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A Participatory Assessment to Identify the Causes and Impacts of Open Space Reduction in Rajshahi City Corporation (RCC) Area, Bangladesh

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ABSTRACT

Open space is a vital part of city life which enhances the attractiveness of a community and provides an opportunity for recreation, playing, political activities, cultural activities, and so on. Along with enhancing the quality of life, open space can provide significant economic benefits and compatible future growth. With the increase in urbanization, the open spaces have been demolished for the purpose of residential or commercial activities. At present, these places also failed to maintain their planning standard for a community which is mentioned in private residential land development act of Bangladesh. The aim of the research is to find out the causes and the impact of open space reduction in Rajshahi City Corporation (RCC) area with the help of participatory rural appraisal techniques. The research also tries to give some suitable recommendation which helps the community, local and national authorities to preserve this open space. The preservation of these open spaces will provide more recreation places for the children, younger age, and older people which enhance their mental and physical strength. The study finds that in a gap of fewer than 10 years, RCC area lost 27 (35.64 acres) of its open space. The main reasons for the loss of these open spaces are the land acquisition by the authority for undertaken various development activities. The current alarming situation will be improved if the planning standard is followed to accommodate the present and future provision and the involvement of local communities in any decision-making for the betterment of the community.

Keywords: land acquisition, open space, participatory rural appraisal (PRA), Rajshahi City Corporation (RCC), urbanization.

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INTRODUCTION

Planning provides the opportunity to assess where you are, where you would like to go, and how you might get there [1]. Planning now to protect important open space and recreational facilities can greatly enhance the attractiveness of your community and encourage compatible growth in the future [2]. Along with enhancing quality of life, protecting open space can provide significant economic

benefits. It can help a community avoiding the costly mistakes of misusing or overwhelming available resources. Protected open space usually raises the taxable value of adjacent properties and is less costly to maintain than the infrastructure and services required by residential development [3]. Open spaces are important to urban life. These provide residents with places to socialize, relax, play, and undertake physical activity.

Open space refers to land that has been reserved for the purpose of formal and informal sport and recreation, preservation of natural environments, provision of green space, and/or urban storm water management [4]. Easy access to all the open spaces can provide accessibility to all the recreational places as well as playing equipment present in those spots [5 & 6].

From a public health perspective, suitable open spaces provide benefits for both healthy and disabled people. But when the playground has barriers and undulation, a child with a disability has lost the opportunity to play. Also, a ground surface which has undulation, children need lot more energy to play compared to a regular surface [7].

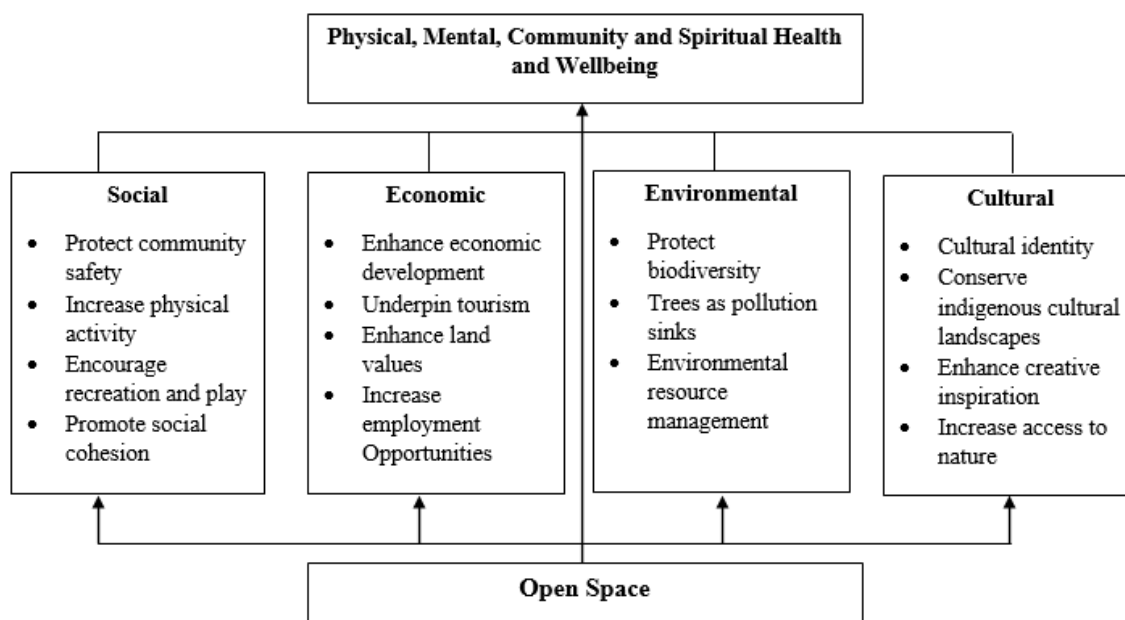


Fig. 1: How quality open spaces impact on wellbeing through social, economic, environmental and cultural factors ("Regional Public Health (2010): Healthy Open Spaces: A summary of the impact of open spaces on health and wellbeing," 2010).

