

A project report on

PINK PANDEMONIUM



To be presented by students of

Lodha World School, Palava

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Abstract:

The project that we took up was based on our research question, "Does an association exist between the water quality of Navi Mumbai wetlands and the increase in the number of flamingos visiting them each year?" The research was initiated to test our hypothesis that there exists a relationship behind the increase in the number of flamingos migrating to the Thane creek and the pollution levels in the creek which has led to the subsequent rise of food resources. Analytical tests were conducted to test environmental quality. Field visits and ecology awareness surveys were conducted to verify and back our initial hypothesis. Through our research we conferred that the flamingo numbers in Navi Mumbai wetlands have escalated because of the increase in the occurrence of algal bloom and the subsequent rise of food resources in its water bodies caused due to the degrading water quality of Thane creek (Navi Mumbai) hence proving that our initial hypothesis was true. Through our research we found out that the ongoing redevelopment activities at the study site and the current state of its water bodies have already caused erratic changes in the arrival of migratory birds which if not altered at the earliest could lead to degradation and destruction of the local habitat leading to a disturbance in the food web directly or indirectly affecting the flora and fauna of the city.

(228 words)

Research Question:

What has led to the increase in the migration of the flamingos to Navi Mumbai?

Keywords: Flamingo, bio-indicators, anthropogenic pressure

Rationale:**Personal response:**

I, Samidha Landge, a student of class 7 of Lodha World School, Palava, earlier resided in Nerul (Seawoods) and usually every morning, especially during the winters, I sighted the flamboyance of flamingos visiting certain water bodies close to my place. Despite shifting residences, I regularly visited my previous residence to have a look at these splendidly poised birds walking precariously in the water bodies, skimming in search of food, adults tending to their young ones and simply watching them glide in flocks above me. With my frequent visits to the site, to my surprise and delight, I could always observe the number of flamingos visiting the site increasing ever so slightly with every passing year.

I pondered about what might be the reason for this increase in migration of flamingos and consequently, with the aid of my teammates, I decided to get to the depth of it. After discussing amongst ourselves, we came up with a few assumptions for the occurrence which were as follows,

- i. The food requirements of flamingos might be easily satisfied in this region.
- ii. The living conditions available to them at this location might be more suitable for them than at their previous conditions.
- iii. The location might be a good nesting and egg laying site.
- iv. Resources required by them might have dwindled at the sites where they might have previously migrated to.

Other reasons:

While conducting a thorough analysis to obtain more conclusive evidences, we did a background research about the topic and found out the following information,

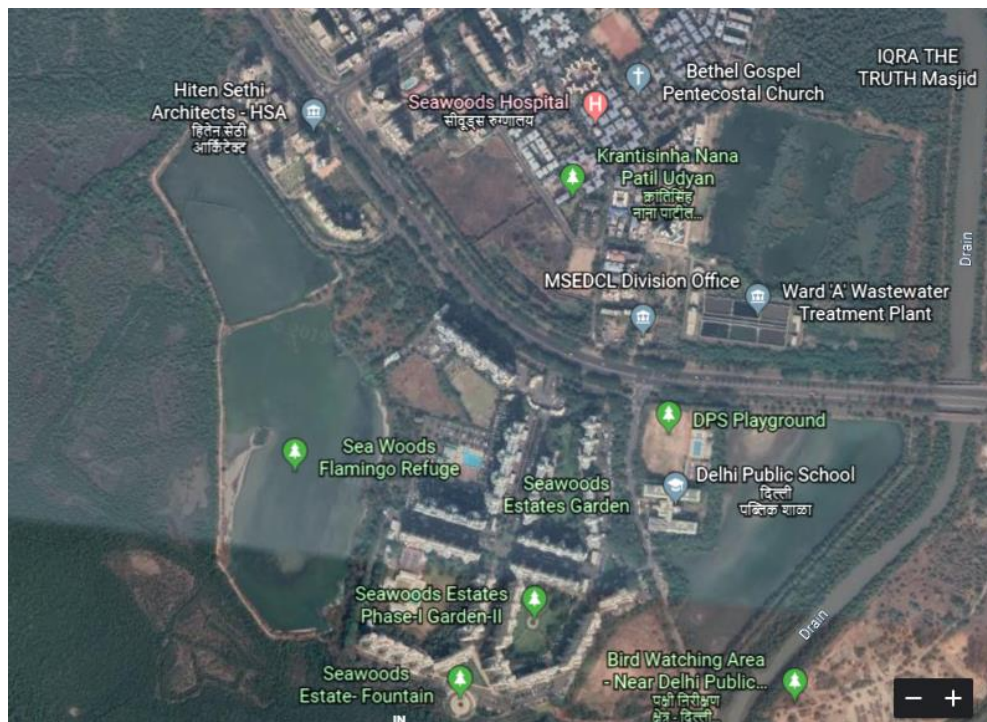
- i. The number of flamingos in Mumbai has risen from approximately 24,000 in May 2018, to 1,21,000 in January 2019. (Rahul Khot, BNHS, Hindustan Times 2019)
- ii. The number of Lesser flamingos are on the rise while those of Greater flamingos are declining. (Rahul Khot, BNHS, Hindustan Times 2019)
- iii. The sewage in the creek promotes biological growth of blue-green algae, which is food for the flamingo. (Debi Goenka, BNHS, The Guardian, 2019)

iv. Nutritional composition and quality of the phytoplankton community influence the temporal and spatial abundance of Lesser Flamingos although other factors such as the prevailing environmental conditions may take precedence. (Mary Kaggwa et al., 2012)

Assessing the evidences that we collected, we could conclude that there is a connection between the water quality of the Thane creek, the aquatic biotic boom resulted from it and the rise in flamingo numbers.

