Best Practices in Urban Infrastructure Planning and Management
Constructing new infrastructure

Title of the Best Practice / Research	
URBGOV (URBan GOVernance): A GIS-based Urban Governance and Planning Tool	

The Location of Best Practice Implementation	
Country	India
City	Nine cities in India
Project Website	http://urbgov.in/#!/

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| The Category Applied for	
Best Practices in Urban Infrastructure Planning and Management	

Focus Area	
Constructing new infrastructure	

Project Summary	
URBGOV (URBAN GOVERNANCE) is a GIS-based, Volunteered Information Platform that supports local & effective city planning, community based decision-making & targeted service delivery. It integrates proffered community information with city data for a spatialized & comprehensive view of the city's infrastructure, service gaps & delivery options. Using spatial capabilities of mapping software, customised algorithms & smart technology, URBGOV enables; a. multi-variate-spatial associations between scattered sectoral city data; b. synergy between parallel service delivery flows; & c. inclusion of community voices to curate innovative-local solutions - instilling empathy & accountability in the system. URBGOV is thus, an important IT Segway to community-led urban development & governance. URBGOV has been piloted in 9 cities in India, initially focused on the WATSAN sector, to achieve the Sanitation goals under the Clean India Mission.	

Project logo or Main Photo
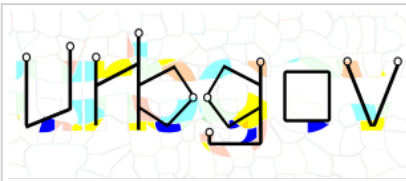
Type of submission	
Organization	

Name of the Organization	Centre for Urban and Regional Excellence
Location Of Organization	India
City/Town,Postal Code	New Delhi
Mailing Address	4, Second Floor Zamrudpur Commercial Complex, Greater Kailash, New Delhi, 110 048
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Type of Organization	Centre for Urban and Regional Excellence

Partners in Executing the Practice

Name	Organization Type	Other Organization	Address	Contact	Support Type
USAID India	International Agency		USA Embassy Panchsheel Marg, Shantipath, Chanakyapuri, New Delhi, Delhi 110021	Mr. Anand Rudra arudra@usaid.gov 9899002594	Financial Support
East Delhi Municipal Corporation	Local Authority		EDMC HQ, 419, Udyog Sadan, Patparganj Industrial Area, Patparganj, New Delhi, Delhi 110096	Mr. Pradeep Khandelwal pradeepkhandelwal100 @gmail.com 9717788004	Administrative Support
Dharamshala Municipal Corporation	Local Authority		Dharamshala Municipal corporation, District Kangra, Himachal Pradesh,176215	Mr. Devendra Jaggi dshalamc@gmail.com 9882559593	Administrative Support

Financial Profile

Annual Budget	Partner Name	Year	Contribution Amount	Support Type
10000.00	USAID	2015	10000.00	Support in Ideation
9200.00	USAID	2016	9200.00	Research and Development
8500.00	USAID and Tata Trust	2017	8500.00	Pilot of URBGOV v1.0
8200.00	USAID	2018	8200.00	Scale-up of URBGOV v1.0
33800.00	USAID	2019	33800.00	Transition to URBGOV v2.0 and v2.1

Level of Activity

City/Town

Key Dates

Date	Significance
2016-12-26	Partnership - MoU with East Delhi Municipal Corporation (EDMC) to pilot a spatial planning tool on sanitation
2017-01-27	First workshop on URBGOV v1.0, mainly focused on sanitation management, developed for EDMC.
2019-05-27	Tijara Workshop to brainstorm improvements in URBGOV v1.0 and scaling it up to URBGOV v2.0
2019-10-16	Development of URBGOV v2.0 & showcase at Asia Pacific Urban Forum 2019
2019-12-20	Upgrade to URBGOV v2.1

Scope and Criteria

The project is expected to help in developing and supporting innovative, pro-equality, efficient, reliable, sustainable and resilient infrastructure, and use of advanced alternatives evaluation.

