

# ECOTOURISM PROMOTION IN THE WASTE WATER TREATMENT PLANT BIRATNGAR MUNICIPALITY 14 (JATUWA)

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## ABSTRACT

The study was carried out to investigate the feasibility of ecotourism activities such as bird watching, boating, walk trials, and peace park promotion in the waste water treatment plant of Biratnagar 14 (Jatuwa). For this study, the capture of birds, direct observation and questionnaires with visitors, walkers, and plant administration were used. Within a year, 27 different bird species were recorded in the plant. Hundred visitors and walkers participated in the questionnaire study. According to 90% of visitors, the Plant facility is suitable for boating, bird watching, a walking path route, and a peace park; however, 8% were unaware of these environmental services, and the remaining 2% were dubious. Only 27% agreed on the picnic park, while the remaining 73% disagreed. The administration of the waste water treatment plant had already introduced the plastic boat for internal enjoyment. The administration agreed to these environmental services if the Biratnagar executive approved them, however they disagreed on the picnic park. The study discovered that the 27 bird species recorded provide a good opportunity for bird watching. The southern three ponds are suitable for boating and can accommodate six medium-sized boats. Similarly, the 1.5 km road enables for walking trail, as does the 2 hectore plantation for Peace Park. Biratnagar Municipality has the opportunity to generate additional revenue by fostering ecotourism in the plant.

**Key word:** Waste water treatment plant, Ecotourism, Feasibility, Bird watching, Boating and Peace Park

## Introduction

The term 'ecotourism' is defined as traveling to relatively undisturbed or uncontaminated natural areas with specific objectives such as studying, admiring and enjoying the scenery with its flora and fauna, as well as any existing cultural manifestations (both past and present) found in these areas (Lascurain, 1987). Biratnagar is a metropolitan city in Nepal, which serves as the capital of Koshi Province (The Himalayan times, 2108) (The Kathmandu post, 2018) (DD News, 2018) with a population of 242,548 (CBS, 2012). It is the largest city in the province and also the headquarters of Morang district (Biratnagar mahanagarpalika, 2017). As per the

preliminary report of 2021 Nepal census, Biratnagar has an estimated city population of 244,750.

Biratnagar was declared a metropolitan city on 22 May 2017 (The Kathmandu post, 2017) a merger with additional wards pushing the total population to over 240, 000 (My Republica, 2017). It is the sixth most populous city of Nepal after Kathmandu, Pokhara, Bharatpur, Lalitpur and Birgunj, with 244,750 inhabitants living in 45,204 households (Nepal census, 2021). It is the most densely populated city among all cities out of the Kathmandu Valley.

A waste water treatment plant covering 10 hectares is located in Morang District's Biratnagar municipality 14. This plant was built with the assistance of foreign countries with the goal of scientifically managing the waste coming out of the garbage of people living in Biratnagar city in order to keep the environment clean and safe, as well as to prepare fertilizer from the sewage and provide it to farmers at a reasonable price. The facility was handed over to the Biratnagar municipality in 2019 after completion of construction.

Plants were planted on 2.5 hectares of land on the south side of the sewage treatment facility in 2018 by joint effort of the Division Forest Office, Morang and Biratnagar Municipality. Prior to 2018, the area was used as agricultural land, and after planting the plants, greenery grew and the arrival of various birds has been experienced. The purpose of this research is to look at the possibility of nature-based tourism at the Biratnagar waste water treatment plant.

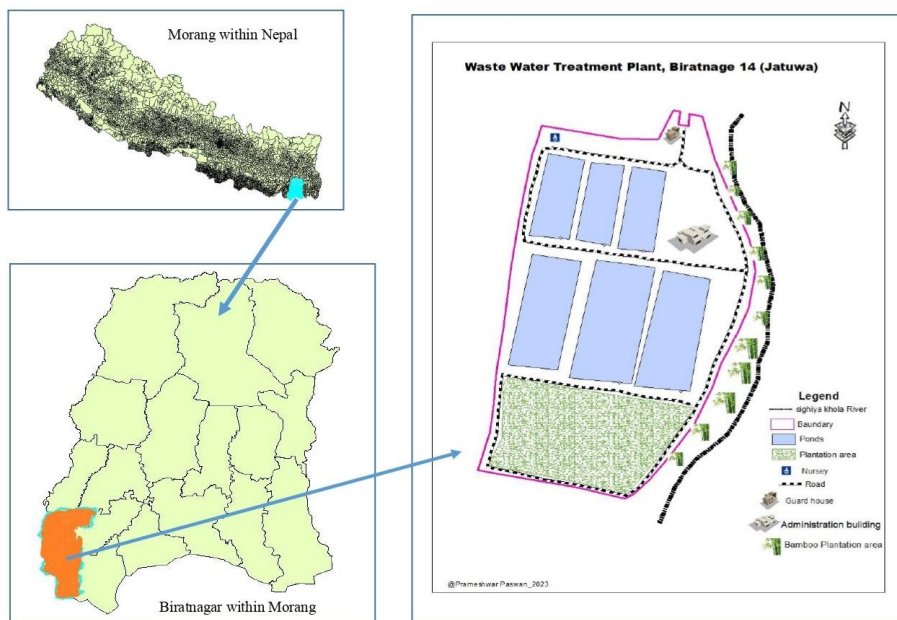
The city has zero percent forest cover, but tree plantations on private land are helping to keep the city green. Statistics reveal that the number of people travelling to this city is increasing. There are no facilities for nature-based tourism in the city. People have been visiting the community forest for nature-based tourist activities such as bird watching, nature walks, and boating, which are located 25 kilometers to the north. To manage the morning walk of city people, recreational as well as educational aim of bird watching, and to give onsite tranquil yoga and discussion meeting, the discovery of site is very important for nature oriented activities. As a result, this study, "Potential of Ecotourism Promotion in Waste Water Treatment Plant Biratnagar," is being carried out. Biratnagar municipality's income generation option will be added by promoting ecotourism.

