

SMART CITY PLANNING :A CASE STUDY OF RAJASTHAN

Dr. Suman Badola

Associate Professor , Department of Geography

Seth Ranglal Kothari Government P. G. College, Rajsamand, Rajasthan

ABSTRACT

India is the second most populous country in the world, behind China, with a total population of 1.21 billion people. China is the most populated country in the world. The 2011 Census of Population and Housing in India revealed that the nation had a total resident population that was comparable to 17.31 percent of the total population of the world. The United States of America is comprised of 29 separate states and 7 different territories. It is swiftly being urbanized, and communities all throughout the country are being forced to come up with solutions to deal with the developing issue as it occurs. The immediate burden has been that of providing a higher quality of life to the urban people despite the various obstacles that include poverty, disasters, pollution, governance, the preservation of history and culture, and urban planning. This has been the case despite the fact that there are a variety of factors that contribute to these issues. Despite the fact that these problems have been afflicting metropolitan regions for a considerable amount of time, this has continued to be the case. The Prime Minister of India has set a target date of 2022 for the development of one hundred "smart cities," of which four would be situated in the state of Rajasthan. In 2011, the overall population of Rajasthan was 68.6 million, which was equivalent to 5.66% of India's total population. This idea has impacted the concept of smart cities as well as the idea of developing urban centers that would be run on technology to deliver better electricity and water supply, improved sanitation and recycling of rubbish, effective traffic and transport management systems, and so on. The technology that would power and run smart cities would allow for increased access to clean water and electricity. This article examines some of the most significant challenges that are being faced by India's rapidly expanding urban population in the context of the concept of smart cities. The concept that Information and Communication Technologies are necessary to the creation of Smart Cities is the key notion that is highlighted throughout the entirety of the article. However, prior to the adoption of such systems across India, sufficient preparation and training must first take place. This is the primary point that is emphasized throughout the entirety of the article.

Keywords: *Smart, city, Rajasthan*

INTRODUCTION

UN Habitat asserts that having an Urban Development policy in place is essential in order to offer a direction and a course of action to assist development. The policy provides an overarching framework for dealing with the significant and crucial concerns of urban services such as water, sanitation, mobility, and housing. This is accomplished through the provision of an overarching framework. The policy provides a set of recommendations for public and private initiatives and acts as a reference document for sectoral ministries and service providers. It was approved at the highest levels of government. In addition to that, it is an important reference for judicial interpretations as well as legislative institutional improvements. The policy will also

provide an opportunity for numerous stakeholders, including residents, non-governmental organizations, and participants from the corporate sector, to participate in the discourse around urban development. Historically, urban areas and towns served as important hubs for commercial activity and trade. The ports or the points where highways and rivers intersected were often where urban settlements were established. People from the countryside moved to metropolitan regions with the expectation of bettering their economic situation and their social standing there. Cities and towns offered the essential infrastructure and services to conduct trade and communication through roads, ports, and trains. Additionally, cities and towns provided chances for growth such as education, as well as services such as health and sanitation. People were drawn to the metropolitan regions due of its attractiveness. However, as cities expanded in size, the high population demand put a strain on the city's infrastructure as well as the services that it provided. The overpopulation and strain on the town's services led to the towns' gradual decline. The movement turned into a forced migration, the primary cause of which was no longer the pull effect exerted by metropolitan regions but rather the push exerted by rural areas. The cities have lost their historic role as engines of economic growth, as well as protectors of their residents' health and promoters of increased productivity. Instead of being seen as a potential chance for growth, policy makers began to view cities as a difficulty. According to the Census completed in 2011, the overall population of Rajasthan is 68.54 million people, with 17.04 million of them people living in urban areas, which accounts for 24.8 percent of the total population. There is not much of a difference between the districts in the state of Rajasthan. Only five of the state's 33 districts—Kota, Jaipur, Ajrmer, Jhodpur, and Bikaner—have an urbanization rate that is higher than the average for the country as a whole. These five important districts include Kota, Jaipur, Ajrmer, and Jhodpur. The remaining 28 districts all have a level of urbanization that is lower than the national average. There are a total of 297 urban centers in Rajasthan, with 185 statutorily recognized towns and 112 census towns. During the recent decade, from 2001 to 2011, the number of statutory towns in Rajasthan increased by just one (from 184 in 2001 to 185 in 2011), whereas the number of Census towns increased by 74. It is clear that the number of minor urban centers or urbanizing villages in Rajasthan that meet the fundamental criteria of urban is on the increase and will likely continue to do so in the foreseeable future. In the western districts of Hanumangarh, Churu, and Jaisalmer, there has been no rise in the number of census towns. This makes it quite evident that, with regard to space, the expansion of urban areas is biased toward the eastern part of Rajasthan. Overall, just around 25 percent of the state is considered to be urbanized, and in absolute terms, it may be said to be largely rural due to the fact that the state's rural population is greater than its urban population.

