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Ponds Demolishment and its Root Causes: A Comparative Analysis of Two Wards in Rajshahi City Corporation, Bangladesh

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ABSTRACT

Reduction of pond area is a common phenomenon in our urban life. If the existing retention ponds are not enough to accommodate the present demand, the urban life becomes unsuitable to dwell. The water logging, degradation of biodiversity, increasing temperature and consumer's water demand arise in extensive manner. This study tries to specify the background reasons of land covering as well as the impact on urban life using sample questionnaire, field survey and master plan of Rajshahi. This study explores the future necessities of the water body conservation with respect to the growing urban population. This research work will act as a future guideline for these related studies.

Keywords: Bio-diversity, Conservation, Demolishment, Population,

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INTRODUCTION

Ponds are very important to maintain the balance in environment and biodiversity. Ponds are natural or manmade shallow water bodies which hold water permanently or temporarily [1, 2]. The size of the pond varies from 1 m² to 5 ha [3, 4]. Ponds in a city serve many purposes. It may be used as a fishing ground, recreational purposes, biodiversity, retention ponds, etc. [1, 2, 5]. Bangladesh experienced a fast increment of urban population in current age. At present, 28.4% of entire population lives in urban area. In the last five decades, a huge number of ponds are filled up due to urbanization and the annual rate of urbanization is 2.96% [3]. Bangladesh is rich in rivers, canal, ponds, bills, etc. In 2013, the total numbers of ponds in Bangladesh was 1,288,822 covering an area 150,000 ha [6]. At present, there are 41,876 ponds in Rajshahi District covering an area

of 7294 ha [4, 6]. According to Rajshahi Development Authority (RDA), in 2000, there were 729 ponds in Rajshahi city, and in 2014, the number became 214 [6]. So the number of ponds in Rajshahi city is declining day by day. Many reasons are responsible behind this reduction such as increase in population, development, encroachment, etc.

So, it is important to identify the main reason for filling up ponds in Rajshahi city and analyze whether these filling has a positive or negative impact upon people and livelihood. This study aims at the root causes behind pond demolition and analyzes the impact upon urban population.

STUDY AREA

Rajshahi is one of the major divisional city corporations in Bangladesh. It is

established in 1876. Before its establishment as city corporation, it was a municipal corporation [8, 9]. The total area of Rajshahi City Corporation is 95.56 km². Its location is in between 24°20' and 24°24' north latitudes and in between 88°32' and 88°40' east longitudes [8, 10]. It is bounded by Paba Upazila on all sides [8, 11].

For these circumstances, two wards of Rajshahi are selected. One is ward 28 that belongs to Motihar Thana, and the other ward is 20 of Boalia Thana (figure 1)

Study Area Justification

To fulfil the objectives, we have randomly selected two wards. One ward is situated in the core urban economic area and the other is outside of the main commercial area. To find out the comparative significance of land filling, we have chosen these wards. We can know the variety of impacts of the pond in the urban life by structured questionnaire and physical observation.

METHODOLOGY OF THE STUDY

The methodology of the study follows the standard steps which included setting up of objectives, literature review, data collection, data analysis and recommendations. Following is the

sequential arrangement of methodological approach adopted for the study.

Review of the Literature

Relevant literature which includes books, published and unpublished thesis, journals, reports, etc. was reviewed and analyzed. The Internet is also a major part of the literature review.

Data Collection

All necessary data for this study were collected from both primary and secondary sources.

Primary Data Collection

Primary data were collected from through field observation and questionnaire survey. The following methods were used to collect data:

Field Observation

Field situation was observed to gather first-hand experience on the present pond location. The problems and issues were identified through this process. Among 54 ponds (Master Plan, 2004), 15 ponds were filled in ward 28 (Field Survey, 2018), and among 19 ponds (Master Plan, 2004), 11 ponds exist (Field Survey, 2018) in ward 20, which means 8 ponds have been converted to buildup area.