Even as municipalities must provide basic services to all citizens, the informal poor get missed as cities lack community-level, multivariate, geo-spatial data for planning service delivery. Municipal funds are misspent, & produce less than desired impacts. Cities store data in spreadsheets & are incapable of visualizing, collating & interpreting the information for localized service delivery. Estimated losses from unplanned interventions, is between $330 billion to $1.8 trillion by 2050 (The Economic Times, Nov 29, 2016). At the household level this equals more than 20 percent of average household incomes; the gap being widest at the base of the pyramid. Community participation is vital for inclusive & sustainable development. Local governments are paternalistic. They are disinclined, & lack skills & time to engage people. URBGOV involves communities, in providing data, making the right choices & taking informed decisions on what they want. Communities validate data, adding qualitative parameters & suggest options. The process is both equalizing – both loud & soft voices get heard, & lowers the cost of service delivery by creating involvement. URBGOV is a low-cost, simple, web-based solution, using open-source software. Data for URBGOV is crowd-sourced from city engineers using geo-tagging skills on their personal smart phones – making data collection inexpensive, quick & undeniable. Google maps are used where cities have no city maps. Being part of data generation guarantees ownership. Using Smart phones smartly, is aspirational. Using open source software alleviates need for highly qualified GIS-experts in small towns where none are available. A set of pre-defined algorithms analyse, overlay & correlate diverse data layers such as when data on sanitation is crossed with health hotspots, such as during COVID 19. Once quality analysis has been derived, community-led sustainable solutions can be suggested & implemented, like rainwater harvesting & DEWATs.

The project is expected to include adoption of widely spread or commonly used infrastructure solutions to be more sustainable, cost-effective and resource-sensitive (such as behavioral change solutions), and the introduction, and support of cross-sectorial solutions.

Infrastructural provisions in poorer parts of cities are mostly below norm & shared, non-functioning, or in bad condition. Investment on infrastructure, done in the business as-usual way has two challenges; a. it excludes the opinions of informal communities, resulting in ineffective & out-of-place outcomes; & b. poor implementation & management, with cities unable to achieve even basic water & sanitation for all. URBGOV improves decision-making, streamlines workflows to make infrastructure investments useful. It also optimizes resources & cost-effectiveness. Its engagement platform is accessible to all, which helps bring in a local perspective for owned & cost effective solutions. URBGOV merges multiple data sets & simplifies bulky & unmanageable infrastructure planning for the local body. It limits data duplicity & data redundancy – thereby limiting infrastructure duplication & infrastructure redundancy at the ground level. This reduces inefficiencies in decision making & spending. URBGOV connects multiple departments & agencies dealing with discrete yet interrelated issues. It also converges spatial & non-spatial data across these agencies with community validation. By bringing these diverse data sets together, URBGOV co-creates solutions across agencies & communities, making for huge savings. Most of all, because it borrows the basic concepts of GIS & merges them with mobile-web technology in offering functional, cost-effective & sustainable solutions it is agnostic to a qualified GIS professional. In its application, URBGOV focuses on SDG goals 6 (Clean Water & Sanitation) & 11 (Sustainable Cities & Communities) & its effects cover goals 1 (No poverty), 3 (Good Health & Well-being) & 10 (Reduced inequality). Inequality is reduced both in terms of income & vulnerability. The vulnerable sections of the society like women & senior citizens positively benefit from URBGOV by being able to access infrastructural services more easily.

The project is expected to show inclusive and sustainable industrialization safeguarding industrial employment and gross domestic product.

India is urbanizing rapidly & unequally (The World Bank, 2014) with two unmistakable trends; slum growth & small town development. Slums are overcrowded, have inadequate housing & basic services, no public spaces that are essential for living healthy & productive lives, places a ceiling on potential economic growth. Bad quality water or toilets or overflowing drains, or uncollected waste, places a high disease burden on the poor & reduces their incomes or educational achievements or skill development. Small town growth is catching up, & the cities are unprepared to provide the basic infrastructure that can drive economic development & benefit from such migration. On the contrary, the pressure on the town's resources could result in over exploitation. Lack of regulation & or capacity to enforce these rules, is likely to irreparably damage the ecology of these ecosystems. URBGOV, through its streamlined investments, will affect both the general health of the informal communities & the condition of the environment positively. This will foster a more productive workforce. Time saved in accessing toilets, or drinking water, or solid waste services or transport, will foster greater opportunity for productive pursuits – & higher incomes. Better health for all, particularly, girls & women translates into greater gender equality - benefits that shall accrue over generations. It is also generally accepted that a healthier, better educated populace is more productive, earns more & creates more demand for domestic consumption, boosting the economy & general quality of life. URBGOV helps cities plan for resource generation, by involving people in say rainwater harvesting, ground water recharging, maintenance of sewer networks, or conservation of the commons. URBGOV thus builds up social capital & creates a resilient society.