Research Methodology:

Study area:



NRI Colony / Seawoods Flamingo Refuge (19°00'16"N, 73°00'44"E)

Seawoods Flamingo Refuge opposite NRI Colony, Seawoods is a locality in Navi Mumbai region of Maharashtra. The location nestled in a residential complex, NRI Complex phase-1 &2, off Palm Beach Road, is a holding pond called Talawe Wetlands, which draws hundreds of flamingos looking for food in shallow waters of the pond, quite often arriving in flocks, throughout the months between December and March. There is also a pathway to walk around the pond to view them. Besides lesser and greater flamingos, the location is also home to many birds, insects, fishes, reptiles species and various varieties of mangrove flora.

Due to recent advent of redevelopment, there have been many ongoing activities which unless monitored and controlled will definitely lead to the loss of the habitat and its components in the near future.

Methodology:

The study area was explored in the month of November 2019 and was visited twice during the study period. Field data was collected by Pollard walk method i.e. walking along the fixed paths while recording and counting the species when the birds are most active that is from 0700h to 1300h. Bird species were identified directly in the field visually with the help of photography followed by field guide verification. The visits were guided by a naturalist (Jaya Waghmare, ZEN Foundation) who had studied the site for more than 4 years and was also interviewed to obtain information regarding the research topic.

Water samples collected during the visits were tested to obtain qualitative and quantitative data either in the school premises or from private enterprises. The data acquired during the study was compared to preexisting data to reach clear conclusions regarding result of the research undertaken. (Environmental Status Report of Navi Mumbai Municipal Corporation 2016-17)

Assessment of awareness regarding the subject matter and effects of anthropogenic activities was done by online questionnaire method and collecting photographic evidences.

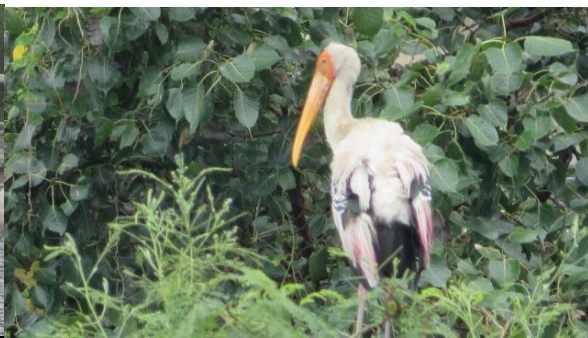
Observations:

1) On site observations:

The biodiversity observed at and around the site is as follows:



Greater and lesser Flamingo



Painted Stork



Wire tailed swallow



Grey heron



Scaly-breasted Munia



Black winged Stilt



Red wattled Lapwing



Common Sandpiper



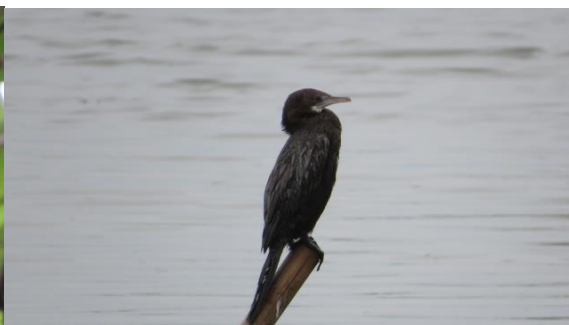
Spot billed duck



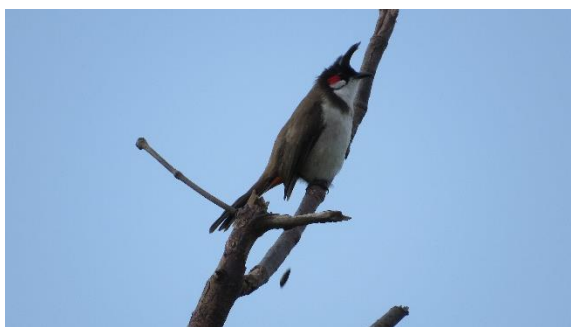
Intermediate Egret



Brown breasted flycatcher



Indian Cormorant



Red-whiskered bulbul



White-eared Bulbul



Blue Oakleaf butterfly



Plain Tiger butterfly

Srl. no.	Name of the Organism
Birds	
1.	Greater Flamingo, <i>Phoenicopterus roseus</i>
2.	Lesser Flamingo, <i>Phoenicoparrus minor</i>
3.	House Crow, <i>Corvus splendens</i>
4.	Jungle Crow, <i>Corvus macrorhynchos</i>
5.	House Sparrow, <i>Passer domesticus</i>
6.	Southern Coucal, <i>Centropus sinensis</i>
7.	Cattle Egret, <i>Bubulcus ibis</i>
8.	Little Egret, <i>Egretta garzetta</i>
9.	Intermediate Egret, <i>Ardea intermedia</i>
10.	Great Egret, <i>Ardea alba</i>
11.	Blyth's Reed Warbler, <i>Acrocephalus dumetorum</i>
12.	Booted Warbler, <i>Iduna caligata</i>
13.	Eurasian Spoonbill, <i>Platalea leucorodia</i>
14.	Common Sandpiper, <i>Actitis hypoleucos</i>
15.	Black headed Ibis, <i>Threskiornis melanocephalus</i>
16.	Black winged Stilt, <i>Himantopus himantopus</i>
17.	Painted Stork, <i>Mycteria leucocephala</i>
18.	Northern Pintail, <i>Anas acuta</i>
19.	Spot-billed Duck, <i>Anas poecilorhyncha</i>
20.	Blue Rock Pigeon, <i>Columba livia</i>
21.	Blue-tailed Bee-eater, <i>Merops philippinus</i>

22.	Rose-ringed Parakeet, <i>Psittacula krameri</i>
23.	White-throated Kingfisher, <i>Halcyon smyrnensis</i>
24.	Common Kingfisher, <i>Alcedo atthis</i>
25.	Little Cormorant, <i>Microcarbo niger</i>
26.	Indian Cormorant, <i>Phalacrocorax fuscicollis</i>
27.	Whiskered Tern, <i>Chlidonias hybrida</i>
28.	Glossy Ibis, <i>Plegadis falcinellus</i>
29.	Black Kite, <i>Milvus migrans</i>
30.	Eurasian Marsh Harrier, <i>Circus aeruginosus</i>
31.	Montagu's Harrier, <i>Circus pygargus</i>
32.	Common Myna, <i>Acridotheres tristis</i>
33.	Scaly-breasted Munia, <i>Lonchura punctulata</i>
34.	Ashy Prinia, <i>Prinia socialis</i>
35.	Wire-tailed Swallow, <i>Hirundo smithii</i>
36.	White-eared Bulbul, <i>Pycnonotus leucotis</i>
37.	Red-whiskered Bulbul <i>Pycnonotus jocosus</i>
38.	Brown-breasted flycatcher, <i>Muscicapa muttui</i>
Insects	
1.	Chocolate Pansy butterfly, <i>Junonia iphita</i>
2.	Grey Pansy butterfly, <i>Junonia atlites</i>
3.	Plain Tiger butterfly, <i>Danaus chrysippus</i>
4.	Striped Tiger butterfly, <i>Danaus genutia</i>
5.	Blue Oakleaf butterfly, <i>Kallima horsfieldi</i>
6.	Small Salmon Arab butterfly, <i>Colotis amata</i>
7.	Peacock Pansy butterfly, <i>Junonia almana</i>
8.	Danaid Eggfly butterfly, <i>Hypolimnas misippus</i>
9.	Common Cerulean butterfly, <i>Jamides celeno</i>
10.	Dragonfly varieties
11.	Damselfly varieties
Others	
1.	Marshland crabs
2.	Mudskippers



Students in conversation with Jaya W (Naturalist, ZEN Foundation)



Algal growth on water at the study side

- We observed that the location was frequented by many joggers and bird watchers.
- The water on observation seemed to have a distinct greasy, oily layer on its surface and looked dark and muddy.
- There was a dense algal growth on the water surface and the water birds were flocked near these algal patches.
- Compared to the past few years, the flamingos seen at this time of the year were visibly less and there were more juveniles than adults. (Jaya Waghmare, ZEN Foundation, 2019)

b) Chemical analysis reports:

Chemical analysis of water samples were undertaken and the results were as follows:



Water Sample analysis

Parameters	Visit 1	Visit 2
pH	8.5	8.0
Total dissolved solids (mg/L)	970	890
Dissolved oxygen (mg/L)	5.0	5.4
Biochemical oxygen demand (mg/L)	5	4

Low dissolved oxygen (DO) primarily results from excessive algae growth caused by phosphorus. Nitrogen is another nutrient that can contribute to algae growth. As the algae die and decompose, the process consumes dissolved oxygen. This can result in insufficient amounts of dissolved oxygen available for fish and other aquatic life. Die-off and decomposition of submerged plants also contributes to low dissolved oxygen. The process of decomposition is called Biochemical Oxygen Demand (BOD). (Minnesota Pollution Control Agency, 2009)

Lesser and greater flamingos are specialised feeder which feed on microscopic cyanobacteria and algae (Lothar Krienitz et al., 2016). From our observations we could infer that the conditions present here and the water quality of the water body are suitable for algal growth, hence algal blooms are frequently observed in this location providing ample food resources to the flamingos.