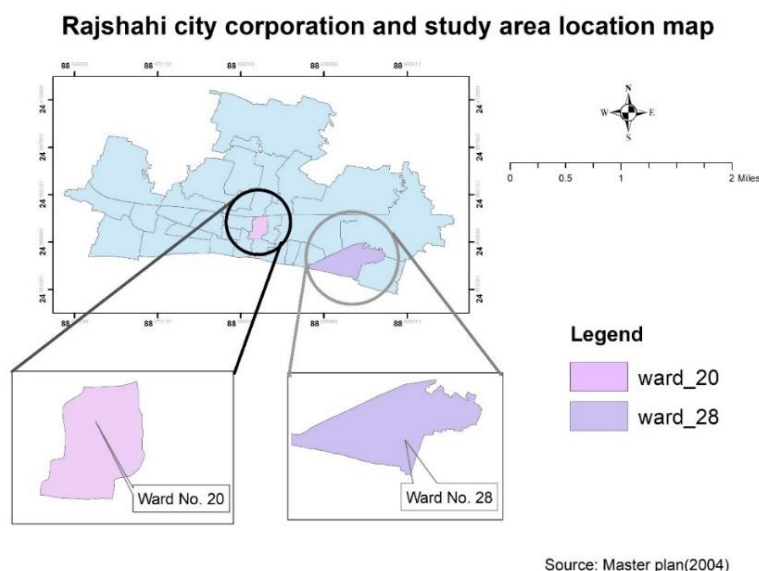


Fig. 1. Study area map.

Questionnaire Survey

A questionnaire survey was conducted based on random sampling which includes 60 respondents. The primary data were analyzed by Microsoft Excel. The total sample size was 60, which were equally distributed between the residents of wards 28 and 20.

LITERATURE REVIEW

Natural water bodies are of environmental social and economic values and perform significant functions to maintain and restore ecological balance. In addition to it, they also provide water for drinking, recharge ground areas, control floods, control city's drainage systems, and supports to biodiversity and provide livelihood to large number of people. A pond is a body of standing water, either natural or artificial that is usually smaller than a lake. Retention ponds maintain a pool of water throughout the year and hold storm water runoff following storms. Detention ponds hold water for a short period of time; this pond temporarily holds water before it enters the stream (Google, n.d.).

A study is conducted by Abdullah-Al-Kafy on "Pond filling location identification using Landsat image 8 in Comilla District". This study examines the impact of pond filling on the environment and climate change. Ponds are an important place for biodiversity. Collectively they support more species and more scarce species than any other freshwater habitat. This study results in diminishing of water bodies from 2011 to 2017. And the driving factors behind this tragedy are urbanization, land filling, encroachment business activities, etc. [4].

Another study conducted by Akhter et al. on "Pond filling and its causes in Pabna District" aimed at understanding the

phenomenon of filling up ponds in Pabna District from 1996 to 2016 and the reason behind pond filling. They also find out that urbanization, land filling and encroachment are the main causes for pond area degradation. Among them, urbanization is the major one [3].

Nowadays, pond demolition is also a common scenario in Rajshahi city. From 2002 to 2018, a huge number of water bodies are gone. Statistics shows that, in 1961, the total number of ponds in RCC were 4238, but in five decades interval of time, the ponds exist is 214. During this timeframe (1961–2010), 4000 ponds already have been lost. The result exhibits the figure of unplanned urbanization and indiscriminate earth dumping. So, observing the violent picture of pond degradation, Rajshahi City Corporation (RCC) has decided to conserve 53 natural ponds in the city to retain its surface water resources for protecting the environment from further degradation. The city corporation has adopted a Tk 206.24 crore project titled "Natural Water Bodies Conservation and Development in Rajshahi City" to attain its goal [6, 11].

ANALYSIS

According to the objectives, the analysis will contain the comparative reduction of pond area, rationality of decreasing, and impacts in the urban area. Along with these, the respondent's review will prepare the outline of the study with respect to the selected objectives.

Pond Number

In 2004, there were 54 ponds in ward 28, but in 14 years interval, 15 ponds have diminished. Most of the reduced ponds are located to the closest proximity to the road (Field Survey, 2018). There are six retention ponds in ward 28.