JAIPUR PROFILE

Additionally referred to as the "Pink City," Jaipur serves as the state capital of Rajasthan. There are 304,163 people living there, and they are dispersed throughout an area of 484,64 square kilometers. This city is a popular tourist destination, and it also features a flourishing information technology industry and an international airport. The city of Jaipur is experiencing healthy economic expansion, which makes it an attractive location for monetary investments, the acquisition of advantageous employment prospects, as well as educational and instructional pursuits. It has a rather decent and improving overall state of its infrastructure. It is striving toward the goal of preserving a healthy environment and providing its residents with adequate health facilities.

OBJECTIVE

1. To investigate and learn more about the involvement that residents played in the building of Jaipur as a smart city prior to its establishment, and 2.
2. In the process of creating a smart city, to evaluate the ideas and opinions contributed by residents.
3. To determine the role that residents are expected to play in the formulation of smart city policies.
4. To place an emphasis on the roles that residents will play in a smart city after it has been established.

LITERATURE REVIEW

The idea of a "smart city" has emerged in tandem with the expansion of existing cities. Smart computing has the potential to alleviate many of the negative aspects of city living, such as pollution, the dread of becoming a victim of crime, and feelings of social isolation [3]. Therefore, traditional cities have the potential to be turned into smart cities by utilizing the most recent technological advancements [4]. Hancke and Hancker, in an effort to assure both the city's sustainability and its efficiency, defined a smart city as one that operates in a manner that is both intelligent and sustainable [5]. According to a research by IBM [6,] the term "smart city" refers to a high-tech community that is fully equipped with all of the amenities that can improve residents' quality of life. However, in order to maintain it, we need precise information that is updated in real time so that we can develop and maintain the facilities. Both Tranos and Gertner discussed the concept of smart cities, which are characterized by unique qualities such as the presence of digital infrastructure that contributes to urban growth. It contained a plan to encourage social participation through the use of e-governance [7]. The authors Caragliu and colleagues [8] stressed the importance that ecological, social, cultural, and economic issues have in the creation of a smart city. His review post focused on highlighting the many different aspects of smart cities. According to Forrester's definition, a "smart city" is a city that designs its infrastructure and services using various forms of intelligent technology. This is something that he pointed out quite well in the context of how, over the course of the previous fifty years, people have been migrating from the countryside into the cities. This has resulted in a number of urban challenges, including congestion, pollution, inadequate waste management, and so on. In their research work, Nam and Pardo [4] addressed numerous different methods for creating an information technologically sound city. They brought attention to the fact that significant aspects of the city may be related via three primary dimensions: technological, human, and institutional. They placed a strong emphasis on the link between the administration and the people of the city in order to create an informationally sound metropolis. In his essay, Mitchell also mentioned that intelligent cities are created when software, communications networks, sensors, and identifiers are combined [9]. Lombardi outlined the primary components that make up a smart city, which he categorized as follows: smart governance, smart human capital, smart environment, and smart economics [10]. Dameri demonstrated that an approach that has been given a lot of thought is required in order to enhance the quality of life in urban areas. Technology plays an essential part in the execution of this plan [11], which will result in an improvement in quality of life and the provision of enhanced public and private services. [12] Kingston et al. state that the goal of an intelligent city is to accumulate knowledge and experience through electronic government, planning systems, and public engagement. In the article that they wrote, Mostashari and his colleagues introduced the idea of a "cognitive city." They defined it as a community in which people were able to learn and adapt to whatever changes that occurred, as well as to modify themselves [13]. During the process of establishing a smart city, inhabitants should not be left behind, according to an article on the Smart city platform. This will lead to beneficial outcomes as well as the satisfaction of the locals. In her essay [14], Emiko Jozuka says, quite well, that smart cities give a picture of the future as an ideal place where people would be in harmony with urban settings. This is the image that smart cities present. She used the technologically sophisticated towns of Masdar in Abu Dhabi