The project is expected to address the fostering of multi-stakeholder collaboration through governmental incentive structures or market regulations, and the promotion of mission-driven governance, and financing models.

The new urban agenda & SDGs 11 aim to promote inclusive urbanization that Indian cities may struggle to deliver through legacy planning tools such as the Master Plans with their tokenistic engagement & ad-hoc strategies. Achieving participatory & inclusive urban development will require cities to significantly transform the way they engage, plan, build & manage cities. The primary stakeholders are the informal communities, who are the beneficiaries of infrastructural investment. These people have the maximum interest & are impacted most by the lack of public infrastructure. However, usually, these stakeholders have minimum role in the planning of urban services. URBGOV democratizes the decision-making process by including the "left behind" people & creating a platform where the formal & informal can meet & collaborate. It promotes convergence of data from various stakeholders & creates a multi-sectoral interface that can be used by various government departments. URBGOV also creates a multi-sectoral interface that can be used by various government departments. Thus, it acts as a converging platform for these multiple stakeholders. The government officials on various levels have interest in the development of urban utilities but are not directly impacted by them. URBGOV tried to bring together these two types of stakeholders: those who are impacted but with less control; & those who are less impacted but with more control over decisions. URBGOV being a transparent & accountable instrument, shall be able to attract private sector investments that shall be output & outcome based.

The project is expected to increase the motivation, and self-drive creation to lead attitude, and cultural community change, towards the required sustainable lifestyle.

Almost half the population of many Indian cities live in informal slum settlements, failure to integrate which into the citywide infrastructure planning results in gaps in service delivery & unsustainable development. This results in poor quality of life. Faulty water supply, often yielding contaminated water in the summer or monsoon, is a hotbed of disease. So is poor sanitation, which contaminates the groundwater as well. Poor waste management is a source of danger for children, who play in these waste-piles. Indeed, slum-children are often seen to be stunted, due to poor health conditions along with undernourishment. Open drains are another source of vector-borne disease & often overflow during the rainy season, bringing disease of various kind. URBGOV has enabled mapping & planning to eliminate open defecation (Ajmer, Muzaffarpur, Noida), plan for stormwater drainage (Shamli), wastewater treatment (Shamli), water-resilience in Dharamshala, waste-management in East Delhi & Dharamshala, setting-up neighborhood clinics in Delhi & toilets in North Delhi. Sustainable solutions to the gaps in infrastructure have been offered post-assessment by URBGOV—these are rainwater harvesting offered as a solution in Agra, simplified sewers, DEWATs in Shamli among others. Activities like behavior-change communication was also carried out to lower practices like open defecation & inculcate healthy lifestyles. Thus, post-URBGOV, lifestyle in the informal settlements includes sustainable resource generation, regeneration, healthier practices (reduction of open defecation in Ajmer) apart from self-leadership & people-managed infrastructural solutions. The involvement of community participants also inculcates the capacity to identify problems, increases awareness about a sustainable lifestyle & empowers the inhabitants of informal communities.

The project is expected to promote the ethical and equality pre-evaluation of leapfrog models (such as: mobility, or housing-as-a-service).