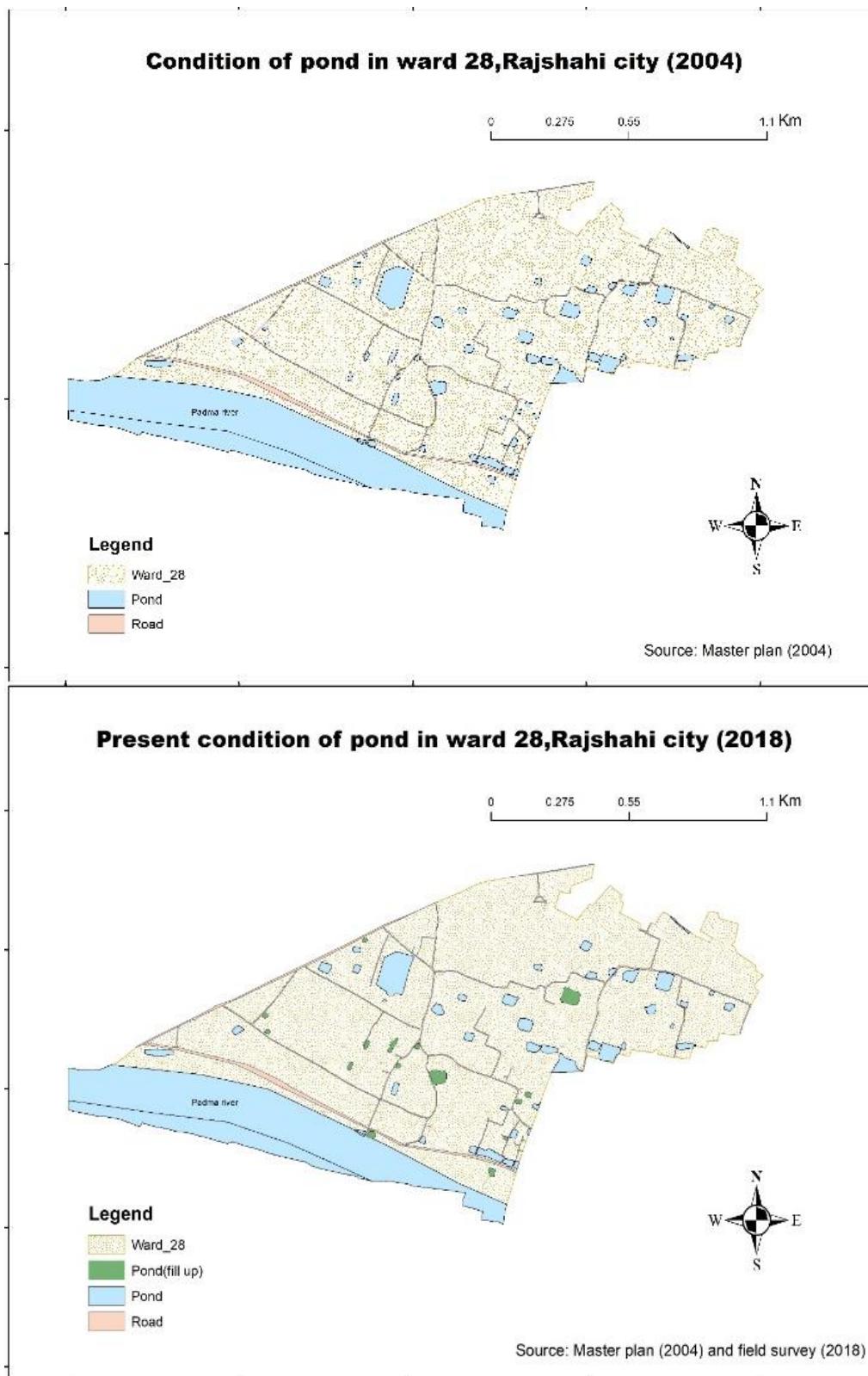


Fig. 2. Present and previous status of the pond in ward 28.

According to the field survey in ward 20, 8 ponds have been converted to buildup area where the master plan of 2004 contains 19 ponds in total. Most of the land-filling

areas are converted to a residential building. In ward 20, one pond was declared as retention pond and it is named rectangle pond.

Causes

The location of the wards contributes much to find out different reasons for filling up the pond area. The area which is away from center business district creates less tendency of covering pond area

because the concentration of building commercial and residential area is low here. The area of ward 28 is much larger than ward 20, hence the competition of pond filling is lower.