Rapid urbanization and manmade activities cause reduction of the open spaces. Progressively due to loss of open spaces, pressure will be increased in the existing playground which reduces their standard. This loss of standard hampers a particular community and a whole city. Open space like a playground and recreational places can greatly enhance the attractiveness of our community and encourage compatible growth in the future [8]. Along with enhancing the quality of life, protecting open space can provide significant economic benefits. Social, economic, environmental, and cultural factors provide the pathways between quality open spaces and their impact on health and well-being. How quality open

spaces impact on well-being through these factors are discussed in Figure 1.

The application of participatory rural appraisal (PRA) tools to identify the causes and impact of open space reduction on urban health and environment is comparatively a new technique in the field of open space management, where all the causes and impacts are identified with the participation of local community people. Although PRA is a rural-area-based tool, but nowadays, this tool is rapidly used so solve the urban problems. The present study also demonstrates the decadal change of open space in the RCC area using ground truthing techniques. In addition, it also proposes the suitable

recommendations to overcome the adverse impact of open space reduction in the community. Preservation of open space contributes ecological services, foster social and personal well-being, and facilitate physical activity through active recreation.

LITERATURE REVIEW

PRA is considered as one of the popular and effective approaches to gather information in rural areas. This approach was developed in early 1990s with considerable shift in paradigm from top-down to bottom-up approach, and from blueprint to the learning process. In fact, it is a shift from extractive survey questionnaires to experience sharing by local people. PRA is based on village experiences where communities effectively manage their natural resources [9]. PRA is intended to enable local communities to conduct their own analysis and to plan and take action (Chambers R, 1992). PRA involves project staff learning together with villagers about the village. The aim of PRA is to help strengthen the capacity of villagers to plan, make decisions, and to take action toward improving their own situation. PRA is a methodology of learning rural life and their environment from the rural people. It requires researchers/field workers to act as facilitators to help local people conduct their own analysis, plan, and take action accordingly. It is based on the principle that local people are creative and capable and can do their own investigations, analysis, and planning. The basic concept of PRA is to learn from rural people. Chambers (1992) has defined PRA as an approach and method for learning about rural life and conditions from, with, and by rural people. He further stated that PRA extends into analysis, planning, and action. PRA mainly involves villagers and local officials in the process [10]. There are a wide range of participatory tools and techniques available. People can use these

tools and techniques according to their situation or needs. Generally, the application of different tools may vary from one situation to another. However, the process for conducting RRA/PRA remains the same.

According to the above studies, the study team selected some PRA tools such as pair-wise ranking, direct observation method, focus group discussion, cause-effect diagram, etc., which are very effective for this analysis. Direct observation refers to the output from the observation from PRA facilitators during PRA survey in the community and while interacting with community people. It's an important tool which helps us to find the information we need without much difficulty. The community people also help us to find the related information during the direct observation.

Pairwise ranking is a PRA method that helps community people to set priorities, i.e. problems, needs, actions, etc [9]. Ranking can be undertaken with key informants or focus group of community people that represent a good mixture of interests. It places in an order of what is more or what is less important (Development, 2010). Ranking methods allow us to see individual and group priorities among a number of alternative problems or solutions. It helps to generate reasons why people choose one item from the other [11].

Cause-effect diagram method is often utilized to address the root causes of related issues. This method is also called fishbone [9]. This method is described through a diagram which presents visually the causes, effects, and their interlinkages, which help in arriving at an in-depth understanding of a particular topic and provide scope for analysis and subsequent action by local people [9 & 10].

Focus group discussion is particularly useful to elicit information regarding social customs, problems, and behavior. Focus group usually refers to a group of usually 10 or fewer or more individuals who have an advantage of self-correcting mechanism within the group, whereby an individual who gives an overlay favorable picture of himself or herself is immediately corrected by the other groups [10 &12]. The group usually consists of volunteers or key informants gathered to discuss a particular product or idea. They are asked a series of questions or are given statements to which they freely share their opinions, ideas, and reactions [12].

METHODOLOGY

As PRA-generated data are seldom conducive to statistical analysis (given its largely qualitative nature and relatively small sample size), alternative ways have been developed to ensure the validity and reliability of the findings. These include sampling based on approximate stratification of the community by geographic location or relative wealth, and cross-checking, that is, using a number of techniques to investigate views on a single topic (including through a final community meeting to discuss the findings and correct inconsistencies) [10]. To fulfill the objectives of the study, many literature works were reviewed to understand the PRA tools and how to use the tools. Then the study area is selected by sorting out some possible goals and solid objectives. Data were mainly collected through field survey. Open space data which were developed during the Rajshahi Division Master plan in year 2008 were collected from Rajshahi Development Authority (RDA) office [13]. Field survey using PRA tools and ground truthing to validate the 2008 open space data are considered as the primary data collection process. Some selected PRA tools are used to collect and analyze the data like pairwise ranking, focus group discussion, and cause–effect

diagram. People were invited from different wards of RCC area to participate and give their opinion in focus group discussion, pairwise ranking, and cause–effect diagram. The participant profile is discussed in Table 1. The PRA facilitator tries their best to insure participants from every sectors which include general people as well as powerful people of the society. The cause–effect diagram is also a method of diagramed representation of causes, effects, and problems along with the problem. This method is also used for the analysis for better representation.

Table 1. Profile of participants in PRA survey.

