

Bridging the SDG 11 Gap: Youth-Led, Data-Driven Approaches to Building Sustainable and Resilient Communities

AHEM GULATI¹, RIDHIMA GUPTA², YUVIKA GOGIA³
^{1, 2, 3}St. Mark's Sr. Sec. Public School, Meera Bagh, New Delhi, India

***Abstract-** This study examines how sustainable communities are understood and built in practice, drawing on semi-structured interviews with two youth changemakers, a supporting survey, and secondary statistics on youth civic participation. The interviews reveal a persistent gap between the language of United Nations Sustainable Development Goal 11 (SDG 11) and its implementation: cities largely react to crises rather than plan for them, political short-termism deprioritizes long-term resilience investments, and sustainability benefits such as green space and transit tend to reach higher-resource neighborhoods first. Respondents also describe formal education as under-preparing students for applied sustainability work, favoring experiential formats such as hackathons, fieldwork, and youth-led organizations instead. Statistics on youth volunteering — including participation from India's National Service Scheme, Australian youth volunteering rates, and post-disaster youth mobilization in Japan — reinforce the interview finding that young people are current contributors to community resilience, not only future ones. The paper concludes that pairing predictive, data-driven urban planning tools with genuine youth participation in design and decision-making offers a practical path toward closing the SDG 11 implementation gap.*

***Index Terms—** SDG 11, Smart City Planning, Sustainable Communities, Urban Resilience, Youth Engagement*

I. INTRODUCTION

Sustainable Development Goal 11 (SDG 11) calls for cities and human settlements that are inclusive, safe, resilient, and sustainable [5]. The stakes of this goal are largely a matter of scale: more than half the world's population already lives in urban areas, a share the United Nations projects will reach 70 percent by 2050, even as cities continue to occupy a small fraction of the Earth's land while accounting for a disproportionate share of global energy use and carbon emissions [5]. As urban populations grow and climate-related disasters become more frequent, the distance

between SDG 11's goal language and the lived experience of city residents has become an urgent practical question rather than a purely academic one. This paper reports findings from a small, exploratory qualitative study built around interviews with two youth innovators working on sustainability from different angles — one through predictive urban technology, the other through grassroots and NGO-based community work — alongside a companion survey and a set of statistics on youth civic participation.

The purpose of the study is twofold: first, to document how young people actively working in this space define sustainability and describe the barriers cities face; and second, to use their experience to evaluate whether current urban systems and education pathways are equipping the next generation to close the SDG 11 implementation gap.

II. METHODOLOGY

This exploratory study used semi-structured, written open-ended interviews conducted with two respondents identified here as Sami and Pahel Gulati. Sami is the developer of WorldTwin, a predictive urban-resilience platform, as well as MindMate and Fluenti, and has represented youth technology work in international climate competitions. Pahel Gulati has worked with community organizations including Muskaan and Beti Ek Lakshya and brings a social-work and NGO field perspective, including a Bachelor of Social Work (BSW) with a fieldwork component. Each respondent answered ten identical open-ended questions covering their definition of sustainability, the challenges cities face, the visibility of SDG 11 in practice, the alignment of urban systems with SDG 11, the role of youth, the adequacy of formal education, practical steps available to students, the role of technology, the relationship between sustainability

and inequality, and one concrete change each would make in their own city.

Findings from the interviews are supplemented with a companion survey distributed to a broader respondent pool via Google Forms, and with secondary statistics on youth civic participation gathered for a related presentation. This paper analyses the two interviews in depth; the broader survey results were not yet analysed at the time of writing and are identified below as a direction for future work. Given the small sample of two respondents, findings are best read as illustrative case perspectives rather than as generalizable claims about youth opinion at large.

III. FINDINGS

A. Defining a Sustainable Community

Both respondents independently converged on a definition broader than environmental conservation alone. Sami described sustainability as living well now without compromising outcomes for future generations, while also being able to withstand shocks such as floods and heatwaves; this respondent emphasized proactive planning, equitable access to housing and transit, and genuine resident involvement in decisions. Pahel Gulati offered a closely related definition centered on access to education, healthcare, opportunity, and safe public space, adding — based on NGO experience — that a community cannot be considered sustainable if any group is left behind. The convergence of a technologist and a social-work practitioner on an equity-inclusive definition suggests that, among youth actively working in the field, sustainability is understood as a social as much as an environmental concept.

