largely unexamined transformation, thereby contributing a small but concrete data point to the broader literature on water stress in urbanising India. Second, it offers a replicable methodological template — purposive sampling, conversational need assessment, and tailored awareness delivery — that other student researchers, non-governmental organisations or corporate social responsibility teams could adapt for similar grassroots interventions. Third, for the student-researchers themselves, the project served as an applied exercise in primary data collection, community engagement and the

translation of research findings into actionable outreach, consistent with the research orientation of the BBA Honours with Research curriculum.

2 Review of literature

The literature on water scarcity and conservation in India can broadly be organised into three streams relevant to this study: (a) macro-level assessments of water stress and policy response, (b) studies on household and community water-use behaviour, and (c) literature on the role of awareness and grassroots communication in driving conservation behaviour.

2.1 Macro-level water stress in India

National assessments consistently point to a widening gap between water demand and availability in India. The Central Water Commission's periodic water resource statistics and the Central Ground Water Board's dynamic groundwater resource assessments have repeatedly flagged declining per-capita water availability and falling groundwater tables across several states, including Maharashtra. NITI Aayog's Composite Water Management Index similarly highlighted that a large share of India's population lives in areas of high to extreme water stress, with implications for both drinking water security and agricultural productivity. At the policy level, the Ministry of Jal Shakti's Jal Shakti Abhiyan, and its 'Catch the Rain' component in particular, represents a significant supply-side and infrastructural response, encouraging rainwater harvesting structures, check dams and groundwater recharge at scale.

2.2 Household and community water-use behaviour

A second stream of literature focuses on the behavioural dimension of water use — how households store, use, and in some cases waste water, and what factors predict the adoption of conservation practices such as rainwater harvesting or greywater reuse. Much of this literature converges on the observation that awareness of water scarcity as a general problem is typically high, even in the Indian hinterland, but that this awareness does not automatically translate into specific conservation behaviour, which instead depends on practical knowledge of 'how' to conserve, the perceived cost and convenience of doing so, and social or institutional reinforcement of the practice. This distinction between general awareness and actionable knowledge is central to the design of the present study's outreach intervention, as discussed in Section 4.

2.3 Grassroots communication and outreach as a conservation tool

A smaller but growing body of work examines the role of face-to-face, community-based communication — as distinct from mass-media campaigns — in shaping environmental behaviour. This literature suggests that direct, dialogic engagement, particularly when delivered by a trusted or locally embedded communicator and reinforced through follow-up contact, can be more effective at prompting incremental behavioural change than one-way informational campaigns, especially in lower-literacy or resource-constrained settings. Studies on child-mediated communication further suggest that engaging children as intermediaries can extend the reach of a household-level message, since children often relay and reinforce messages learned from external sources within the family. These insights directly informed the group's decision to combine shopkeeper, household, senior-citizen and child-focused interactions within a single outreach design, discussed further in Section 4.

2.4 Research gap

While macro-level water stress in Maharashtra and India more broadly is well documented, there is a comparative paucity of micro-level, field-based studies that document water awareness and practice in specific, named peri-urban village clusters undergoing active real- estate transformation — as opposed to either fully rural or fully urban settings. Moreover, few available studies pair a need assessment with an actual, documented outreach intervention and a short-term follow-up, as this study does. The present paper seeks to contribute to this gap through a small-scale but carefully documented, geo-tagged field study.

3 Study area

The study was conducted in three contiguous localities — Somatane, Devloli and Dahivali — within Panvel taluka of Raigad district, Maharashtra. These settlements lie approximately within the 18.90°N–18.94°N and 73.14°E–73.15°E coordinate band, in close proximity to the Somatane railway station and the upcoming Navi Mumbai International Airport. The area is characterised by a visible coexistence of traditional rural livelihoods — small kirana shops, household agriculture and manual labour — alongside active real-estate development, evidenced during the fieldwork by hoardings for multi-storey residential projects and an operating site office near the Somatane railway station.

Water sources in the study area, as reported by respondents, comprise a combination of municipal or piped supply, borewells, and community wells, supplemented during periods of shortage by water tankers. Supply was consistently described by respondents as irregular, particularly during the summer months, necessitating a degree of household-level storage. This combination of traditional water infrastructure and accelerating peri-urban demand makes the study area a particularly instructive setting in which to examine community water awareness and the scope for grassroots conservation outreach.