Age	Amount	Gender
Less than 18 years (children)	6	4 males and 2 females
18–50 years (middle-aged people)	8	5 males and 3 females
More than 50 years (older people)	6	4 males and 2 females

Findings from pairwise ranking matrix, cause–effect diagram, and focus group discussion mobilize to give possible recommendations about the open space problems in RCC area. The main reasons for the loss of this open space are the land acquisition by the authority, water logging, changes in land-use pattern, filling up land with soil, construction debris, etc. The situation will be improved if the local communities informed and involved in any decision made for the betterment of the community. The local government should maintain the planning standards for open space to accommodate the present and future provision.

STUDY AREA PROFILE

RCC area is 95.56 km², located in between 24'20' and 24'24' north latitudes and in between 88'32' and 88'40' east longitudes. It is bounded by Paba Upazila on all sides. The population total is 388,811: 208,525 males and 180,286 females.

Rajshahi municipality was formed in 1876 and it was turned into City Corporation in 1991. Rajshahi district has four thanas, 33 wards, and 170 mahallas. The thanas are boalia, rajpara, matihar, shah makhdum [14]. The total area of the district is 2425.37 km². Rajshahi District is bounded by Naogaon District on the north, West Bengal of India, the Padma and Kushtia District on the south, Natore District on the east, and Chapainawabganj District on the west. The region consists of Barind tract, Diara and Char lands. Rajshahi town (City Corporation) stands on the bank of the river Padma. The area of the Rajshahi City Corporation is 96.72 km².

The central park, Shahid Kamaruzzaman Central Park and Zoo, is one of the popular public places of Rajshahi city. A wide area with lush green trees and grasses is also houses of different animal species [14]. It is located on the bank of River Padma containing both regular and rare species. There are other parks in the city such as Bhubon Mohon Park, Captain Monsur Ali

Park, etc. [15]. A park which is specially designed for the children's amusement, called Shahid Zia children's park, also situated near Cantonment area.

The bank of the Padma River along the city is also a very popular destination for recreation. The bank is a planned zone in many parts of the city to accommodate city dwellers for recreation purposes. As an example, Munsguard Park near magnificent Old Dutch Boro Kuthi building and Lalonshah park near Shahmukhdum Eidgah are recently built to give city people a nice place to enjoy the magnificent views of Padma River [14]. There are also two recreational and refreshment places such as Shimante Nongor and Shimante Obokash situated along with the river bank, and both are run by BGB (Border Guard Bangladesh), which are very popular now in Rajshahi. Overall, open space and recreational place conditions are good but not utilized properly in RCC area [15].

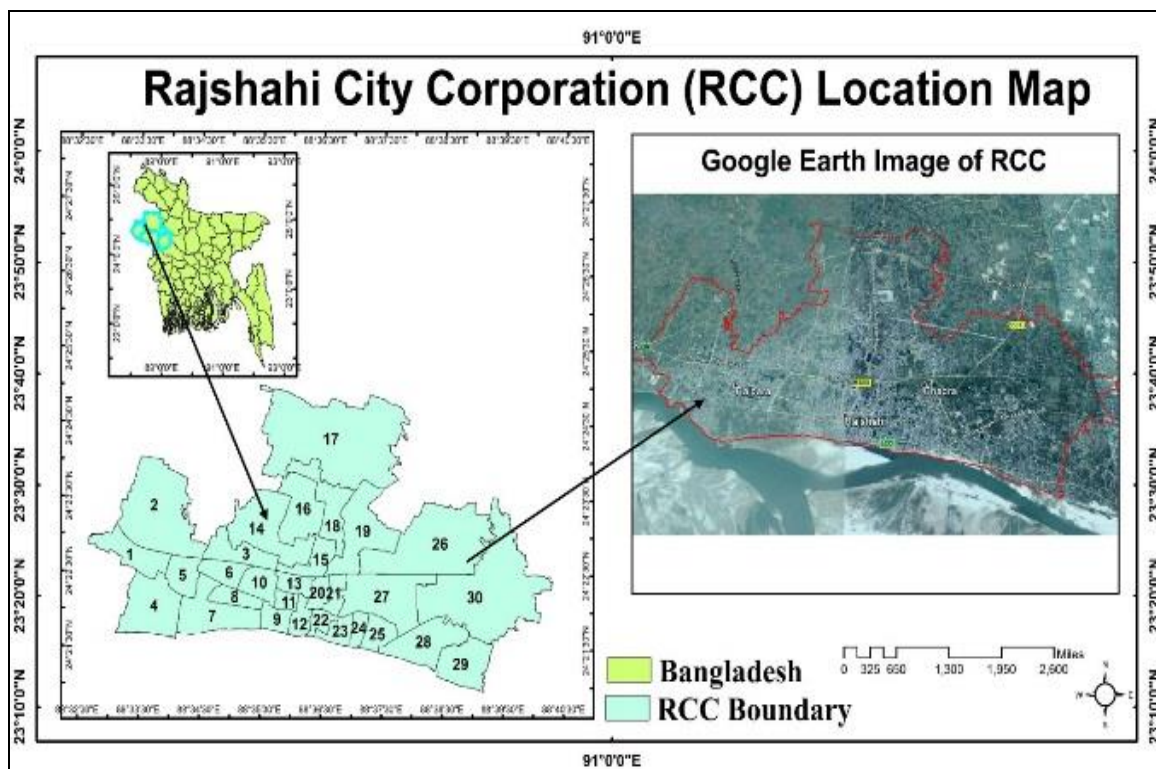


Fig. 2: Location map of study area.