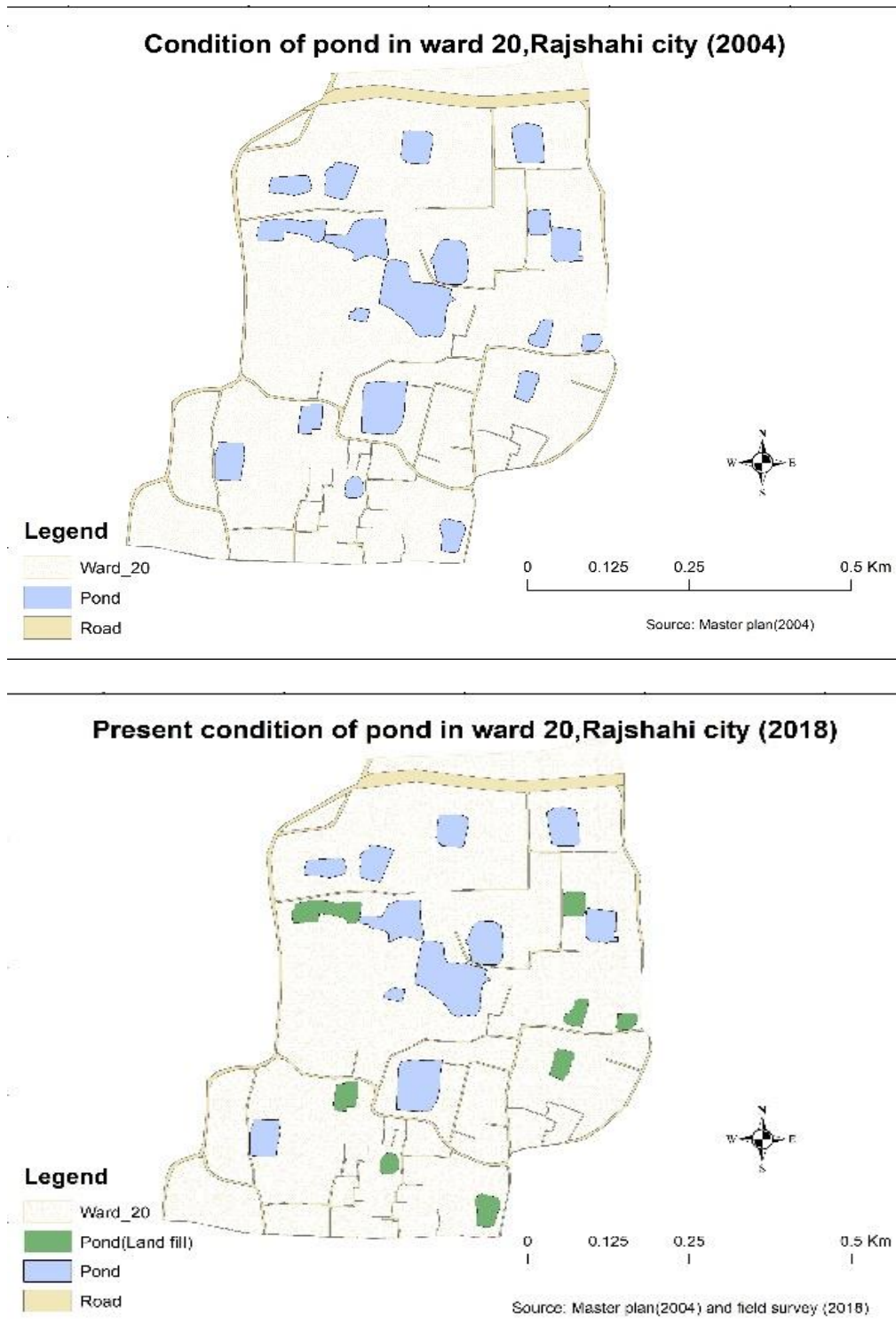


Fig. 3. Present and previous status of the pond in ward 20.

The root causes behind pond demolition are considered as urbanization, encroachment, business and political pressure. In ward 20, two executive causes are found. One is urbanization and the other is encroachment. For locational advantages, the residents are filling up their ponds to build up habitation facilities to meet the demand of accommodation nearest to the urban hub.

But in ward 28, along with urbanization, encroachment is one of the main causes for land filling. Due to lack of monitoring by the government, the land has been occupied by the local vigorous people. They have entitled the lands by their own name giving a regulated fee on a deed. These occupied ponds are called Noyon-joli. At present, the rate of urbanization has been rising alarmingly; as a result, these ponds are being filled up for more housing accommodation to cope with rising population. Shrinkage is the common problem of reducing pond area which occurred due to the unplanned dumping of garbage and cultivation of plants. In ward 20, one pond has been reduced in half of the area. But in ward 28, more than two ponds have been diminished due to shrinkage (Field Survey, 2018).