and Songdo in South Korea as examples. Both of these cities are located in South Korea. But these cities did not have any success stories because technocrats constructed them with very little input from local inhabitants. In their essay titled "Is there a role for citizens in India's smart city challenge," Tom Saunders and his co-authors [15] emphasized the fact that public engagement is one of Prime Minister Narendra Modi's five primary tools for making a smart city. The least amount of importance has been placed on this region elsewhere in the world. They have also presented a variety of elements that are important for citizen engagement and outlined ways in which citizens might be engaged in the building of smart cities. According to Menon [16] of Cisco, in order for cities to close the gap between the resources available and the needs that they have, city leaders and inhabitants must work together to come up with innovative solutions. In her essay, Kendra L. Smith [17] also noted that residents should hold municipal officials accountable for their actions and the ramifications of those actions towards the creation of smart cities to improve the quality of life for all people.

RESEARCH METHODOLOGY

Moments of reflection were interspersed throughout the research process. These reflections ultimately resulted in improvements to the study design and had an impact on the methodology approach that was developed for doing this research. Finding a path that leads to the accomplishment of a goal is the most crucial step of the work that must be done in order to accomplish any objective. A methodical approach to fixing the research issue is required if we are going to be able to draw accurate conclusions from it. The aim to have a comprehensive image of the engagement, participation, and manipulation of and by the residents in the construction of smart city Jaipur was the aspect that had the greatest amount of impact.

Hypothesis- - Citizen engagement is expected to make Jaipur a smart city. This is expected to greatly improve residents' knowledge, skills, education, and lifestyle. This study's dependent variables are smart city construction and sustainability, whereas the independent variables are people' opinions, needs, and effectiveness. We employed quantitative approaches to discuss the various topics as the major goal of this work was to explore the opinions and ideas of all inhabitants in constructing a smart city. Our research is applied because it examines citizens' roles and seeks practical responses. Social scientists use experiments, surveys, archival analyses, histories, and case studies. Our explanatory investigation sought responses from Jaipur residents of diverse cultures. We used questionnaire surveys to address the smart city question.

Results

Literature review shows review work. Review results are listed below. -

- inhabitants of cities have been aggressively encouraged to take an active role in the development and management of their communities in an effort to foster a new culture in which inhabitants are no longer seen to be only passive consumers of the services provided by their towns.
- Data is being generated in real time by the residents of the city so that city services may be managed in a more responsive manner. For instance, residents of Singapore can use the Beeline app [18] to reserve seats on buses that are operated by private companies in regions that are not serviced by public transit. Additionally, the app that was built by the team of Government Digital Services in Singapore assists operators in accurately predicting demand, which in turn allows for improvements to be made to bus timetables and routes.