## **Methodology of Research**

### **Study area**

The research was carried out at the Biratnagar Waste Water Treatment Plant, which is located in Biratnagar 14 (Jatuwa). The plant covers an area of 10 hectors. There are six ponds covering three hectors, and a 1.5-kilometer road is constructed within the plant. Facilitators include an administration building with a lab, a well for water treatment, and a security house. Two hectares of land on the northern side are planted with teak and eucalyptus trees, and a border plantation with Asoka trees is also underway (Map:

1). The Sighiya River flows along the eastern side of the plant, where bamboo plantations have been planted between the wall and the river.



Map 1: Map of study area

The plant is located on the city's southern side. The plant is linked to the city center by the black pitches road.

### Data collection

The direct capturing of birds by camera is employed for the potential of a bird watching hub. The birds were photographed between 5 and 9 a.m. in the morning and 6-7 p.m. in the evening from February 2022 to February 2023. On the basis of physical structures, the best location for bird watching was also found.

The direct measurement of the road developed within the Plant and asking one hundred visitors and walker around the facility was used to determine the potential of a walk trail.

The direct monitoring of planting area within plant and asking with one hundred visitors and administration bodies of plants was used for the possibility of peace and Picnic Park.

Direct surveillance of ponds and questioning of one hundred visitors and administrative bodies were used to assess the possibilities for boating in ponds.

## **Data Analysis**

The analytical statement presented highlights the important elements considered while evaluating visitor reactions and evaluating the acceptability of various parts within the facility.

First, the percentage of visitors' comments is analyzed, reflecting the amount of agreement, disagreement, unawareness, and doubt among visitors considering various environmental services and the picnic park. This quantitative depiction of visitors' comments provides significant insights into their preferences and degrees of satisfaction.

In addition to the replies of the visitors, the analysis includes quantitative data about the collected birds. This information highlights the facility's richness and abundance of bird species, stressing its importance as a bird-watching location. It helps to establish the diversity and attraction of the plant's avian environment by statistically representing the caught bird kinds.

The analysis also considers boating, walking trails, and the peace park. The pond area is assessed, emphasizing its size and importance as a suitable site for boating activities. This information implies that the pond area has plenty of space for boating enthusiasts to enjoy their recreational activities.

Similarly, the lengths of the roads within the site are considered, particularly for the walking route. By recognizing the length of the road, it suggests the possibility for visitors to engage in a fulfilling and longer walk along a recognized path. This element enhances the site's appeal as a location for people looking for outdoor exercise and leisurely walks.

The research also recognizes the two-hectare plantation area within the facility. This location is being assessed for its appropriateness as a serene setting for activities such as yoga and as a designated peace park. The vastness of the plantation land suggests that there is enough of space for people to practice yoga or find peace among the foliage.

Furthermore, the administration's recommendations have been taken into the analysis. These ideas are presumably the result of the facility's management's knowledge and insights, showcasing their understanding of the visitors' encourages and desires. By taking into account these recommendations, it exhibits a holistic approach to evaluating the overall suitability and prospective changes inside the facility.

## **Result**

People have been observed walking around the plant in the morning and evening. Some of them approach to enter in the plant, but the administration forbids outsiders from entering. Over the course of a year, a hundred visitors and morning walkers were polled

about the suitability of the plant's boating, bird watching, walk trail, peace, and picnic park (Table :1).

