

RESEARCH AND DEVELOPMENT

CHAPTER SIX

Research and development activities play an important role in assessment and control of pollution, environmental quality assessment, identification of priority areas in air and water pollution control and industry specific research studies. Research and development comprise of exclusive activities like basic research, applied research and experimental development. Again, environmental research may be of laboratory-based experimental studies or entirely theoretical work, or it may be entirely of field studies. Field studies can be pre-planned with a definite start and finish, or it can be of accidental type, i.e., inferences drawn from discreet field observations about which the observer had no previous information, and the following study is of that type. During 2006-2007, some interesting field observations were done on

migratory wild ducks in some industries at Haldia which is illustrated below.

Migratory Wild Ducks at Haldia Industries

Migration is a very important aspect of animal world that has been maximally studied in case of birds. Migration is observed in different groups of birds from the tiny arboreal warblers to the giant marine albatrosses. Migratory birds know no political boundary, and protecting a waterfowl habitat means supporting the conservation efforts of more than one country. In India, migratory birds are of two types:

- a) Some migrate from one place to another place within our own country; and
- b) The others are known as Trans-Himalayan Migratory Birds, which breed in the different places of North Europe, Russia etc. during the summer season.



Lesser whistling teals in Haldia area

During the winter season, the breeding habitat of the Trans-Himalayan Migratory Birds become covered under snow. As a result, they face food crisis and in search of food they travel towards the southern countries like India after flying a long stretch of about 5000 kilometres crossing the Himalayan mountain ranges. As summer approaches, they again feel the urge for returning to their breeding ground usually via the same route. The number and diversity of migratory birds may vary from year to year due to the following reasons:

- a) Disturbance in their breeding ground due to anthropogenic causes or due to climatic calamity;

- b) Natural calamity during the long transit comprising several thousands kilometres;
- c) Availability of suitable habitat in the tropical/sub-tropical belt during the winter months; and
- d) The recent issue of global warming may have significant role in changing the pattern of migration of migratory birds.

Among waterfowls, wild ducks hold an important ecological status because they generally prefer water bodies of medium depth. In the southern West Bengal, wild ducks of lentic type generally migrate here, as they are the ones who prefer non-flowing water bodies.

Haldia occupies a very important place in West Bengal as an industrial area and such importance would be enhanced manifold in the near future. Most of the industries at Haldia are broadly chemical-based industries. As known so far, no work had been carried out on migratory ducks at Haldia till date. Migratory wild ducks at Haldia are primarily discussed in this paper based on some isolated observations done in February-March 2007, and some were made much earlier. The number and diversity of migratory ducks were observed in different water bodies of the four industries located at Haldia, the findings of which are quite astonishing. The four industries comprise of chemical, petrochemical, pesticide industries and a shipping dock.



A wide diversity of migratory wild ducks is observed in the waterbodies of Haldia

TABLE 2.6.1
NUMBER AND TYPE OF SPECIES OBSERVED AT FOUR SITES

Turning Basin, Haldia Dock Complex			
<i>Handling</i> Coal, Iron Ore, Container			
<i>Date of Observations</i>	<i>Name of waterfowl</i>	<i>Scientific Name</i>	<i>Approximate No.</i>
24.02.2007	Gadwall	● <i>Anas strepera</i>	60
12.12.2004	Could not identify because of distance		100
SWAL Corp. Ltd.			
<i>Product:</i> Organophosphate Pesticides, namely Acephate, Ethion, & Dimethoate			
<i>Use of 3 adjacent ponds:</i> Water storage			
<i>Date of Observations</i>	<i>Name of waterfowl</i>	<i>Scientific Name</i>	<i>Approximate No.</i>
8.2.2007	● Common Teal (male) ● Wigeon (male) ● Shoveller (male) ● Gadwall ● Female ducks	● <i>Anas crecca</i> ● <i>Anas penelope</i> ● <i>Anas clypeata</i> ● <i>Anas strepera</i>	10 2 10 20 50
10.2.2005	Mainly Lesser Whistling Teal and some other species	● <i>Dendrocygna javanica</i>	100
Haldia Petrochemicals Ltd.			
<i>Product:</i> Polyethylene, Polypropylene, Benzene, Butadiene, C4 Raffinate, LPG, MS EuroIII, Cyclopentane			
<i>Use of three adjacent ponds:</i> Water storage			
<i>Date of Observation</i>	<i>Name of waterfowl</i>	<i>Scientific Name</i>	<i>Approximate No.</i>
8.2.2007	● Wigeon (male) ● Pintail (male) ● Gadwall ● Garganey ● Tufted Pochard ● Cotton Teal ● Lesser Whistling Teal ● Darter ● Purple Heron	● <i>Anas penelope</i> ● <i>Anas acuta</i> ● <i>Anas strepera</i> ● <i>Anas querquedula</i> ● <i>Aythya fuligula</i> ● <i>Nettapus coromandelianus</i> ● <i>Dendrocygna javanica</i> ● <i>Anhinga melanogaster</i> ● <i>Ardea purpurea</i>	30 3 17 3 5 7 1500 1 3
Mitshubishi Chemical Corporation			
<i>Product:</i> Purified Pterephthalic Acid.			
<i>Use of the pond:</i> Water storage			
<i>Date of Observation</i>	<i>Name of waterfowl</i>	<i>Scientific Name</i>	<i>Approximate No.</i>
14.3.2007	● Gadwall	● <i>Anas strepera</i>	10