Unplanned metro cities in India have become a hotbed for congestion, poorly-performing or non-functioning services, & inferior living conditions. This is the remnant of a faulty decision-making process, ad-hoc solutions & piecemeal approach. URBGOV is an excellent equalizer that promotes healthy growth among cities of different size, geography & commerce. It offers smaller & economically weaker cities to bring themselves up to the minimum comparable standards of development to coexist harmoniously with the bigger cities & metros. Because of its ease of replicability & ease of scale with minimal effort & cost, it becomes a perfect solution for developing areas. URBGOV has already been tried & tested in East Delhi. Presently it is being implemented in eight other Indian municipalities. Since it uses personal smartphones, open source software, & eliminates the need for a city-level GIS practitioner, it can be replicated in smaller Indian cities, thus providing a systematic way to leapfrog problems in earlier-developed, larger Indian cities. After analyzing by URBGOV, cost-effective, sustainable & localized solutions have been tested out. These include school-based rainwater harvesting (Agra), decentralized wastewater treatment (Shamli), composting (East Delhi). These solutions can become prototypes for other cities to leapfrog traditional, top-heavy, grid-based solutions & move towards people-owned, people-managed low-cost solutions. Thus, it becomes possible for smaller cities to divert to a sustainable growth pattern. Ministry of Housing & Urban Finance is also examining at the model of URBGOV to see whether it can be taken up as a model practice.

The project is expected to ensure higher levels of common accessibility in least developed nation, for individuals and small businesses and industries, to more advanced infrastructure.

A developing country like India is trying for advanced infrastructure, but it is often felt that basic infrastructure needs to be developed first, which is lackingin the informal communities. These slums are a cancerous problem in Indian cities, due to poor civic governance & top-down approach. Thus, even smart cities in India focus on basic infrastructure to a large extent, or the delivery of basic infrastructure by digital or advanced means. URBGOV is an IT-enabled Segway to planned growth, which needs very little technical expertise. Such an approach which facilitates a novel, participatory & IT-based solution to the governance-related problems of basic service delivery. It is a technological innovation assisting decision makers of less developed countries to plan its services & enhance delivery & access to public utilities. The utilities can be planned & retrofitted accordingly to maximize productivity. URBGOV has enabled mapping & planning of solid waste collection systems, neighborhood clinics in Delhi, & mapping for storm-water drainage in Shamli. To these people, access to better-quality infrastructure would be an advancement in the quality of life. Post-assessment by URBGOV, some sustainable, affordable, local-based & community-managed infrastructure have been introduced. For example, rainwater harvesting in Agra, decentralized wastewater treatment system (DEWATs) in Shamli, composting in East Delhi among others. Access to these small-scale, localized infrastructure has improved the quality of life of informal settlements.

The project is expected to help in encouraging the community co-creation, co-funding, co-ownership models to increase the citizens engagement.

Although Indian cities have allocated funds for providing infrastructure to all citizens, including the impoverished in the informal settlements; in reality, they often fail to do so. There is lack of ready-to-use community level, multi variable, geo-spatial data to make suitable decisions in investing the allocated funds. Municipal funds, are therefore, often mis-allocated, & spent on beautification projects & unnecessary structures. This is because municipal decision makers lack the capacity to analyse city-level data & assess the relative importance of various options. Active participation by all stakeholders, from municipal engineers from various departments to the members of informal settlements is crucial in ensuring that these funds are properly allocated. However, local level democracy is not that strong in India; & additionally, decision-making process with proper prioritizing is not something that local councilors are adept at. Thus, Indian cities follow a top-down approach generally not including the poorest members of the city, who are left as incapacitated witnesses to the wasted municipal funds—in the form of ill-conceived beautification projects. However, as always, decisions based on the wisdom of diverse groups of people significantly lowers service delivery costs through ownership, contributions in implementation & maintenance & use of the services. URBGOV involves engagement of multiple stakeholders including citizens especially living in informal settlements. The Citizen engagement tool enables them to crowd-source & validate infrastructure-related data. In the process, citizens are made aware of their rights to infrastructure, come to know about the positive impacts of safe & hygienic basic services, & thus become active components of the engine of change. With a democratic & properly responsive government, & mobilization of large number of people made aware, positive change becomes more likely.

The project is expected to include techniques and models the ensures social diversity, shared responsibility, citizen engagement, and peaceful social mixing.