**Table 1: Public Opinion on Environmental Services and Picnic Park at a Facility.**

S.N.	Environmental Services	Percentage Agreement	Percentage Disagreement	Percentage Unaware	Percentage Uncertain
1	Boating	90%	-	8%	2%
2	Bird Viewing	90%	-	8%	2%
3	Walk Trail Route	90%	-	8%	2%
4	Peace Park	90%	-	8%	2%
5	Picnic Park	27%	73%	-	-

The table above shows the percentage of visitors who responded positively to various environmental services and the picnic park at a certain venue. These responses provide information about the visitors' attitudes and degrees of awareness.

90% of visitors believed that boats, bird watching, a walk trail, and a peace park were appropriate. This reflects a significant preference for these activities and amenities. It implies that the facility is great for boating enthusiasts, bird watchers, and those looking for a peaceful area for walks and leisure. These good responses may be ascribed to elements such as the presence of a pond, sufficient road lengths for walking trails, enough of room for bird watching, and a designated peace park area.

However, it is important noting that 8% of tourists were unaware of these environmental benefits. This suggests that more communication and promotion of these items may be required to increase awareness among potential visitors. Furthermore, a tiny fraction of 2% expressed doubt, implying that more explanation or information about these services could be desirable. Turning to the picnic park, the responses revealed a contrasting opinion. Only 27% of the visitors agreed that the picnic park was suitable, while a significant majority of 73% disagreed. This indicates a relatively low level of satisfaction or preference for the picnic park area. It could imply that the amenities, layout, or overall appeal of the picnic park might not meet the expectations or preferences of the visitors.

Over the course of a year, a remarkable total of 27 distinct bird species were taken within the plant area, as shown in Annex 1. This highlights the diverse avian species that occurs within the plant's surrounds, highlighting its potential as a prime spot for bird viewing and photography aficionados.

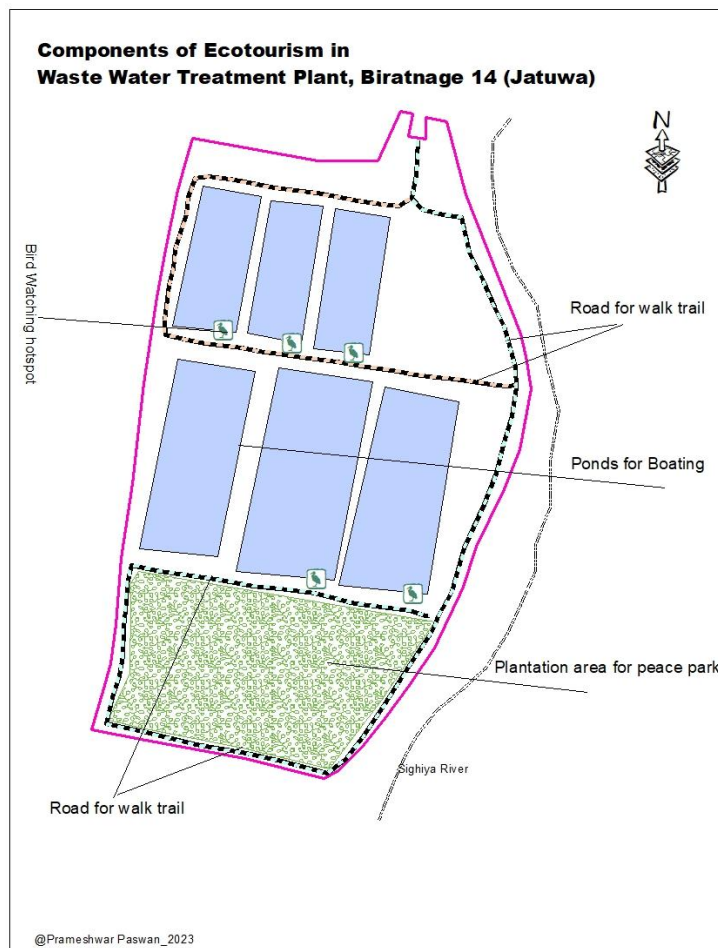
During the photography sessions, five hotspots for bird watching were discovered within the plant. These hotspots were strategically located in the southern corner of each of the plant's ponds, as indicated on Map 2. This information provides valuable insights for bird watchers, as it highlights specific areas where a higher concentration of bird species can be observed and photographed. By focusing their attention on these designated locations, bird watchers can maximize their chances of encountering a variety of bird species and capturing captivating photographs.

The factory has six ponds in total, with the three southern ponds occupying a large area of 2.43 hectares. These ponds not only add to the plant's aesthetic appeal, but they also

provide a safe setting for boating sports. Visitors can take leisurely boat rides on these ponds, immersing themselves in the peace and beauty of their surroundings.

Additionally, the plant encompasses a 1.5 km road that traverses its premises, offering an ideal setting for a walking trail. This road, depicted on Map 2, provides a designated path for visitors to engage in walking exercises, explore the plant's diverse landscape, and enjoy a refreshing outdoor experience. The availability of a well-maintained walking trail contributes to the plant's appeal as a recreational destination, allowing visitors to combine physical activity with an appreciation of nature.