- Residents in Boston use their smartphones to report potholes and other road issues [19]. This enables municipal officials to detect potholes and other concerns with roads, providing them with the ability to make more informed decisions regarding roadways.
- PetaJakarta[20] is an online open-source platform that enlists the assistance of locals in order to compile data on flooding with the purpose of assisting disaster management agencies in doing their duties in an efficient manner.
- Madrid, in collaboration with IBM, has built a platform that, in order to monitor the performance of its suppliers, collects data from the comments provided by either the inhabitants of Madrid or the vendors themselves. Because of the information provided by its residents, Boston has been able to significantly cut down on its number of gridlocks, which in turn has helped the city enhance its overall quality of life.

These are some of the models that governments all around the globe have used in order to increase citizen participation as much as possible in the construction of smart cities. A total of 3654 residents from different neighborhoods in the city of Jaipur participated in the study, and the questionnaire was sent to all of the different houses. 34% of the 3654 citizens were young people, 46% were individuals in the medium age range, 20% were people in the older age range, 64% of the citizens were male, and 36% were female.

Table 1: Citizen Participation feedback

QUESTION	YOUR OPINION				
	1	2	3	4	5
Citizen participation helps in making of a good smart city	8%	10%	28%	38%	16%
Citizens have enough opportunities in the local decision making	13%	20%	39%	23%	5%
Citizens should motivate other citizens towards smart city plan	7%	9%	17%	45%	22%
Citizen engagement, enrollment of smart volunteers	8%	12%	29%	37%	14%
Citizens are main stakeholders and beneficiaries in making of a smart city	3%	2%	5%	11%	79%
Slum visits and slum dweller interactions by the citizens	6%	35%	24%	21%	14%
Open citizen group houses for discussions	7%	14%	18%	31%	30%
Citizen group engagement in discussions with various NGOs	12%	20%	26%	30%	12%
Engaging citizens through online discussions and polling	1%	5%	14%	26%	54%

			%	%	%
Masscitizenengagementbydistributionof smartphoneswithAPPToself-helpgroups	4%	12	18	25	41
Citizengroupsengagementwithopenforumwith industryand trade	9%	20	25	31	15
Mediacampaignsonradio andTV	10	11	14	30	35
	%	%	%	%	%