c) Survey report:

We created a survey sheet to understand the level of awareness the residents had regarding the significance of project topic. Wherever possible, we also tried to interview few residents in person to obtain their response. We also gathered information from newspaper articles of opinions voiced by the residents and experts regarding the issue at hand. The survey report was as follows,

PINK PANDEMONIUM	
*Required	
Name *	
Your answer	
Age *	
Your answer	
Sex	
☐ Female	
☐ Male	
Occupation *	
Your answer	
1. From how many years have you been residing in this location?	2. What do you like the most about this location?
☐ Less than 5 years	☐ Green cover
☐ 5 to 10 years	☐ Pleasant climate
☐ More than 10 years	☐ Availability of modern amenities
	☐ Others
	3. How frequently do you participate in bird watching/nature trails?
	☐ Very frequently
	☐ Rarely
	☐ Never
	4. Do you see birds migrating in your area?
	☐ Yes
	☐ No
	☐ Maybe
	5. Which bird amongst the following do you see the most in your vicinity?
	☐ Flamingos
	☐ Storks
	☐ Ducks

6. What do you think the flamingos feed the most on?

- ☐ Fish
- ☐ Algae
- ☐ Insects

7. In your opinion, what is the prime reason behind migration of birds in your area?

- ☐ Availability of food
- ☐ Climatic conditions
- ☐ Lack of predators
- ☐ None of the above
- ☐ All of the above

8. Do you think that the number of Flamingos have increased over a period of time?

- ☐ Yes
- ☐ No
- ☐ Maybe

9. If yes then why? If no then why? *

Your answer _____

10. Do you think that migration of flamingos is important for the ecosystem?

- ☐ Yes
- ☐ No
- ☐ Maybe

11. If yes then why? If no then why? *

Your answer _____

12. How would you rate the water quality in your location

- ☐ Good
- ☐ Satisfactory
- ☐ Poor

13. To what extent are you convinced that the water quality of your location is declining?

- ☐ Strongly convinced
- ☐ Somewhat convinced
- ☐ Not at all convinced
- ☐ Do not know

14. Are you aware of the term Eutrophication?

- ☐ I've heard about it and know what it means
- ☐ I've heard about it but don't know what it means
- ☐ I've never heard about it

15. Are you aware of the term Bio magnification?

- ☐ I've heard about it and know what it means
- ☐ I've heard about it but don't know what it means
- ☐ I've never heard about it

16. In your opinion, to what extent is the conservation of environment a social task?

- ☐ yes, it is
- ☐ somewhat
- ☐ no, it is not

17. Do you think that environment should be conserved for our children and future generations to inherit?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

18. Do you think that the conservation of environment is conducive to our wellbeing and quality of life?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

19. Do you think that to protect the environment, less land should be given over to the development of residential/commercial areas and traffic infrastructure?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

20. Do you feel personally affected when the environmental quality declines?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

21. Do you feel a personal responsibility towards conserving the environment?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

22. Do you think that many reports of the decline in the environmental quality are exaggerated?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

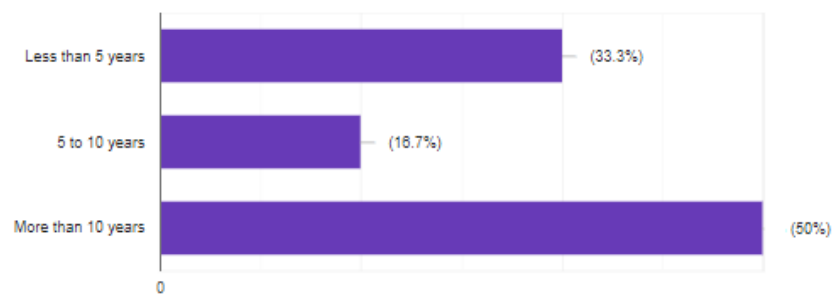
23. Do you think that spending on conservation of environment should be reduced?

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Strongly disagree
- ☐ Somewhat disagree

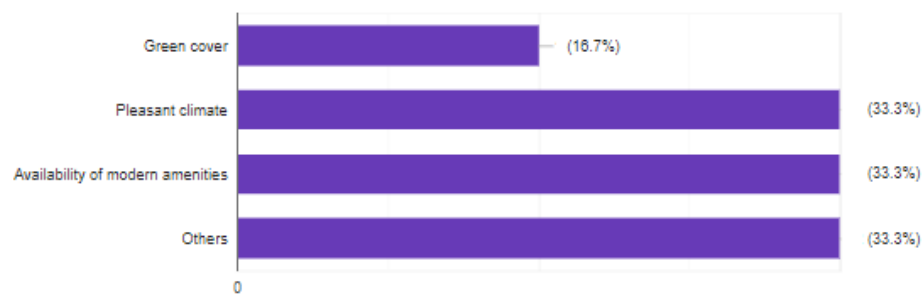
Submit

The response to our survey was as follows:

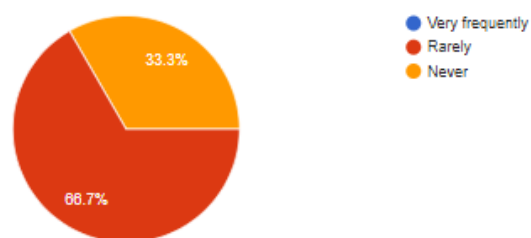
1. From how many years have you been residing in this location?