URBGOV replaces a top-down approach with a multi-stakeholder approach, ensuring the involvement of diverse groups, from slum-dwellers, women, marginal & excluded communities, to municipal engineers, health & education officials, etc. It creates a platform for citizen engagement in the data-collection & decision-making process, inculcating peaceful social mixing. In the cities where URBGOV has been implemented, CURE has tried to implement solutions which are equitable, community-led, local, maintained & operated by people with shared responsibility. An example is the rainwater harvesting (RWH) systems in Agra. RWH systems were set up in diverse settings – low caste community, schools, temples, etc. based on slum mapping. In a low-caste neighborhood where it was implemented, in times of water-scarcity, the poorer inhabitants were water-rich. It flipped the power-equations as the neighboring high-caste communities recognized & showed respect to the resource-rich poor. Similarly, after garbage disposal points were mapped in East Delhi, locations suitable for composting were identified. The neighboring community showed agency – organizing clean-ups, segregating waste at source, & reclaiming the public open spaces in their areas.

The project is expected to include methods and techniques to cater for, urban planning and development, food security requirements, smart cities and buildings needs.

Usually, the approach to urban planning in India is piece-meal, with ad-hoc implementation. Master-planning is mostly land-based & growth oriented. Cities, & decision-makers in general, lack the capacity to take into account the various layers of inter-dependencies existing in the urban ecosystem. Moreover, the same intersecting layers for the informal communities is only vaguely understood. The dynamics that the informal communities face in the various spheres of their lives, which involves navigating through resource-scarcities & poorly understood choices, is beyond the grasp of many decision makers. URBGOV is a component of smart urban planning in that it utilizes a GIS (map)-based tool to converge spatial & non-spatial data, quantitative & qualitative data. As this data is collected from the field & validated by the people, it is undeniable. URBGOV presents this data in multiple layers; so that the correlations, causalities & inter-dependencies are clearly understood from this platform. In addition, URBGOV's algorithms make decision making simple, uninfluenced & local. URBGOV has the potential to incorporate factors of food security in its spatial dimensions such as identification of spaces for urban agriculture, connecting people to food resources, mapping nutritional deficiencies by geographies such as anemia & suggesting nutrition value-added solutions. Additionally, food absorption is improved by; a. reducing the most common diseases in Indian slums; gastroenteritis, urinary tract infections; & elimination of open defecation & fecal matter & coliform contamination of soil & therefore food. URBGOV's core function is proper planning of sanitation & water sources. Increasing quality of life in this way boosts productivity & increases economic opportunities, leading to food safety. Thus URBGOV cross-cuts urban planning, health & nutrition, & general quality of life.

Narrative

Innovative, leap-frogging, and affordable technological advancement use.

URBGOV is innovative as it provides a spatial technology based platform for the presentation of informal communities-level data to the topmost decision makers in cities. Simultaneously it provides a non-grievance based channel of city-citizen communication with circular feedback loops. URBGOV technology, once developed provides a systems approach whereby small Indian towns can leapfrog the problems faced by larger ones from piecemeal planning, & pave way for sustainable development. For e.g. community-managed infrastructures implemented after URBGOV assessments like rainwater harvesting in Agra & DEWATs in Shamli town suggest these towns can use the tool to plan sustainable, affordable, local & people-managed infrastructure. URBGOV is affordable since it uses free, open-source software (FOSS) & personal smartphones for data collection. For municipalities, this works to eliminate the need for a GIS personnel. Crowd sourcing is cheap, fast & validate-able & produces effective outcomes.

Introduces a positive cultural change

URBGOV inculcates seamless inter-departmental coordination; resulting in improvement of workflows & optimized use of scarce resources by integrating data with city, changing the work-culture in municipal offices & decision-making bodies. URBGOV also creates a bridge between the informal communities & the municipal decision makers. Once they become aware of the conditions on the ground, the decision-making process becomes more inclusive & efficient. This is positive cultural change. Assessment by URBGOV has also led to community-led interventions. Rainwater harvesting in Agra in low-caste, poor communities has flipped the power-relations during water-scarcity. Interventions at the leprosy colony in Rourkela has resulted in the most vulnerable getting socially integrated into society with formal space for businesses and economic exchanges & exiting beggary. URBGOV has helped municipalities (Ajmer, Noida, Muzaffarpur) reduce open defecation. This is positive cultural change.