B. Persistent Challenges in Urban Sustainability

Three challenges recurred across both interviews. First, cities were described as reactive rather than predictive: Sami pointed to underused municipal data and disaster response built after the fact rather than forecasting tools built in advance. Second, both respondents identified short political time horizons as a structural barrier, since sustainability investments pay off over decades while political incentives reward visible short-term results. Third, both respondents noted that sustainability benefits — bike lanes, green space, efficient transit, NGO attention — tend to reach

higher-resource neighbourhoods first, which Sami characterized as aesthetics rather than genuine sustainability.

C. SDG 11: Policy Language versus Practice

Asked directly whether SDG 11 goals are visible in cities or mainly in planning documents, both respondents leaned toward the latter. Sami cited the 2025 Texas floods as a case study in the absence of predictive tooling, arguing that the goal language is strong but follow-through is weak, particularly in low-income areas that continue to experience transit deserts and aging infrastructure. Pahel Gulati was somewhat more measured, noting that awareness of SDG 11 has increased and that many cities are moving in the right direction, but that implementation remains inconsistent depending on local governance capacity, resources, and public participation.

D. Alignment of Urban Systems with SDG 11

Both respondents described alignment as inconsistent and siloed. Sami noted that most cities remain built around car infrastructure, with housing zoned in ways that separate residents by income and waste management that varies by neighbourhood; cities that treat themselves as integrated data systems — smart traffic, real-time sensors, flood monitoring — were described as the exception rather than the rule. Pahel Gulati similarly noted progress in public transport and waste management but flagged housing affordability and disability accessibility as ongoing gaps, adding that individual systems that work well in isolation are rarely connected into a coherent sustainability framework.

E. Youth as Current, Not Future, Contributors

Both respondents rejected the framing of youth as merely future stakeholders. Sami, who built MindMate at age fourteen and led an international team to a global climate competition win before finishing tenth grade, argued that young people have the most at stake in these systems and are typically more comfortable with the technology sustainability now requires — provided adults create substantive roles rather than token youth panels. Pahel Gulati described how student volunteers in NGO settings mobilized communities and raised awareness directly, positioning youth as a practical bridge between residents, policymakers, and technology.

This interview finding is consistent with broader statistics on youth civic participation. In India, the National Service Scheme has engaged more than 4.25 million student volunteers in community service initiatives. In Australia, roughly 70 percent of people under 25 engage in some form of volunteering. Following the 2011 Great East Japan Earthquake, large numbers of young Japanese volunteers traveled to affected areas to distribute supplies, clear debris, and support long-term reconstruction. It is also consistent with the broader SDG literature: survey research across youth populations has found that young people already prioritize and understand the SDG framework in ways that are not yet matched by formal decision-making access [7], and commentary from SDG policy circles has warned that youth-inclusion efforts frequently stop at symbolic representation rather than substantive involvement [8] — the same dynamic Sami described as "token youth panels." Read alongside the interview data, these sources indicate that youth-led participation in community resilience is already substantial in scale — the barrier is less youth willingness than the availability of structured, decision-making roles for them to occupy.

F. Gaps in Formal Education

Both respondents judged formal education as insufficient preparation for applied sustainability work. Sami described school as teaching that climate change is real without teaching how to build tools that address it, with most practical skill gained instead through TKS, hackathons, and competitions; the recommendation offered was project-based learning tied to real community issues. Pahal Gulati made a parallel point about social-work education, noting that fieldwork — direct engagement with real social issues — taught far more than classroom theory alone.

G. Practical Steps Available to Students

When asked what students can do immediately, both respondents emphasized starting small rather than waiting for ideal conditions. Sami described building Fluenti with no budget or team, just a defined problem and a few hours, and recommended that students audit school energy use, build simple tracking tools, present data to administrators, and use hackathons as a fast way to build and connect with collaborators. Pahal Gulati offered a complementary set of low-barrier

actions — waste reduction, awareness campaigns, volunteering, and promoting sustainable practices at school — noting that small actions become powerful once many people participate.

H. Technology and Predictive Urban Planning

Sami's central technical argument was that cities need to shift from reactive to predictive planning, using digital twins, AI forecasting, and smart sensors — the design premise behind WorldTwin — but stressed that such tools must be built into planning from the outset, in direct collaboration with community members and urban planners, rather than deployed in isolation and added on afterward. This concern has independent support in the urban digital twin literature: a 2025 systematic review of 88 peer-reviewed studies found that, despite substantial technical progress since the concept emerged in 2018, urban digital twins have largely failed to deliver on their planning and decision-making ambitions because socio-technical factors — interdisciplinary integration, shared context among stakeholders, and workable adoption processes — have been left unaddressed [6]. Pahal Gulati agreed that technology can make transport, waste management, and energy monitoring more efficient, while cautioning that such tools must remain accessible so that their benefits are not limited to residents who are already well resourced.