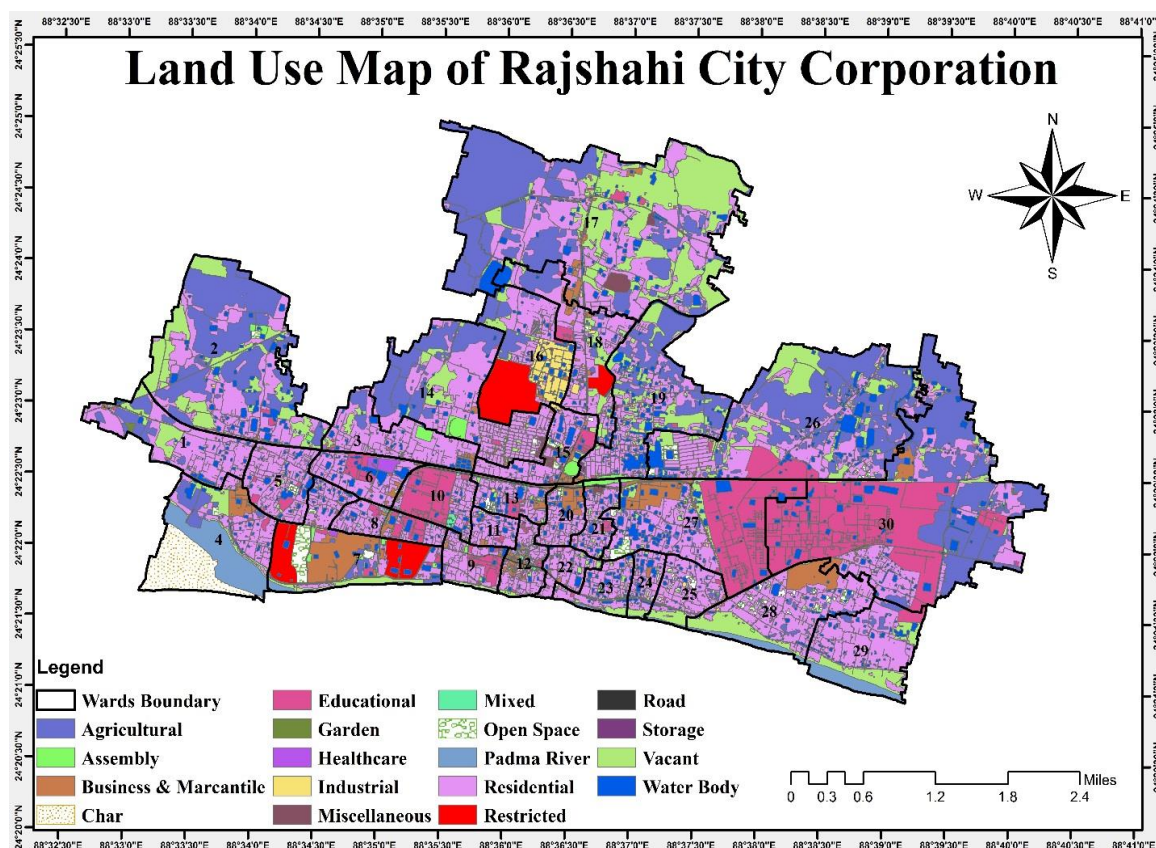


Fig. 3: Land-use map of RCC area based on updated master plan in 2008.

No study has been conducted about the open space of RCC area. Rajshahi is a fast growing city and rapid urbanization happened in this city in the last few decades. To observe the open space situation in RCC area and identify the existing situation of the open spaces in RCC area, the study area was selected on the basis of considering the rapid urbanization happened in RCC area which happened in the existing open spaces also.

RESULT AND DISCUSSION

Existing Condition of RCC Open Space

According to the information collected from Rajshahi Development Authority (RDA), the number of open spaces present in year 2008 updated master plan within the RCC area is 95 which area is 125.37 acres (Figure 3 and Table 2). But after conducting the ground truthing of those 95 places, we found only 65 open spaces where the area is 89.73 acres (Figure 4 and Table 2). In space of almost 10 years, the RCC area lost its 35.64 acres of open

space (Table 2). Open space is very vital for community people. Open space is used for recreational activities, public gathering, and children are able to play in those open spaces. For this purpose, the study tries to find out the causes and impacts of open space lost with engaging community people of RCC area.

Figure 3 represents the open space situation in RCC area in year 2008 and Figure 4 represents the existing open space situation in RCC area. Table 2 describes the amount of open spaces present in different wards of RCC area in years 2008 and 2017. From Table 2, its noticeable that maximum open spaces were present in ward numbers 28 and 26, while the reduction of open space mostly happens in ward numbers 28, 26, and 13. During the PRA survey, according to the opinion of community people, most of the open spaces have been reduced to meet the rapid urbanization or acquired by the authority for the purpose of development activities.

Awareness should be created to preserve the community open space which will be helpful for our physical and mental health

as well as ensure environmental sustainability.

Table 2. Status of open spaces in different wards of RCC area.