*5beingmostsatisfiedand1leastsatisfied

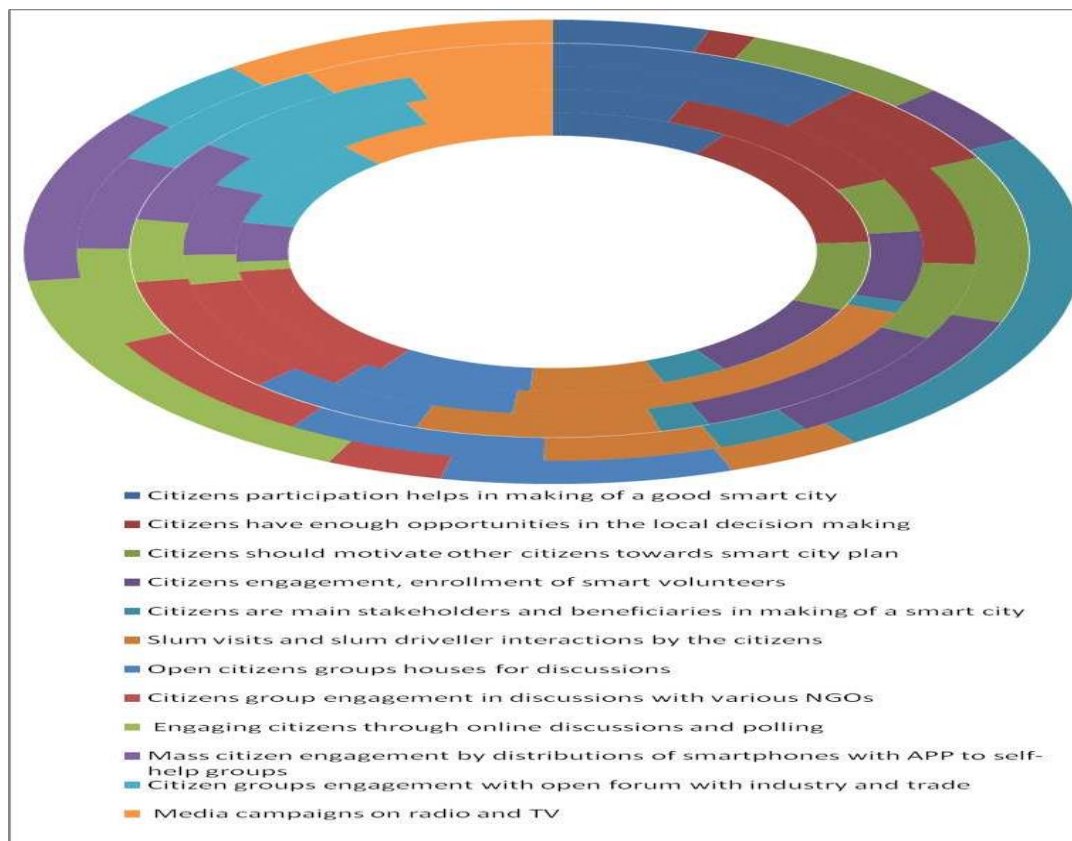


Figure1: CitizenParticipationfeedback

Inpart1ofthequestionnaire

- The majority of residents in the city of Jaipur define a "smart city" as a location that incorporates a wide range of cutting-edge technology and is known for its strong technical infrastructure.
- However, there were very few persons who defined smart cities in terms of livability, workability, and sustainability.
- Only a very small fraction of people were unaware of the smart city project.
- Nobody in fact thought that the city of Jaipur that exists now was one that was clever and imaginative.
- When asked about their thoughts on how to make their city smarter or more inventive, the majority of residents offered a variety of perspectives. These included a decent availability of public

transportation, an adequate sewage system, the availability of excellent public parks and open spaces, an environment free of pollution, and an increase in work opportunities.

In part 2 of the questionnaire,

- Residents placed a high priority on efforts to make their community more technologically advanced.
- Residents of Jaipur have voiced concerns that they do not have sufficient input into the process of making decisions at the municipal level.
- They held the belief that more inhabitants of Jaipur should also be inspired to work toward the goal of making Jaipur a smart city.
- The vast majority of Jaipur's residents gave their approval to the recruitment of intelligent volunteers.
- The majority of residents in Jaipur were of the opinion that they are the most important stakeholders and beneficiaries in the process of creating a smart city.
- The residents' reactions to slum trips and contact with those who live in slums were all over the place.
- The residents placed a high importance on having conversations with a variety of NGOs and attending open houses.
- The vast majority of residents have shown their support for including residents in the process of designing Jaipur as a smart city by holding online polls and debates.
- Residents have the expectation that the smart city project would be improved by the provision of smartphones equipped with applications to self-help groups.
- Residents are of the opinion that there should be an appropriate campaign on the smart city campaign and project broadcast on television and radio.

Table 2: General Feedback

QUESTIONS	YES	NO
Have you been asked about creating a vision for city?	18%	82%
Have you been asked for detailed solution to key pan-city issues?	27%	73%
Will the privacy of the citizens be affected because of smart city program?	28%	72%
Have you been a part of the open citizen discussion forums?	38%	62%
Do the citizens provide feedback on potholes, uncollected waste or supplier performance?	26%	74%
Have you been asked about development opportunities and issues in each core sector?	52%	48%
Have you properly understood the various smart features of the smart city?	55%	45%
Is there a focus on accident reduction?	67%	33%
Is there a better road network and connectivity?	25%	75%
Are the citizens willing to share data and provide feedback?	79%	21%
Is there sufficient availability of the local public transports?	89%	11%
Is there a control on the unauthorized water connections?	40%	60%
Is it necessary for government to promote transparency in every function of government offices to grow faith and better involvement of citizens?	84%	16%
Is there any improvement in the transport of waste?	66%	34%