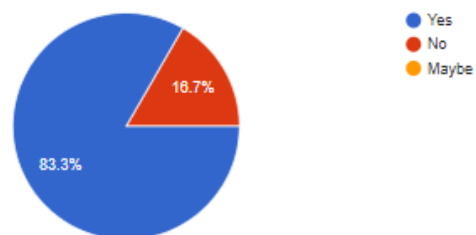
2. What do you like the most about this location?



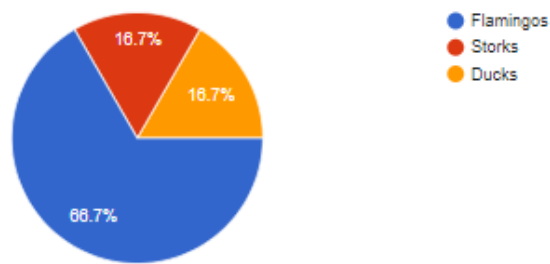
3. How frequently do you participate in bird watching/nature trails?



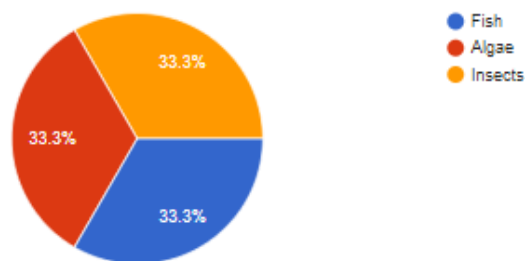
4. Do you see birds migrating in your area?



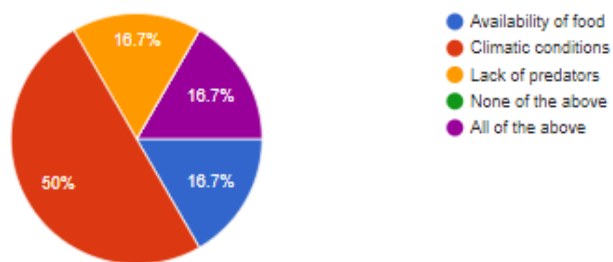
5. Which bird amongst the following do you see the most in your vicinity?



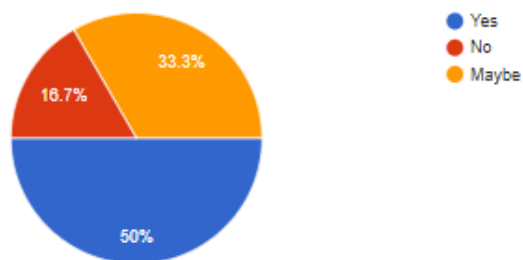
6. What do you think the flamingos feed the most on?



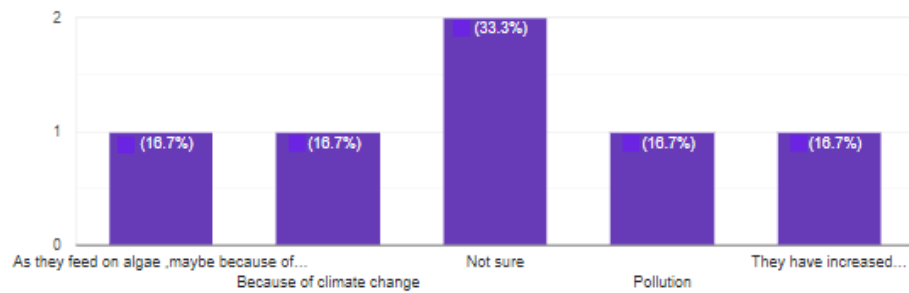
7. In your opinion, what is the prime reason behind migration of birds in your area?



8. Do you think that the number of Flamingos have increased over a period of time?

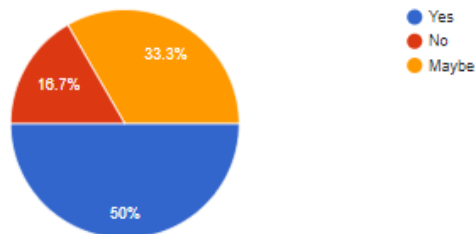


9. If yes then why? If no then why?



10. Do you think that migration of flamingos is important for the ecosystem?

6 responses



11. If yes then why? If no then why?

Climate change

Flamingos feed in shallow bodies of water, and often use their large feet to stir organisms from the bottom up into the water column.