Positive outcomes on sustainable development at either economic, environmental and social level

URBGOV focuses on collaborative knowledge creation that promise huge cost savings for cities. On the social level, increased access to quality infrastructure, promotes social equity, especially for women, elderly, disabled, children etc. Better access to good water lowers social frictions & competitions in collection, making communities cohesive & saves health costs. Sustainable & equitable infrastructures like simple sewers networked to trunk lines in Delhi, collect & convey toilet waste to treatment plants, reducing city's health burden. Due to mapping of open-defecation areas, cities (Ajmer, Muzaffarpur, Noida) have managed to reduce it. URBGOV maps & planned investment helped East Delhi to improve performance scores in the Clean India Survey. Mapping of garbage disposal spots facilitated planning for decentralized composting, reducing organic waste transportation & methane build ups. In Dharamshala, URBGOV has been used to map traditional water sources for water-resilient planning

Favors least developed human settlements, promotes gender equality and social inclusion

URBGOV emphasizes on the informal settlements in the city. These are among the least developed settlements typically in any Indian city. Its goal is to integrate, include & ensure services equity. Planning for public toilets in slum areas where space or legality are issues, is a key component of URBGOV. Access to sanitation is an important components of gender-equality, since women need dignified, healthy & safe toilets. Mapping in Rourkela helped identify the most vulnerable settlements – people affected by leprosy. Its success led to city requests to locate 4 more areas for social integration. URBGOV has mapped schools, toilets & solid-waste management points in East Delhi, leading to better planning, development of resilient schools in blighted neighborhoods with circular economies - school-clean up, waste-segregation & composting, harvesting rainwater, micro DEWATs, & growing food. By reducing inequality, URBGOV builds up social capital for a resilient city.

Aims to Improve quality of life in either developing or developed countries/communities

URBGOV focusses on essential services - water, sanitation, health. It is very useful for small cities that are financially weak & lack technical skills. Solutions like RWH, treatment of wastewater (Shamli), elimination of open defecation (Noida, Muzaffarpur, Ajmer), decentralized composting (East Delhi), water-stream management (Dharamshala), matching neighborhood health clinics and food distribution services during COVID to slums are all aim to improve life quality. Directly, enhanced access to water & sanitation improved health, saved time, & prevented pollution of water bodies & food sources through open defecation. 1 million litres of water is collected every monsoon in Agra. Schools have water for 300 children for the year. Families are spending less on health care. Indirectly, the effect is amplified on increased school enrollment & attendance, better health for increased economic opportunities, saved time for pursuing other productive activities & better maternal & child health.

Demonstrates potential for transferability, adaptability, and replicability, including partnership models

URBGOV has been piloted in EDMC (East Delhi). It is now being replicated in NDMC (North Delhi), Agra, Noida, Shamli, Ajmer, Muzaffarpur, Rourkela & Dharamashala. Since it is a low-cost technology with a one-time investment in development of the platform it is easily replicable not just in Indian cities but also in other developing countries. It is agnostic to geographies. URBGOV is independent of highly skilled GIS professional or software, which small Indian cities cannot afford. URBGOV has the potential for a capacity-building partnership between cities. Mature cities like EDMC shall become lighthouse cities, supporting & mentoring their weaker neighbours to implemented URBGOV in peer-to-peer learning process that will also co-produce knowledge.

Improving the ecological footprint.

Aspects of URBGOV have focused on building ecological resilience. Rainwater harvesting (Agra, Rourkela) increases water resilience and involves people in resource generation, water conservation, groundwater recharging and water management. Decentralized wastewater treatment systems (DEWATs) provide a low-cost method to prevent contamination of ground & surface water and repurpose treated water for non-drinking uses. These also reduce pollution in rivers by discharging clean water into the rivers. Composting efficiently treated organic waste, reducing carbon footprint. Traditional water point mapping in Dharamshala has been used to develop plans for water-resilience that have identified points of solid waste entry into the streams. Improved waste-management, rectification of overflowing open drains—these also contribute to better environment. URBGOV is thus able to lower ecological footprint.

Personal Attachments

Document Name	Document Summary	Attachment
Organization website		External link
Organization website		External link
Organization website		External link
Organization website		External link
Main attachment	main attachment	Dubai Main Attachment 30.04_compressed.pdf

Project Attachments

Document Name	Document Summary	Attachment
Project Logo		urbgov logo.png
Project website		External link