Do residents use smartphones to track road defects?	28%	72%
Do you feel that maximum residents feel less engaged with smart city projects?	67%	33%
Will the smart cities be more expensive to live in?	51%	49%
Will only younger generation be able to enjoy all the benefits of a smart city?	43%	57%

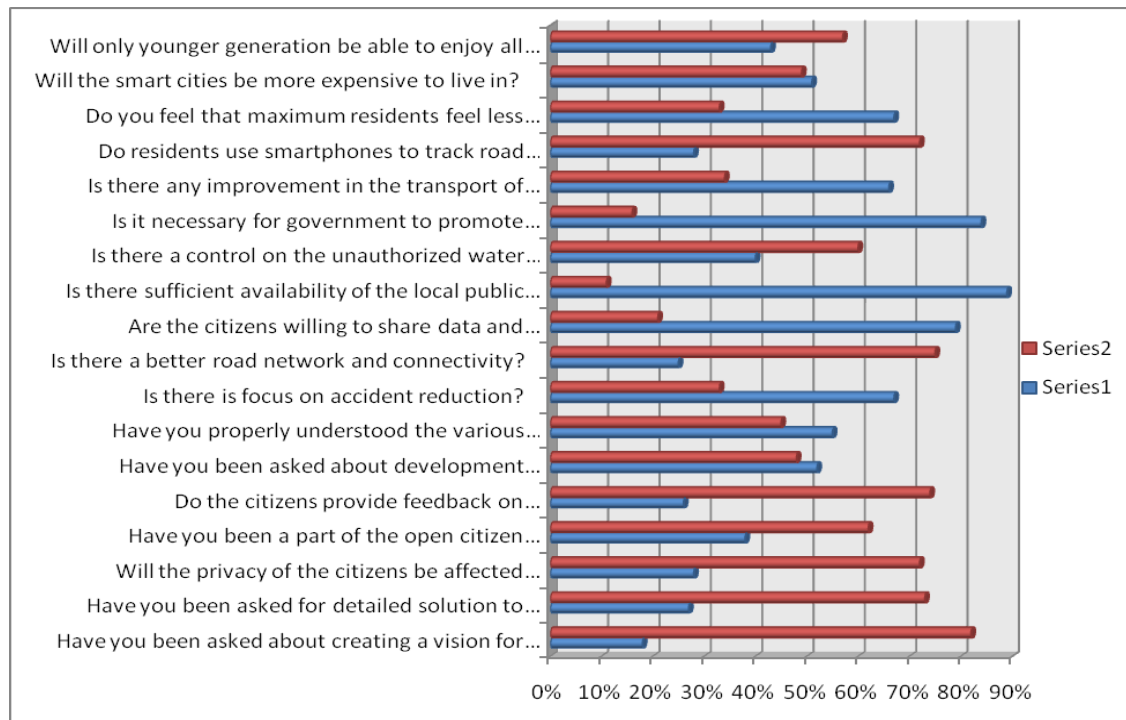


Figure 2: General Feedback

In the general feedback,

- Residents of Jaipur have reported that they have never been asked to create a vision for their city, nor have they been questioned about pen-city concerns. This is something that has never happened, according to the residents.
- It was determined by the community that the people' right to privacy will not be violated as a result of the smart city initiative.
- The majority of residents did not bother to submit any comments or suggestions on the garbage collection or potholes. Despite this, they were prepared to offer criticism as long as the necessary steps were made.
- The majority of residents believe that there is room for development in regards to fundamental conveniences such as transportation.
- The majority of residents have the impression that they are participating in the smart city initiative less.

In part 4 the smart city project,

- The vast majority of residents did not know anything about the smart city projects.
- Some people are only familiar with the term "smart city."
- Only a select few were aware of the smart city projects that were now under way.
- The vast majority of residents had an interest in learning about the issues that were relevant to their most

fundamental requirements, including pollution, health, population, water, education, and so on.