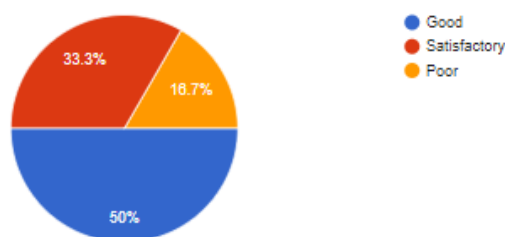
As they eat algae maybe growth of algae is reduced

To maintain the balance in eco system

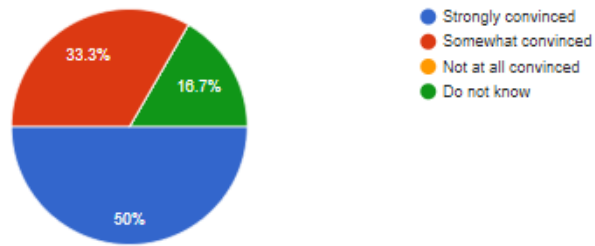
I don't know

Not sure

12. How would you rate the water quality in your location



13. To what extent are you convinced that the water quality of your location is declining?



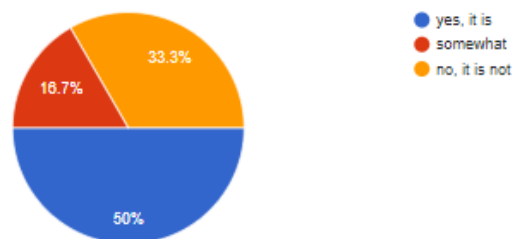
14. Are you aware of the term Eutrophication?



15. Are you aware of the term Bio magnification?



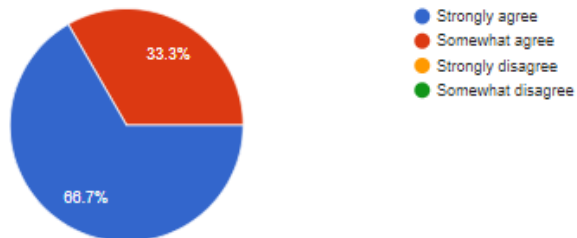
16. In your opinion, to what extent is the conservation of environment a social task?



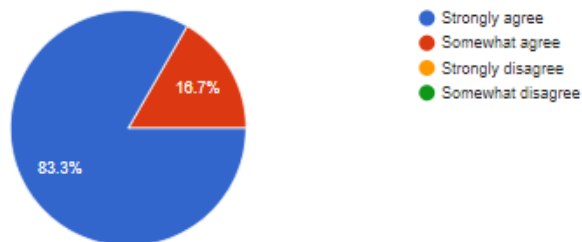
17. Do you think that environment should be conserved for our children and future generations to inherit?



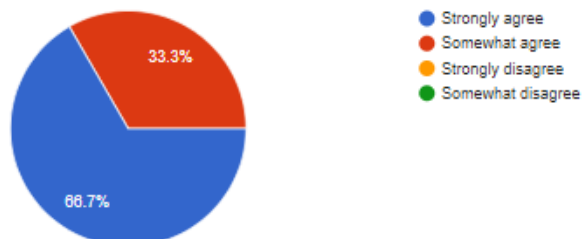
18. Do you think that the conservation of environment is conducive to our wellbeing and quality of life?



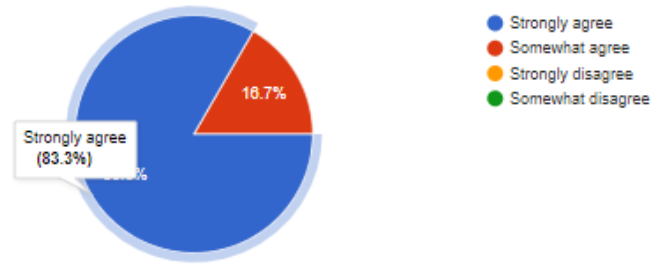
19. Do you think that to protect the environment, less land should be given over to the development of residential/commercial areas and traffic infrastructure?



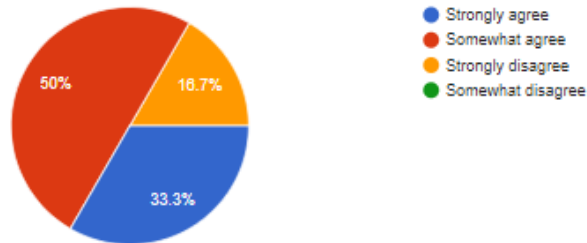
20. Do you feel personally affected when the environmental quality declines?



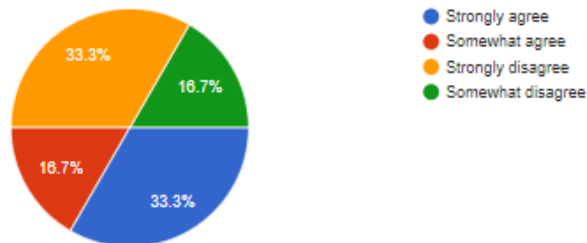
21. Do you feel a personal responsibility towards conserving the environment?