I. Sustainability and Inequality

Both respondents agreed that sustainability efforts do not adequately address inequality by default. Sami observed that the communities most exposed to climate risk typically have the fewest resources to respond, and drew a parallel to Fluenti, where immigrant and ESL students were being left out of tools not designed with them in mind; the recommendation was to make equity a requirement of sustainability projects rather than an afterthought, with frontline communities included in design. Pahal Gulati made a similar point, arguing that sustainability discussions often emphasize environmental issues while under-weighting social inequality, and that the two should be addressed together.

J. A Local Change: Predictive Climate Intelligence

Asked what they would change about their own city, Sami proposed a real-time climate intelligence layer for the Arlington/DC area — AI forecasting and

sensors feeding a system accessible to both planners and residents, enabling neighbourhood-level flood and heat alerts with pre-identified routes and shelters. Pahel Gulati proposed a more socially oriented change: more inclusive public spaces and stronger public transportation, on the reasoning that transit connects residents to education, jobs, and healthcare while reducing environmental impact. The two proposals — one technical, one social-infrastructure — mirror the two respondents' broader framings of sustainability and illustrate that SDG 11 progress plausibly requires both kinds of investment simultaneously.

IV. DISCUSSION

Three patterns stand out across the findings. First, both respondents describe a similar failure mode for SDG 11 implementation: strong goal language, weak follow-through, and benefits that reach better-resourced neighborhoods before the neighborhoods that need them most. Second, both identify youth not as a future resource but as a present one already operating at meaningful scale, a claim corroborated by the volunteering statistics cited above. Third, both point to the same remedy from different disciplinary starting points — Sami through predictive technology built with communities rather than for them, Pahel Gulati through inclusive public infrastructure and fieldwork-based education — suggesting that technical and social approaches to SDG 11 are complementary rather than competing.

A limitation of this study is its small sample: two in-depth interviews, while rich, cannot be generalized to youth perspectives broadly, and the companion survey data would need to be analyzed in full to test whether these themes hold across a wider respondent pool. Future work should incorporate the full survey results and, where possible, interviews with municipal planners to compare youth perspectives against institutional constraints on implementation.

V. CONCLUSION

This study finds that youth working directly on sustainability issues describe SDG 11 as under-implemented relative to its stated ambitions, citing reactive planning, short political time horizons, and inequitable distribution of benefits as the primary

barriers. Both respondents position young people as current contributors to community resilience rather than future ones, a claim supported by large-scale youth volunteering statistics from India, Australia, and Japan. Formal education was described as an inadequate substitute for experiential, project-based learning. The clearest path forward to emerge from this study pairs predictive, data-driven urban planning with genuine youth and community participation in the design process — treating equity as a design requirement rather than an afterthought.

ACKNOWLEDGMENT

The authors thank Sami and Pahel Gulati for their time and candour during the interview process.

REFERENCES

- [1] Sami, personal interview, 2026.
- [2] P. Gulati, personal interview, 2026.
- [3] FRSIS Survey, Google Forms, 2026.
- [4] FRSIS Presentation, youth volunteering statistics (India National Service Scheme; Australian youth volunteering data; post-2011 Great East Japan Earthquake youth volunteer mobilization), 2026.
- [5] United Nations Department of Economic and Social Affairs, "Goal 11: Sustainable cities and communities," Sustainable Development Goals, 2025. [Online]. Available: <https://sdgs.un.org/goals/goal11>
- [6] S. Azadi, D. Kasraian, P. Nourian, et al., "What Have Urban Digital Twins Contributed to Urban Planning and Decision Making? From a Systematic Literature Review Toward a Socio-Technical Research and Development Agenda," *Smart Cities*, vol. 8, no. 1, art. 32, 2025.
- [7] "Youth Participation for Sustainable Value Creation: The Role and Prioritization of SDGs," *Sustainability*, vol. 15, no. 23, art. 16456, 2023.
- [8] "Engaging Youth in SDGs Through Representation, Inclusivity, Empowerment," *SDG Knowledge Hub*, International Institute for Sustainable Development, 2024.