- The citizens were most aware of the projects that were being conducted to enhance waste disposal and sanitation, education and skill development, energy need fulfillment, and trash disposal; however, they were least aware of the projects that were being performed to improve these facilities as part of the process of constructing smart cities.
- Only a small fraction of respondents expressed contentment with the outcomes in these areas.
- The vast majority of residents were content with aspects of their lives such as transportation, municipal government, recreational opportunities, etc.
- The insufficient amount of publicity given to the smart city project was the primary contributor to people's lack of familiarity with it.
- It did not discuss or engage any persons in the actions that were being carried out.

Table3:Smartcityprojects

Questionofthissectionidentifywhich“smartcity”projectsarevisibletothecitizens.						
Indicate which of these general sectors relate the projects about smart city project you know of?	My city is working on following projects	I'm satisfied with the results of these areas				
		1	2	3	4	5
	Beautification of the City	12%	20%	26%	30%	12%
	Digital infrastructure & e-services	10%	19%	20%	36%	15%
	Education & skill development	40%	35%	15%	5%	5%
	Energy	30%	40%	10%	10%	10%
	Fire and emergency response	10%	12%	18%	40%	20%
	City Governance	5%	10%	15%	30%	40%
	Health	20%	20%	30%	15%	15%
	Pollution control	30%	40%	10%	15%	5%
	Quality of life	7%	10%	32%	40%	11%
	Citizens participation	8%	12%	29%	37%	14%
	Recreation	10%	10%	20%	30%	30%
	Resource management	15%	20%	40%	10%	15%

Safety	10%	40%	30%	10%	10%
Housing	20%	20%	30%	30%	30%
Water	30%	30%	20%	10%	10%
Wastedisposalandsanitation	20%	30%	30%	15%	5%
Transportation	4%	6%	10%	30%	50%
Urbanplanning	6%	14%	20%	50%	10%

Ifno...

Doyouthinkthat
yourcityisnotadequatelypublicising
itsactivities?

Istheresomeotherreasonfornotbeingawareofyour
city'sprojects?

Aboutwhichactivitiesyourcityshouldinformmore
?