Ward number	Open space (2008)	Open space (2017)	Number of open space reduced
2	1	1	0
4	1	1	0
5	1	0	1
7	2	2	0
11	6	4	2
13	11	9	2
14	3	2	1
15	8	6	2
17	3	3	0
18	1	1	0
19	1	0	1
20	2	2	0
22	1	0	1
24	4	2	2
25	12	8	4
26	13	9	4
27	2	2	0
28	23	16	7
Total	95 (125.37 Acres)	68 (89.73 Acres)	27 (35.64 Acres)

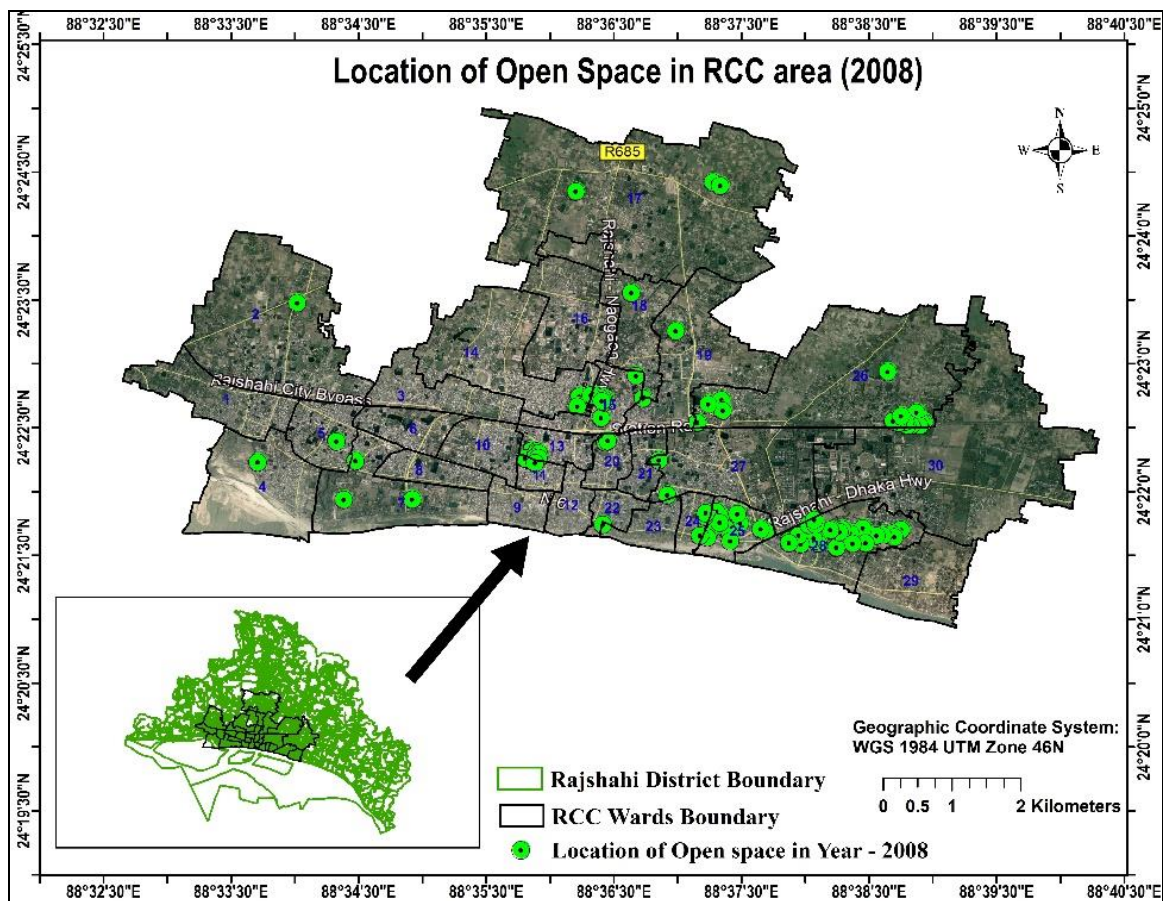


Fig. 4: Location of open spaces in RCC area, 2008.