TABLE 2.6.2
ADDRESSES OF MIGRATORY WATERFOWLS
DURING BREEDING SEASON (SUMMER)

Type of Waterfowl	Habitat
1. Wigeon	Temperate region, Arctic circle and beyond, Northern Europe, Russia and mainly Siberia
2. Pintail	Northern Europe, Russia, Caspian regions and Siberia
3. Gadwall	Europe, Russia
4. Garganey	Russia
5. Tufted Pochard	Europe, Asia
6. Common Teal	Europe, Russia, mainly Caspian region, and North Siberia
7. Shoveller	Europe, Russia, Siberia.
8. Purple Heron	Worldwide, Europe, Asia, Africa
9. Cotton Teal	Different parts of Indian Subcontinent.
10. Lesser Whistling Teal	Different parts of Indian Subcontinent.
11. Darter	Different parts of Indian Subcontinent.

Depicting Table 2.6.1, it appears that Haldia falls in the route of different species of migratory ducks and the Lesser Whistling Teal has an additional preference to some of the water bodies of Haldia. It may be mentioned that although Purple Heron (*Ardea purpurea*) and Darter (*Anhinga melanogaster*) are not ducks, these have been included due to the rarity of the former one and near-threatened status of the latter.

Table 2.6.2 names a list of waterfowls of which the first eight have a global distribution and the rest three are found in the Indian sub-continent only. Common people pays more interest to the Trans-Himalayan Migratory Birds because of their adventurous behaviour, however, from the conservation point of view, our local birds are no less important because of their restricted range of distribution. In the total area of the Indian Subcontinent, these water birds reside in limited pockets and if some habitat are lost, it may cause pressure to the entire population of that particular species. This is a problem to any species who has limited range of distribution. It may not be irrelevant to mention here that about two species who had limited range of distribution played a role in cleaning our environment. Adjutant stork (*Leptoptilos dubius*) was so helpful in cleaning our environment and was so common in Kolkata in the 19th century that it was placed in the official

logo of Calcutta Municipal Corporation. However, it is almost extinct from our country now. Even 10 to 15 years back, the white-backed vulture, our commonest scavenger bird (*Gyps bengalensis*) were seen in hundreds soaring high in the sky. At present, hardly a single one is seen, as they have been almost wiped out from our country in just a decade.

The value of waterfowls in wetlands was first internationally announced in the 'International Conference on the Conservation of Wetlands and Waterfowls' held at Ramsar City, Iran in 1971, which is commonly known as the Ramsar Convention. The 8th recommendation of the Convention stated that the Government and the appropriate departments of all countries should count the waterfowl at least twice a year. If some country is unable to do the same, they should seek assistance from other countries. The Asian Wetland Bureau (AWB) coordinates the census of waterfowl in Southern West Bengal in January every year. Their report stated that at least for the last one century, the lake of Kolkata Zoo invited thousands of migratory winged beauties from far-flung areas. The number started declining to less than 100 from the late nineties, and it went to almost nil in the recent past. It was learnt from Shri Kushal Mookherjee, Member, National Board for Wildlife that all important wetlands in

and around Kolkata (like Nalban Bheri, Kalyani Lake etc.), which harboured huge numbers of waterfowl decades back, are now becoming less attractive to the migratory guests. Santragachi jheel, however, is an exception and the reason is still undetermined.

According to our general conception, migratory wild ducks are not expected in industrial environment. It is interesting that while the above-mentioned sites referred to as Birds' Paradise are losing their attraction to their feathered guests, a place like Haldia which is well known for its heavy industrial growth is becoming an abode for them. Regular monitoring may reveal the exact pattern of their movement and confirm that whether it is a regular phenomenon or a sporadic one. It is also important to scout if there is any other area at Haldia where migratory wild ducks also descend. Only a study could give us the reasons as to why those migratory wild ducks are taking their refuge in the industrial ponds despite of the threat of pollution.

From the management point of view, a general inference can be drawn that the best option is to avoid such areas for starting developmental

activities where rare animals are found or such sensitive phenomenon of nature take place. But if such things were somehow overlooked during the baseline data generation period or an industry was incepted before the regulation of Environmental Impact Assessment, there is still scope of saving nature by identifying the exact physical location of such natural activity and avoiding disturbance to that area. Be there any environmental regulation or not, our constitution confers responsibility to every citizen for protecting our flora, fauna and natural resources (Article 48A, 51A). The first step of conservation in this case is to make the occupier of the holding aware about the importance of such natural activity and avoid disturbance to that spot, But it also has to be kept in mind that any extra effort to attract the birds either may make them flee away.

As Haldia has some locational advantage for industrial development, it might be better to identify the local hotspots and progressing new industrial growth sparing only the sensitive places. If that could be done successfully, it will be an example of wonderful association between developmental activities and intrinsic activities of nature.