*5beingmostsatisfiedand1leastatisfied

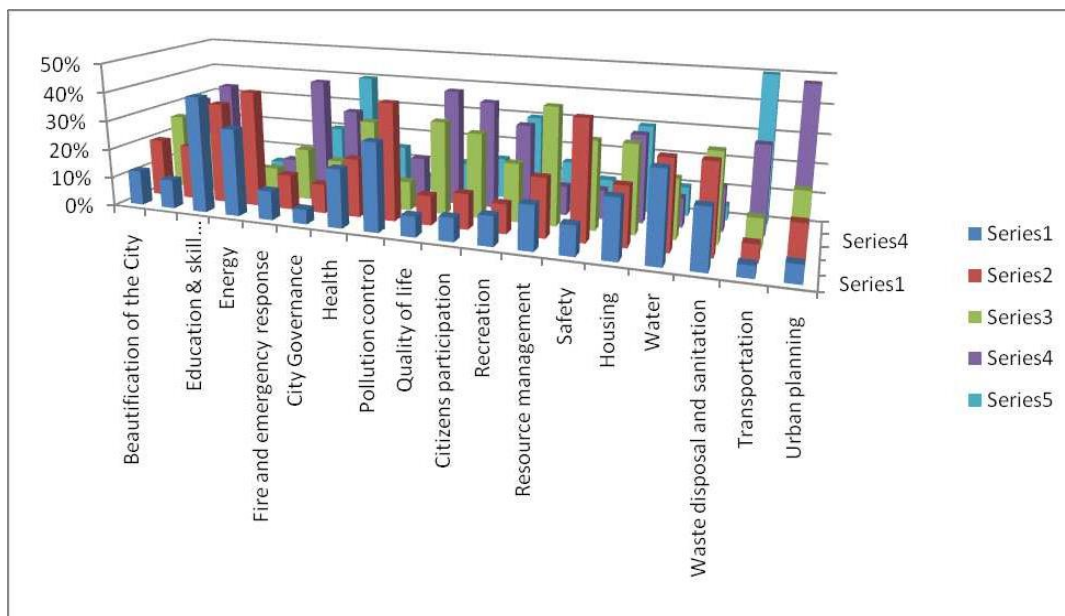


Figure3: Smartcityprojects

DISCUSSIONS

It is obvious from the examples presented in the main results that if residents are allowed to express input on smaller issues, such as potholes, uncollected rubbish, or the performance of suppliers, then they may also expect to be able to raise their voice for more significant concerns.

According to the findings of a questionnaire-based survey that was carried out in the city of Jaipur, it was discovered that the residents of Jaipur are familiar with the notion of smart cities. They are under the impression that by taking part in the event, they would be able to contribute to the improvement of Jaipur as a place to live. On the other hand, the options for citizens to participate in the making of municipal choices are quite limited.

It is necessary to build a citizen engagement model for the success of the construction of smart cities with smart inhabitants based on the inputs described above. It is not enough to provide residents with the most recent technology and open up access to data in order to fully engage them in the construction of smart cities. This indicates that in addition to software, technology, or social media, there is a need to reexamine the nature, culture, and structure of governmental institutions.

In order to encourage a better level of participation on the part of local inhabitants in smart city projects, we propose the following few points for consideration:

- It is obvious that citizens are eager to share data and offer feedback, but the success of the endeavor will depend on how successfully these data are analyzed and implemented in order to solve the problems that they face. The only way for cities to become intelligent is if someone listens to the complaints.
- It is true that technology is a strong tool that can link people, but its value will only be significant if cities can build a culture based on partnership and collaboration, i.e. changing inhabitants from passive consumers to active players in defining the city's future.
- While it is true that technology is a powerful tool that can connect residents, its value will only be relevant if cities can develop a culture based on partnership and collaboration.
- Residents of Maximum have a perception that they are engaged with smart city programs to a lesser extent than with other city services. Therefore, municipal authorities need to make an effort to incorporate residents in the city's long-term programs and financial planning. They need to go farther than apps for ways to get individuals directly involved in the political process.
- Citizens are willing to share their data with cities, but they are afraid that it will be misused, despite the fact that they are eager to offer it. Therefore, a strong governance structure is required in order to secure individuals' privacy. The participation of citizens will rise as a result.
- It is vital for the government to encourage openness in every function of government offices so that citizens would have more trust in their government and participate more actively in its affairs. As a result, it is clear that the road toward more public involvement will not be an easy one. Citizens are given the opportunity to interact with their cities through the use of digital technologies; yet, in doing so, these technologies also shake up the operation of government, compelling policymakers to tailor municipal services to meet the needs of residents and to welcome novel, creative ways. This degree of transparency may be quite dangerous for those in positions of authority. However, they need to change their mindset from one of being threatened to one of seeing that this can assist it. The rewards might be substantial for those cities that are able to adjust to the new reality. This will make cities more intelligent, more sustainable in terms of the environment, and ultimately more enticing as places to live.

CONCLUSION

As a result, we can see that the involvement of citizens must consist of more than just ceremonial participation. Intelligent individuals are required to participate in the process of defining "smart city." In order to turn Jaipur into a Smart City, they need to make the judgments necessary to acquire intelligent solutions, carry out reforms, accomplish more with less resources, and provide proper oversight throughout the creation of post-project

structures. A significant number of people in the population do not have access to the internet either because there is insufficient information technology infrastructure or because they are technologically illiterate. When services are converted to a digital format without first building the necessary infrastructure or filling in the necessary knowledge gaps, it results in the exclusion of a significant portion of the population. This also results in an increased presence of middle men and commission fees for services that were meant to be freely accessible to all inhabitants. This is a negative development for the community.

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