22. Do you think that many reports of the decline in the environmental quality are exaggerated?



23. Do you think that spending on conservation of environment should be reduced?



From the survey we conducted, we observed that

- A majority of them lived in the premises close to the study site for more than five years (67%) and preferred staying there due to the climate and amenities available close (67%) by than for the greenery (17%) available there.
- A third of the people interviewed were interested in bird watching and 83% of them had observed various migratory birds flocking in their vicinity.
- 50% of the people interviewed had observed a definite rise in the number of migratory birds (especially flamingos) coming to the study site and the same number of people thought that the migration of flamingos is important for the ecosystem.

- About 50% of the people surveyed believed that the water quality of the water bodies is below the desired level and that it is declining even further.
- There is a huge majority of the people surveyed who weren't aware of eutrophication (83%) and bio-magnification (67%) caused due to water pollution.
- Every one surveyed agreed that environment should be conserved and that it is conducive for our wellbeing and quality of life but only 50% believed that conservation of environment is a social task.
- 83% of the people surveyed think that habitats should be conserved, less land should be given for infrastructural development and feel a personal responsibility towards conserving environment.
- Surprisingly, the people surveyed were split in half when it came to the authenticity of the various incidents of environmental degradation and were indecisive when it came to increase the funds for environmental conservation.
- Residents believe that while there is no conclusive reason for the absence of the flamingos this year, land-filling work carried out by The City and Industrial Development Corporation of Maharashtra (CIDCO) earlier and the erected boundary wall could be one of the reasons for the change in the landing patterns of the birds. (The Asian Age, 2019)
- "A boundary wall which was erected in November last year is visible from a distance. There were also land-filling activities in the lake to cover the entire water body. Flamingos do not come if there is any kind of disturbance in their habitat area," said Sunil Agrawal, resident of NRI complex, Seawoods. (The Asian Age, 2019)
- Bird enthusiasts also claimed that there are other birds like egrets and pintail ducks, however, the migratory birds are less in number. "Even painted stork and spoonbills birds are hardly to be seen this year, which were in large numbers in this wetland," said Pawan Kumar Sahu, a bird enthusiast and photographer. (The Asian Age, 2019)
- However, experts have stated that it is too early to come to a conclusion. "Although the earlier reclamation or boundary wall by CIDCO could be a reason, but it was also seen that the water level in the lake area was higher. Flamingos prefer shallow water for their habitat and feeding activities," said Isaac Kehimkar, director, iNaturewatch Foundation. (The Asian Age, 2019)
- Experts at Bombay Natural History Society (BNHS) claimed that "The flamingos are certainly less in number this year. There was a good amount of rainfall in Kutch, Gujrat due to which the flamingos might be finding the marshy lands there suitable for their habitat and feeding purpose. They should be here by next month," said Deepak Apte, Director, BNHS. (The Asian Age, 2019)

Conclusion:**Inference:**

We had hypothesized that the flamingo numbers in Navi Mumbai wetlands have escalated because of the increase in the occurrence of algal bloom and the subsequent rise of food resources in its water bodies caused due to the degrading water quality of Thane creek (Navi Mumbai). Based on the biodiversity observed at the study site in the current survey and in the previous observations, it can be fairly said that the location provides a flourishing habitat for its various avian residents, that is if the said habitat is left undisturbed from the various human activities. Results observed from our studies have showed that the existing level of disturbances at the study site has led to a marked decrease in the levels of diversity and richness of water birds this year. We could conclude confidently that human activities like redevelopment based construction and dumping of debris at certain locations at the study site were responsible for affecting the water quality of the water bodies leading to algal blooms and subsequent rise in the number of flamingos in the past few year. The causes mentioned above in association with the erratic weather patterns and torrential rains could be a strong cause for delay in the arrival of flamingos this year.

We also discovered the fact that an 18-hole golf course and a residential colony with 17 towers was planned to be constructed at the site. CIDCO had initially mooted plans for a golf course in 2002. In 2016, the state changed the reservation in the development zone to regional park and residential zone. The project was awarded to Mistri Constructions. CIDCO claimed the water bodies were not wetlands but salt pan land in a low-lying area. It also relied on a report by Bombay Natural History Society (BNHS) claiming the project was necessary to prevent possible bird hits at the nearby Navi Mumbai international airport. The High Court rejected both contentions and said the water bodies were wetlands shown in the National Wetlands Inventory and Assessment (NWIA) report and therefore "protected." "These water bodies form (an) essential and important part of our ecosystem which cannot be eroded for providing for commercial or other uses. There is no material placed on record in the form of an opinion of experts to show that for preventing possible bird hits, the golf course is the only viable solution," the judges said. The court held it was the obligation of Cidco, NMMC and the state to preserve and protect all lakes in Navi Mumbai. Further, its September 2018 orders will apply in Navi Mumbai. These relate to treating mangroves as protected forests and preventing their destruction, including by hacking or dumping of garbage and debris on mangrove lands or in the buffer zone. (Times of India, 2019)

Through our survey and interviews, we could gauge that the residents of the study site have shown to be aware of the issue at hand and have taken an initiative for the conservation of the site by actively protesting the redevelopment which was supposed to happen at the site.