4 Research methodology

4.1 Research design

The study adopted a descriptive, field-based research design combining qualitative community engagement with a structured but conversational data-collection instrument. The design comprised two sequential phases: (i) a community need assessment, intended to generate primary descriptive data on water usage and awareness, and (ii) an outreach intervention, informed directly by the findings of phase (i), with a short follow-up to gauge preliminary behavioural response. This two-phase, intervention-linked design distinguishes the study from a purely observational survey and allows the paper to speak, albeit cautiously, to the effectiveness of the outreach approach and not merely to baseline awareness levels.

4.2 Sampling and respondent profile

A purposive sampling method was employed, given the exploratory and outreach-oriented nature of the project and the practical constraints of a short field engagement. Respondents were selected to represent a diverse cross-section of the local community rather than a statistically representative sample of the population, and included shopkeepers, homemakers, senior citizens, school-going children (with a supervising adult present) and a local real-estate business office. A total of approximately 22–25 individuals were engaged across the two field visits, as summarised in Table 1.

Table 1. Profile of respondents engaged during the field study.

Respondent Category	Approximate Number Engaged	Primary Mode of Interaction
Shopkeepers / small business owners	5–6	Face-to-face conversation at shop premises
Households (homemakers / family members)	6–8	Door-to-door conversation
Senior citizens	4–5	Group conversation in community/outdoor settings
Children / students	3–4	Supervised conversation with brochure support
Real-estate / business office representatives	2–3	Office-based conversation

Source: Field data, August–September 2026.

4.3 Data collection instrument and procedure

Data were collected through informal, conversational interviews guided by a short structured questionnaire covering five broad themes: primary water source, regularity of supply, perceived wastage, awareness of specific conservation techniques (notably rainwater harvesting and greywater reuse), and willingness to adopt new practices. This conversational method was preferred over a self-administered written questionnaire because it allowed natural probing of follow-up points and was better suited to respondents such as shopkeepers attending to customers and elderly residents who were more comfortable speaking than writing. Responses were recorded manually in a field notebook by the team member conducting each conversation.

Following the need-assessment conversation, each interaction transitioned into a short awareness component, in which two or three conservation tips — selected from a pre-prepared list and tailored to the respondent's context — were explained, supported where appropriate by a printed brochure. A follow-up visit approximately four weeks later allowed the team to revisit a subset of the same respondents and informally assess recall and self-reported behavioural change.

4.4 Field visits and data collection timeline

Table 2. Timeline and coverage of field visits.

Field Visit	Date	Localities Covered	Primary Focus
Visit 1	14 August 2026	Somatane, Dahivali	Need assessment and first awareness delivery
Visit 2 (Follow-up)	11 September 2026	Somatane, Devloli	Reinforcement and recall assessment

4.5 Tools and documentation

Field documentation relied on a notebook-based recording method supplemented by geo-tagged photography captured using the GPS Map Camera application, which embeds location coordinates, place name and timestamp directly onto each photograph. This provided an independently verifiable record of the location and timing of each interaction, two representative examples of which are reproduced as Figures 1 and 2 below.



Figure 1. Field data collection in progress — a researcher records a shopkeeper's responses on water source and usage during the community need assessment, Somatane, 14 August 2026.



Figure 2. Awareness delivery in progress — a researcher explains water conservation practices to senior residents during the follow-up field visit, Devloli, 11 September 2026.

4.6 Ethical considerations

Verbal consent was obtained from every respondent prior to the conversation and before any photograph was taken. Respondents were informed of the academic, non-commercial purpose of the engagement, and no personally identifying or sensitive information beyond general water-use views was recorded. The study did not involve any physical intervention, payment or inducement to respondents, consistent with standard ethical practice for low-risk, descriptive field research of this nature.

4.7 Limitations of the methodology

As a purposive, small-sample field study conducted within the time constraints of a single academic semester, this research does not claim statistical representativeness of the broader population of Panvel taluka or Raigad district, and its findings should be read as indicative and context-specific rather than generalisable. Behavioural outcomes reported in Section 6 are self-reported by respondents during the follow-up visit and were not independently verified through observation or metering, a limitation discussed further in Section 7.

5 Data analysis and findings

5.1 Water sources and supply regularity

Consistent with the semi-urban profile of the study area, respondents reported a mixed reliance on municipal or piped supply, borewells and community wells, with a minority depending partly on water tankers during periods of acute shortage. Supply was almost uniformly described as irregular rather than continuous, with respondents noting a marked drop in pressure or availability during the late afternoon hours and during the dry months preceding the monsoon.