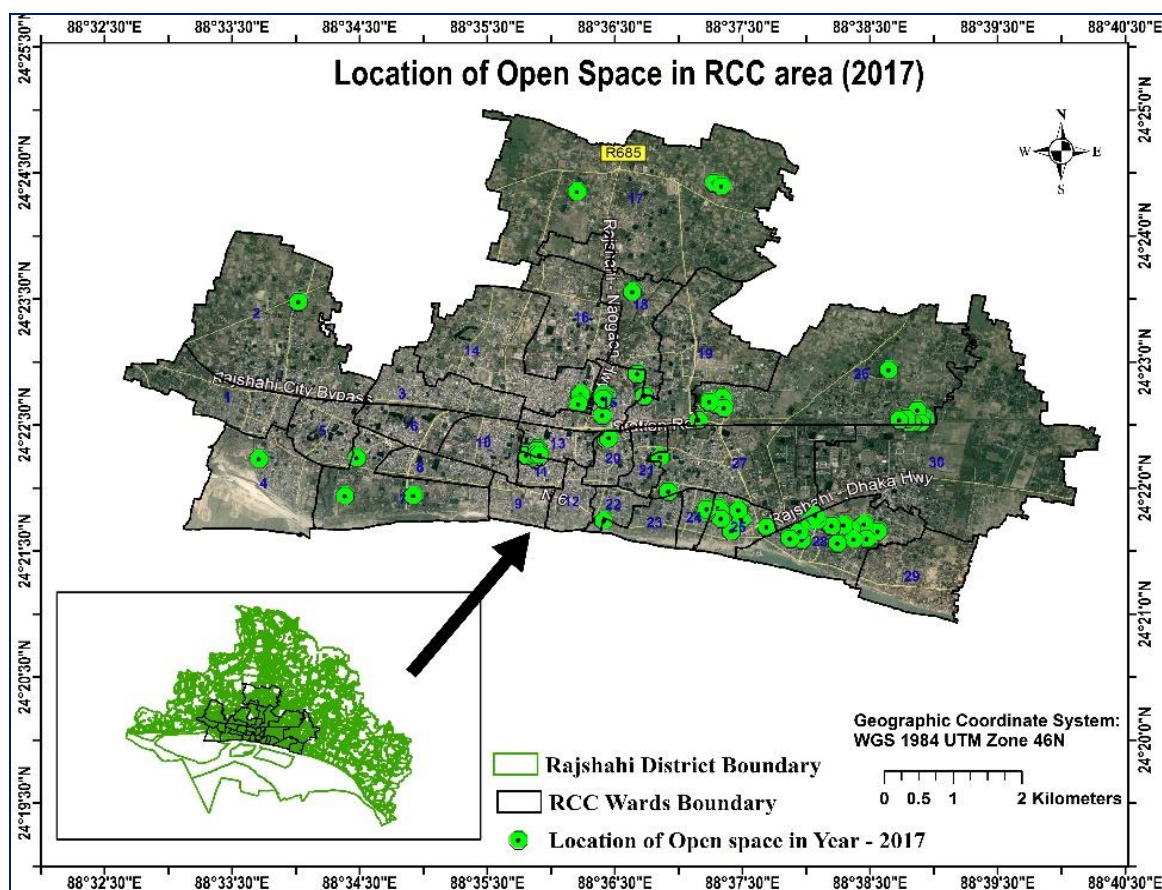


Fig. 5: Location of open spaces in RCC area after ground truthing, 2017.

Findings from Direct Observation by PRA Facilitators

While conducting through RCC area, the scenario is very much alarming in case of open spaces. There happened land-use change in maximum open spaces. Land-use change of open spaces disturbs the natural characteristics of RCC area. Water logging and land fill-up with soil create obstacles for children who come to the open space for playing. The pictures are collected during the PRA field survey (Figures 6–11). From the pictures, it's clearly noticeable that open space accessibility is affected because of construction debris, water logging, and soil fill-up. Also, the drainage condition along with open spaces is not adequate enough to pass the extra amount of rain water. It takes huge time to disappear. Water logging in the open space also reduces the accessibility of main road which affects the regular transport system of the community residents (Figures 9 and 10).

Findings from Pairwise Ranking Matrix

The causes for open space reduction which are mentioned in the Pairwise Ranking Matrix are collected with the help of public participation during the PRA survey. According to the ranking mentioned in Table 3, the main causes of open space reduction faced by the community people are construction debris, filling up land with soil, changes in land-use pattern, water logging, and land acquisition by the authority. After ranking all of the problems according to the suggestions of community people, the land acquisition by the authority for various development activities across the city in various time is the main problem faced by community people in case of open space reduction. In the second place, water logging takes place because of narrow drain as well as drain were filled up with various types of solid wastes which causes water blockage, and in return, water logging happens in some parts of the city.

Change in land-use pattern takes place in the third position which mainly occur because people do not follow the rules and regulation before constructing any residential or commercial area. In Rajshahi Master Plan, some places are reserved for open space, but during the construction of residential or commercial buildings, people do not follow the master plan, and

as a result, the open spaces are lost. Other two problems closely linked with land-use pattern are land filling with soil and construction debris, which are very much responsible to change the land-use pattern of any places in RCC area. From the pairwise ranking matrix, we clearly identify the problems why open space are demolishing gradually from RCC area.



Fig. 6: Condition of Rajshahi Satellite School open space.



Fig. 7: Construction debris in Uposhohor open space, Rajshahi.



Fig. 8: Land fill-up with soil in Upashohor Secor-2 open space in RCC area.



Fig. 9: Open space accessibility hamper because of water logging.



Fig. 10: Water logging problem in the open space of RCC area.

Source: PRA Field Survey, 2017.



Fig. 11: Land-use pattern change in the open space of RCC area.

Findings from Cause–Effect Diagram

Cause–effect diagram identifies the possible potential causes of specific problems and the further effects of the problem according to the existing condition. From Figure 6, it will be noticed

that the problems generated for reduction of open spaces which affect the air quality and fresh air reduction. Refreshment places have been reduced for all ages of people that might distract minds.

Table 3. Pairwise ranking matrix.