Table 1. Causes of pond filling.

Causes of pond filling	
Urbanization	75.00%
Encroachment	18.33%
Others	6.67%

According to the structured questionnaire survey, 75% respondents say that urbanization is one of the major causes for land filling, where around 18% (18.33%) believe local influence and political pressure, land gambling, etc. work as factors of encroachment, and the rest of around 7% (6.67%) believe that waste dumping, unplanned expansion and

desertification are the factors for land filling which included in others as shown in Table 1.

FINDINGS AND CONCLUSION

Consulting with people in these wards, we understand that they are not hampered actually for these purposes. Because the retention ponds existing on these areas are sufficient for providing the communities demand. But water logging and degradation of biodiversity are a common phenomenon of these land-filling activities.

At present, the areas of Rajshahi City Corporation is capable to accommodate the demand of habitation, but in future, the impact of urbanization will exceed the capability. Then these retention ponds will not remain sufficient for the adverse environment. To meet the future demand with the context of urbanization considering preservation and giving enforcement in monitoring shrinkage of the water bodies, the concerning authorities need to emphasize on policy framework.

REFERENCES

- [1] Céréghino R, Biggs J, Oertli B, Declerck S. The ecology of European ponds: defining the characteristics of a neglected freshwater habitat. In: *Pond Conservation in Europe*. Springer; 2007. pp. 1–6.
- [2] Oertli B, Biggs J, Céréghino R, Grillas P, Joly P, Lachavanne JB. Conservation and monitoring of pond biodiversity: introduction. *Aquatic Conserv Marine Freshw Ecosyst*. 2005; 15(6): 535–540p.
- [3] Akhtar MR, Kafy A-A, Paul A, Hossen ML, Ali MY, Rabbi MF, Parveen N, Oakkas MA, Hossain A, Javed A, Al-Agad MA, Rahman A, Sheema MK, Sarker SM, Anower, M. Pond filling and its causes in pabna district in Bangladesh. *J Environ Sci Toxicol Food Technol*. 2015; 11(2): 70–75p.

- [4] Kafy A-A, Ferdous L. Pond filling location identification using Landsat image 8 in Comilla district. Paper presented at the *1st National Conference on Water Resources Engineering (NCWRE 2018)*, CUET, Chittagong, Bangladesh. 2018.
- [5] Oertli B, Céréghino R, Hull A, Miracle R. Pond conservation: from science to practice. In: *Pond Conservation in Europe*. Springer; 2009. pp. 157–165.
- [6] M. Bari and I. Sarkar, "Quality Assessment of Pond Water in Rajshahi City," in *Conference Paper (PDF Available) Conference: International Conference on Planning, Architecture and Civil Engineering (ICPACE-2017), At Rajshahi University of Engineering & Technology, Rajshahi, Bangladesh*, 2017.
- [7] Rajshahi Development Authority. Preparation of structure plan, master plan and detailed area plan for Rajshahi Metropolitan City, *Working Paper on Transport*. 2003.
- [8] Clemett A, Amin MM, Ara S, Akan MMR. Background Information for Rajshahi City, Bangladesh, *WASPA Asia Project Report 2 (Vol. 2)*. WASPA Asia; 2006.
- [9] *District Statistics 2011, Rajshahi*. Statistics and Informatics Division, Ministry of Planning, Bangladesh Bureau of Statistics; 2013.
- [10] Faridatul I, Jahan S. People's perception regarding the development of community facilities: a case study of Rajshahi City Corporation. *J Bangladesh Inst Planners*. 2014; 7: 1–16p.
- [11] Asif MI, Kafy A-A, Sarker D, Al-Fatin SA, Hasan MM. Efficient utilization of urban fringe area for smart urban growth with proposed compact township design: a case study in Pabna District, Bangladesh. *Urban Stud Pub Admin*. 2018; 1(2): 150p.
- [12] Wikipedia. (2018). Rajshahi. Available from <https://en.wikipedia.org/wiki/Rajshahi> [Accessed on 14 March 2018].