5.2 Awareness and practice gap

A central finding of the need assessment, summarised in Table 3, is the presence of a pronounced gap between general awareness of water scarcity and specific, actionable knowledge of conservation techniques. While the overwhelming majority of respondents readily acknowledged water scarcity as a seasonal or recurring concern, markedly fewer could describe, even in broad terms, how a technique such as rainwater harvesting could be implemented at the household or shop level.

Table 3. Summary of awareness and practice indicators from the community need assessment.

Indicator	Observed Pattern (Field Assessment)
Awareness of water scarcity as a general concern	High — acknowledged by nearly all respondents
Awareness of the term ‘rainwater harvesting’	Moderate — most had heard the term
Ability to explain how to implement rainwater harvesting	Low — very few could describe a practical method
Existing practice of water storage during supply hours	Common — reported by a majority of households
Existing practice of greywater reuse or leak repair as routine habit	Low — reported by only a small minority
Visible local awareness material (posters, campaigns)	Absent — none observed in shops or public areas visited

5.3 Perceived sources of household and shop-level wastage

Respondents most frequently identified leaking taps and pipes, prolonged running water during utensil and clothes washing, and hose-based vehicle or floor washing as the principal sources of avoidable water wastage. These findings directly shaped the content of the awareness intervention, which prioritised low-cost, immediately actionable responses to precisely these behaviours — namely, prompt leak repair, bucket-based cleaning in place of running hoses, and the reuse of washing water for plants or floor cleaning.

5.4 Willingness to adopt conservation practices

A majority of respondents expressed willingness to adopt simple conservation measures, conditional on the information being explained clearly and practically — reinforcing the study's central finding that the primary barrier to conservation behaviour in the study area was informational rather than attitudinal. Several respondents specifically noted that they had never had such practices explained to them in a direct, personal manner before, as opposed to having heard about water scarcity in general terms through television or word of mouth.

5.5 Preliminary evidence of behavioural response

During the follow-up visit, several respondents who had been engaged during the first visit recalled specific elements of the conversation, and a subset reported having acted on at least one suggestion, most commonly repairing a previously leaking tap or beginning to reuse vegetable-or rice-washing water for household plants. While these outcomes are self-reported and cannot be verified independently within the scope of this study, they represent an encouraging preliminary signal that a short, targeted, conversation-based intervention — particularly one reinforced through a follow-up contact — can prompt at least incremental behavioural change, consistent with the grassroots-communication literature discussed in Section 2.3.

5.6 Segment-wise observations

Shopkeepers were generally receptive once assured that the conversation would be brief and not disruptive to their business, and several, upon follow-up, demonstrated clear recall of the specific tips discussed. Senior citizens proved to be the most engaged respondent group, often volunteering detailed historical context on how local water availability had changed over the decades, which enriched the qualitative texture of the need assessment considerably. Children displayed reasonable baseline awareness attributable to school-level environmental education, but limited application of this knowledge at home, suggesting that reinforcement through informal, personalised channels — such as this outreach activity — can add meaningful value even where formal awareness already exists.

6 Discussion

The findings of this study are broadly consistent with the behavioural water-use literature reviewed in Section 2, which suggests that awareness of water scarcity as an abstract problem is typically high even in under-resourced settings, while specific, actionable conservation knowledge remains comparatively scarce. The study area's particular context — a traditionally rural settlement experiencing rapid peri-urban transformation — adds a layer of urgency to this gap, since construction-driven demand is likely to outpace the capacity of existing informal water sources well before any large-scale infrastructural response, such as municipal network expansion, is likely to materialise.

The study's intervention design, which paired a need assessment with a tailored, conversation-based awareness delivery and a short follow-up, offers a modest but instructive demonstration of how low-cost, student- or volunteer-led outreach can be structured to maximise relevance and retention. The decision to tailor the conservation tips shared to each respondent's specific context — for instance, advising shopkeepers on equipment use and households on reuse practices — appears, on the basis of the follow-up recall observed, to have been more effective than a generic, one-size-fits-all message would likely have been, lending some field support to the segmentation principle emphasised in the grassroots-communication literature.