We could document through our studies that increase in the extent of human activities have led to clearing of pre-existing green spaces and reducing expanse of water bodies leading to a changes in the number of migrant and endemic water birds visiting the site. The study can be used to gauge the extent of deteriorating health of the ecosystem in the study area and propose measures for its restoration and conservation.

References:

- A Baseline study of habitat and abundance of Lesser Flamingo (*Phoeniconaias minor*) in Sewri mudflat, Mumbai, India – Amit Patil et al., 2014
- A preliminary survey on the birds of Thane creek, Maharashtra, India – Sheetal Chaudari – Pachpande et al., 2016
- A detailed time series assessment of the diet of Lesser Flamingos: further explanation for their itinerant behavior – Mary Kagwwa et al., 2012
- Biodiversity of Thane Creek – R. P. Athalye, 2013
- Ecology and composition of zooplankton from Sewri creek, west coast of India – Mohammed Shaikh et al., 2012
- Food algae for Lesser Flamingos: a stocktaking – Lothar Krienitz et al., 2016
- Bulletin of the IUCN-SSC/Wetlands International – Flamingo Specialist Group, 2018
- Sediment Quality of Sewri Mudflats, Mumbai, West Coast of India – Mohammed Shaikh, 2012
- What causes algal blooms? – Centre for Earth and Environmental science, 2019
- Environmental Status Report of Navi Mumbai Municipal Corporation 2016-17
- HC quashes plan for golf course, towers on Navi Mumbai wetlands – Times of India, 2018
- Flamingos yet to arrive at Seawoods wetland – Asian Age, 2018
- Mudflats destruction to lead birds coming in way of Navi Mumbai International Airport: Study – Hindustan Times, 2019
- Arrival of flamingos at Navi Mumbai wetlands offers new hope against golf course project – Hindustan Times, 2019
- A double-edged sword': Mumbai pollution 'perfect' for flamingos – The Guardian, 2019
- Why Did Flamingos Flock to Mumbai in Record Numbers This Winter? – Smithsonian.com, 2019
- Fight to save wetlands if you want to see flamingos every year – Times of India, 2019
- Birds of the Indian Subcontinent – Inskipp and Grimmet
- BNHS Field Guide Butterflies of India – Isaac Kehimkar

Reflections:

Group Reflections:

Indicators -Collaboration	4	3	2	1
<u>Every</u> member of the team was <u>always</u> prepared, well informed on the project topic and ready to work.		✓		
<u>Every</u> member of the team <u>always</u> completed assigned tasks on time without having to be reminded.			✓	
As a team, we created a detailed task list that divided project work reasonably among the team members.		✓		
As a team, we set a schedule and tracked progress toward goals and deadlines.			✓	
As a team, we used time and ran meetings efficiently; kept materials, drafts, notes organized			✓	
As a team, we developed ideas and created products with the involvement of <u>all</u> team members		✓		
Indicators Communication	4	3	2	1
Every member of the team listened to others' ideas without interrupting; responded positively to ideas even if rejecting.	✓			
Team members communicated openly and treated one another with respect.	✓			

Every member of the team felt safe and free to seek assistance and information, share resources and insights, provide advice, or ask questions of each other.	✓			
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Individual reflections:

Samidha Landge: What I enjoyed the most during this project was actually going on the field and conducting a survey which helped us in practical learning. The difficulty that I faced was trying to identify and distinguish between the two varieties of flamingos. With the help of field expert, I developed the keys of identifying birds with the help of identification keys provided by her. Eg. Greater flamingos have a pink beak with a restrictive black tip and pink skin from the eye to the beak, whereas lesser flamingos have dark red beak with black tip and deep yellow-orange eyes surrounded by a reddish-brown ring.

Aastha Herwade: For me the most enjoyable thing during the project was going to NRI colony and watching the flamingos. The one thing that I struggled with most during the project was researching about the food habits and living habitats of the flamingos. The most important skill which I developed during the project is confidence as at first I was not confident with public speaking but now I feel better prepared.

Prishita Dharmpal: Exploring the naturescapes present so close to our residence to observe the flamingos and conducting surveys was the most intriguing part of the project. Working in unison as a team and learning by doing are some of the skills that I learnt while conducting the project.

Khushi Sao: Group projects are always enjoyable, moreover, CAL gave us the opportunity to think originally and explore our city, which was the most exciting and enjoyable part of the project. We initially struggled with choosing genuine problem in our locality, which was the most challenging part for me. Being a part of the project has made me a better listener and it also developed my analytical skills.

Prayunj Kulkarni: We all were given an opportunity to choose and conduct a research based on real life problems in our locality, which was very enjoyable for me. The one thing I struggled with the most was to finalise the procedure for our project. I personally developed leadership qualities, coordination and rational thinking in the process of the project which proved to be a benefit for me in real life situations.