Problems	Construction debris (A)	Land filling with soil (B)	Water logging (C)	Land acquisition by authority (D)	Change in land-use pattern (E)	Priority frequency	Rank
Construction debris (A)		B	C	D	E	0	5
Land filling with soil (B)			C	D	E	1	4
Water logging (C)				D	C	3	2
Land acquisition by authority (D)					D	4	1
Change in land-use pattern (E)						2	3

Source: PRA Field Survey, 2017

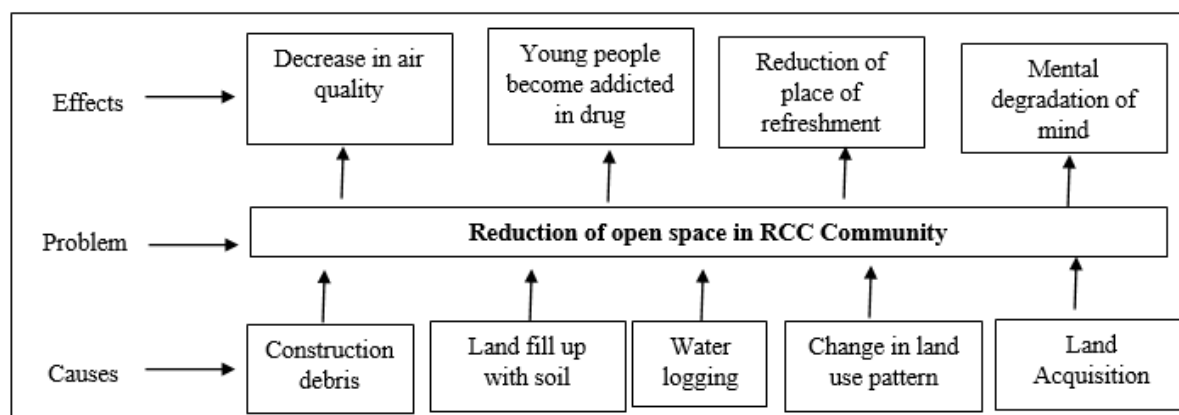


Fig. 6: Cause Effect Diagram.

Source: PRA Field Survey (2017)

Figure 6 shows the potential causes and effects of the specific problems. From the PRA data, the diagram is organized for better representation. The diagram identifies that the causes regarding open space reduction are construction debris, change in land-use pattern, water logging, and land fill-up with soil. Rapid urbanization is the main cause of this problem. Due to lack of habitation to accommodate people, more houses should be built. That’s why open spaces are used as residential or economic purposes by filling up soil in open space areas. Change

in land-use pattern creates more construction and creates obstacles and water logging in the area. This action greatly impacts on community and creates problem of reduction of open space accessibility. Open spaces are greatly needed for a community for better living condition. Due to these problems, some potential effects occur in the community. Rapid degradation of open space affects mental degradation of mind and reduction of refreshment places. As a result, children cannot play in the open spaces and people of all ages face lack of refreshment places.

This problem impacts directly in children's mind and they misguided toward addiction of drugs. This is the most serious effect of reduction of open spaces. Reduction of open space not only affects physical issues but also affects environmental stability. Decrease in air quality is also a major environmental effect due to reduction of open spaces. In addition, some socio-economic activities can be dependent on open spaces such as social interaction between community peoples, jogging place, gossiping place, portable shops to support the visitors of open spaces, etc. Cause-effect diagram is a very informative tool which helps us to identify the potential causes and effects of open space losses in RCC area.

Findings from Focus Group Discussion

During the PRA focus group discussion, the random participants include students, guardians, and others, and also political personals and powerful person in the society give their comments why their children will not able to go in the open space which has been used as playground and what are the problems they face because of the reduction of these places in their personal and also their children life. Some key quotes from focus group discussion are as follows:

- While playing cricket one of my friends gets injured by construction debris when he wants to catch the cricket ball. It was said by a focus group member named "Joy Ahmad".
- "My girl doesn't go outside because boys are playing in the open spaces rather she goes to the roof top of our building and call her other friends", said by one mother named "Mariam Bagam".
- One father named "Abdul Aziz" said that if there was a separated open space for girls, her girl will enjoy her leisure period.
- An old-aged participant named "Md. Kamruzzaman Zakir" said that he

always went out for walking after "Asor Prayer", and the walking environment in the open places were very good.

- One school teacher "Aysha Akter" said that they didn't have much playground and open space for the existing number of children to support the community. As a result, it's noticeable that some children were playing and most of them are watching the game because they don't have any space for playing.
- "Social activities are very rare in the open spaces because the places are too unorganized to use. The environment of the open spaces is unhygienic because some people utilize the open space as dumping places. Thus the open spaces could not be utilized properly" – said by a Ward councilor.
- "Open space is a suitable place for economic activities, but due to unbalanced uses of the places, it remains uneconomical", said by an engineer named "Md. Mustafizur Rahman" from RCC.

All the above points described the summary of focus group discussions that have come from direct interviews of group of peoples. The underlying fact is that the respondents are willing to utilize the open space as playgrounds for their children and also want to utilize as a social and economic place. Due to some obstructions, they could not utilize properly, but they want to. They also said that government should take care of these resources and make these more environment friendly for better living condition of the community.

RECOMMENDATIONS

Pressures on the urban environment into the future can, and are, readily predicted. Development pressures mean that open spaces need to be identified, well planned, and protected to avoid being turned into building sites or their quality

compromised. Recommendations are important to increase the evolution of research and also to provide future scope for this research with the help of the following recommendations. Recommendations also help the local and national governments to review the existing law and improve the rules, law, and regulation to improve the quality of life for the community people in future.