At the same time, the absence of any visible local awareness material in the study area points to a complementary opportunity: a single round of door-to-door conversation, however well received, is unlikely by itself to produce durable, community-wide behavioural change without some form of sustained, locally anchored reinforcement — such as permanent signage, school-based programming, or periodic repeat visits — a theme taken up further in the recommendations in Section 8.

The study's findings also carry a modest implication for real-estate developers and local planning authorities operating in the Somatane corridor. Given the scale of residential construction observed during fieldwork, even incremental household-level water savings, if achieved at scale across the new housing stock entering the market, could meaningfully offset a portion of the additional demand that such development is likely to generate — suggesting that builder-level sensitisation, discussed in Section 8, may offer a comparatively high-leverage complement to resident-level outreach.

7 Challenges and limitations of the study

- Sample size and representativeness: The purposive sample of approximately 22–25 respondents, while diverse in composition, is too small to support statistically generalisable conclusions about the broader population of the study area.
- Self-reported behavioural data: Evidence of behavioural change gathered during the follow-up visit relies on respondents' self-report and could not be independently verified through direct observation, metering, or a longer longitudinal follow-up.
- Short intervention window: The study's two-visit design, spanning approximately four weeks, captures only short-term recall and does not allow conclusions about the durability of behavioural change over a longer horizon.
- Seasonal and weather constraints: Fieldwork conducted during the monsoon season presented practical access constraints in certain areas, such as partially waterlogged approach roads in Devloli, which may have influenced the composition of respondents available at a given time.
- Language and translation: While conversations were conducted comfortably in the local vernacular, the translation of technical terms such as ‘rainwater harvesting’ or ‘greywater reuse’ into accessible language may have introduced minor variation in how precisely certain concepts were communicated across respondents.

These limitations do not undermine the study's core contribution — a documented, field-grounded account of water awareness and a replicable outreach model — but they do caution against over-generalising the specific findings beyond the study area and time frame examined.

8 Recommendations

8.1 Community-Level recommendations

- Install simple, low-cost, permanently displayed awareness material (posters, painted wall messages) at local shops and community gathering points, addressing the near-total absence of such material observed during the study.
- Encourage periodic, rather than one-off, outreach visits by student groups, local NGOs or gram panchayat volunteers, to reinforce recall and sustain behavioural change beyond the short window observed in this study.

8.2 School-Based recommendations

- Pair existing classroom teaching on water conservation with simple, structured take-home activities, enabling children to act as informal awareness carriers within their households, consistent with the child-mediated communication literature discussed in Section 2.3.

8.3 Builder and developer-level recommendations

- Given the scale of residential development observed around Somatane railway station, local builders and real-estate developers could be sensitised or incentivised to incorporate rainwater harvesting structures and water-efficient fixtures as standard practice in new residential projects, offering high-leverage, scale-level conservation gains.

8.4 Recommendations for future research

- Future studies could adopt a larger, more representative sample, ideally in partnership with the local gram panchayat, to support more generalisable conclusions.
- A longer longitudinal design, with multiple follow-up visits over six to twelve months and, where feasible, direct observation or metering of water use, would allow more rigorous assessment of the durability of behavioural change following a grassroots outreach intervention.
- Comparative studies across multiple peri-urban clusters experiencing similar real-estate-driven transformation would help establish whether the awareness-practice gap identified in this study is a broader regional pattern or specific to the Somatane–Devloli–Dahivali belt.

9 Conclusion

This study set out to assess community awareness and practice around water conservation in three peri-urban localities of Panvel taluka, Raigad district, Maharashtra, and to evaluate the preliminary effectiveness of a grassroots, conversation-based outreach intervention informed by that assessment. The findings indicate that while general awareness of water scarcity is widespread in the study area, specific, actionable knowledge of low-cost conservation techniques remains limited — a gap that a short, well-targeted and segmented awareness activity, reinforced through a follow-up visit, appears capable of addressing at least incrementally, as evidenced by the self-reported recall and behavioural response observed among a subset of respondents.

The study's contribution is modest in scale but concrete in documentation: it offers a geo-tagged, field-verified account of water awareness and practice in a specific, rapidly transforming peri-urban belt, together with a replicable outreach methodology that other student researchers, community organisations or corporate social responsibility programmes may adapt for similar settings. Given the pace of real-estate development observed in and around Somatane, the paper concludes that sustained, multi-level attention — spanning community outreach, school-based reinforcement and builder-level sensitisation — will likely be necessary to translate the area's evident willingness to conserve water into durable, scaled behavioural change.

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