Moreover, within the plant, there is a two-hectare plantation area. This area presents a unique opportunity for individuals interested in yoga and seeking a peaceful environment for relaxation and meditation. With its serene ambiance and natural beauty, the plantation area serves as an ideal location for practicing yoga or creating a designated peace park. Visitors can find solace in the tranquility offered by this area, fostering a sense of harmony between mind, body, and nature.



Map 2: Components of Ecotourism in waste water Treatment plant

## **Discussion**

Ecotourism activities including bird watching, walking trails, and boating are not new in water treatment plants. Many plants around the world have provided such environmental resources for education and profit. The Western Treatment Plant at Werribee, west of Melbourne, is one of Australia's premier birding sites, described as a 'Disneyland for birdwatchers', with 284 species recorded. The Western Treatment Plant is one of Australia's best-known sites for recreational birding, with about 270 species of birds recorded there. Access to the Western Treatment Plant for bird watching is by permit only; permits can be obtained from Melbourne Water (BirdLife International, 2011). Similarly the Victoria's waste stabilization ponds support more birds and more bird species than any natural pools in the state (Australian Geographic, 2017).

According to the Massachusetts Water Resources Authority, the Deer Island Wastewater Treatment Plant in Boston, Massachusetts has a walking and cycling trail that offers scenic views of the Boston Harbor and the city skyline (n.d.). Similarly According to the East Bay Municipal Utility District, the Wastewater Treatment Plant in Oakland, California has a wildlife habitat and observation deck that offers bird watching opportunities (EBMUD, n.d.). Moreover According to the Brussels-North Wastewater Treatment Plant website, the plant has a park area with a lake that allows for recreational activities such as fishing and boating (Brussels-North Wastewater Treatment Plant, n.d.).

The additional findings from various locations support the predominance of ecotourism activities in water treatment plants. These findings support this study that emphasized the usefulness of such sites for bird watching, walking paths, and boating, while also emphasizing other recreation options. The Western Treatment Plant at Werribee, Australia, emerges as a renowned birding site, with a remarkable record of 284 bird species observed. This finding reinforces this research's quantitative representation of captured birds and showcases the plant's rich avian diversity. Similarly, the plant's reputation as a popular destination for recreational birding, with about 270 bird species recorded, aligns with the visitors' positive responses and agreement highlighted in this research.

Furthermore, the requirement of authorizations for bird viewing access at the Western Treatment Plant underscores the importance of adequate management and control, which was also addressed in this research's administration suggestions. This highlights the importance of balancing visitor access with ecological preservation.

The additional findings from various sites reinforce the research by demonstrating similar ecotourism operations in water treatment plants around the world. Examples include the Deer Island Wastewater Treatment Plant in Boston, Massachusetts, which has a walking and cycling track with scenic vistas, and the Oakland Wastewater Treatment Plant, which has a wildlife habitat with an observation platform for bird

viewing. These examples demonstrate the variety of recreational and environmental activities accessible in water treatment plants.

## Conclusion

Tourism is the largest and fastest growing industry in the world. Ecotourism benefits for local societies and cultures, together with the provision for tourists of a positive, educative experience. The Biratnagar waste water treatment plant can sustain the dense population for recreational and educational purposes, and it is suitable for extra income through bird viewing, walking trails, and boating.

The recorded 27 varieties of birds provide a good opportunity for bird watching hub, the southern 3 ponds provide for boating and can support 6 medium-sized boats, the 1.5 km road allows for walking, and the 2 hector plantation area allows for Peace Park.

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**Annex 1: Recorded Birds of Waste water treatment Plant Biratnagar 14 (Jatuwa).**



**Figure 1: Asian green bee-eater**



**Figure 2: Pied kingfisher**



**Figure 3: Black-crowned night heron**



**Figure 4: Squacco heron**



**Figure 5 : Scaly-breasted munia**



**Figure 6 : Shikra**



Figure 9 : Neotropic cormorant



Figure 10 : Isabelline shrike



Figure 11 : Jungle babbler



Figure 12 : Great cormorant



Figure 13 : Spotted Dove



Figure 14 : Grey heron



Figure 15 : Black-backed wagtail



Figure 16 : Common greenshank



Figure 17 :Red-vented bulbul



Figure 18 : Great egret



Figure 19 :Great blue heron



Figure 20 : Cormorants Flying Over Camargue



Figure 24 : Red-wattled lapwings



Figure 23 : Plain prinia



Figure 22 : Great grey shrike



Figure 21 : hoopoe



Figure 26: Lesser whistling duck



Figure 27: Asian Pied Starling (Right side of Image)