- The key to improving the provision of open space, sport, and recreation within the community by improving the quality of existing provision rather than increasing the quantity.
- Its need to be ensured by the local government to maintain the planning standards for open space to accommodate the present and future provisions.
- Keeping the local community informed and involved in any decision made for the betterment of the community.
- It is needed to strive for ecological open spaces that restore ecological functions and promote aquatic and terrestrial biodiversity.
- Academic, corporate, and civil society organizations may introduce and scale up gender-sensitivity training courses for boys and girls in schools and colleges, youth clubs, and neighborhood associations.
- Open space should be design friendly where individuals will get proper opportunities for their living and refreshment.
- Providing democratic access to open space so that all people, in all neighborhoods, can reap the benefits of a multi-faceted open space system.
- The drainage and existing dumping places should be improved and cleaned to overcome the problem of water logging in the area.
- Government should create integrated, connected “green infrastructure”—bikeways, green freeways, natural drainage filtration, and tree canopy cover.

CONCLUSION

Open spaces are the lungs of a city or a town. They are used by the city people in different times for different purposes. People’s lives are increasingly structured and regulated, leaving little time for the free. Also, children nowadays get less time for play. Suitable open spaces are important for spontaneous play as well as refreshment activities for all aged people which is crucial for their physical development. The research literature and analysis reveal direct links between the health and well-being of all aged people and their access to urban open spaces, and underlines the importance of all aged-friendly environments in cities. This study has demonstrated the cause and effect of urban open space loss with ensuring public participation through PRA survey. All the cause and effect demonstrations in this research are collected from public participation. Increase in urbanization and extensive development activities performed by the local and national government, the number of open spaces reduces from RCC area gradually. From the analysis, it’s noticeable that RCC area lost its 35.64 acres of its open space in less than 10 years. It’s a very alarming condition for Rajshahi city. A quality open space provided significant and sustainable impact on community health and well-being. The key to improving the provision of open space, sport, and recreation within the community appears to lie with improving the quality of existing provision of open space rather than increasing the quantity. As the population increases, these sites are likely to experience increased usage and will, therefore, over time require quality improvements. The present open space in RCC area faces quality issues like lake of drainage beside the open space which causes water logging problem in any community. Open space can be used as both social and commercial activities. Authority, urban planners, policy-makers, educational professionals, and decision-makers need to think about how to protect the urban open spaces and

should take necessary policy for making open space eco-friendlier and economical. Our hope is that the conservation of urban open spaces and improving the quality of existing urban open spaces will be mainstreamed in the policies, designs, and program to improve the current alarming situation.

REFERENCES

- [1] Wang D, Iderlina M-B, Brown G. (2013). Rethinking accessibility in planning of urban open space using an integrative theoretical framework. *6th State of Australian Cities Conference*. Sydney, Australia. 2013, November 26–29.
- [2] Kim JH. *Land Use, Spatial Structure, and Regional Economic Performance: Assessing the Economic Effects of Land Use Planning and Regulation*. University of Illinois at Urbana-Champaign; 2010.
- [3] Patrick D, Murray T. *Open Space and Recreation Planner's Workbook*. The Executive Office of Energy and Environmental Affairs, Division of Conservation Services; 2008.
- [4] *Design Principle – Parks and Open Space*. (2009). Available from www.healthyplaces.org.au.
- [5] *Accessible Playground Definitions*. 2016.
- [6] *Accessible Playground Toolkit*. Division of Outdoor Recreation, Indiana Department of Natural Resources (IDNR); 2016.
- [7] Board UA. *Playground Areas and Accessibility: Accessibility Standards for New Construction and Alterations*. Department of Justice (DOJ)/Americans with Disabilities Act (ADA); 2010.
- [8] Qutub SA, Anjum N. Urban open spaces for adolescent girls: an assessment for Islamabad and Rawalpindi, Pakistan. *The Pakistan Strategy Support Program (PSSP) Working Paper 27*. International Food Policy Research Institute; 2015.
- [9] Cavestro L. *Participatory Rural Appraisal Concepts Methodologies and Techniques*. University of Padova; 2003.
- [10] Sontheimer S, Seiffert B. *Conducting a PRA Training and Modifying PRA Tools to Your Needs*. Food and Agriculture Organization of the United Nations; 2017.
- [11] Kumar S. *Methods for Community Participation: A Complete Guide for Practitioners*. Vistaar Publications (A division of Sage Publications India Pvt Ltd); 2002.
- [12] Writing A. Advantages & disadvantages of a focus group. *Chron.com*; 2015.
- [13] Rajshahi Development Authority. Preparation of structure plan, master plan and detailed area plan for Rajshahi Metropolitan City. *Working Paper on Transport Government of the People's Republic of Bangladesh Ministry of Housing and Public Works*. 2008.
- [14] *District Statistics 2011*. Rajshahi: Bangladesh Bureau of Statistics; 2013b.
- [15] Clemett A, Amin MM, Ara S, Akan MMR. *Background Information for Rajshahi City, Bangladesh*, WASPA Asia Project Report 2 (Vol. 2). International Water Management Institute; 2006.