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DIVERSITY OF BIRD FAUNA

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Abstract

Birds are formally classified as members of the class Aves, subphylum Vertebrata, phylum Chordata, Kingdom of Animalia. They are characterized as being generally small vertebrates with feathers, scaly legs and no teeth (except in few fossil forms). They have well developed air breathing lungs, a four chambered heart and maintain a constant body temperature of about 38^0C - 44^0C. Birds reproduce by laying comparatively large, hard-shelled eggs. Amongst all other factors, the bird is a very important factor, which helps in maintaining the nature's balance. The French writer Michele said that, birds might live on this earth even if there were no men, but men couldn't live without birds." What he said is no more than the bare factual truth. Birds are an integral part of the whole system of life on this earth. Their importance is in no way less than of plants and animals (Reena and Abhijit, 2005).

Introduction:

The use of birds are so important that, nearly all birds feed on insects and worms, thus birds helps by keeping down the number of pests without disturbing ecological balance, e.g. White stork. Some birds are very good scavengers which not only clean the environment but also release the locked up nutrients in the dead organic matter. e.g. Kites, Vultures, Crows. Many of beautiful flowering trees are pollinated by birds, e.g. sunbirds, flower packers. Vermin's do enormous damage to crop and agriculture products; also carry diseases often fatal to the man. Many of the birds feed largely on these and help to farmers, e.g. owls, kites. They play predominant part in the dispersal of seed and distribution of plant life, e.g. bulbul, white-eye, koel. The fish eating birds have their own way of helping farmers and agriculturist, e.g. Cormorant *(Reena and Abhijit, 2005).*

Natural population of birds are simultaneously affected by so many factors of the environment, that their effect can be determined only by long term studies. Changes in weather, vegetation, pathogens, predators, competitors, they all affect the well being of a population, and it requires many years of study and census work to determine the relative importance of each of these factors (Reena and Abhijit, 2005).

Analysis of current avian distribution and geography is essentially concerned with two populations, the resident and the migrant. Thus, migrant birds seen in the Oriental Region in winter are dependent on the status of habitat in their summer habitat and vice versa. Resident birds in the Oriental region are related to Ethiopian, Malayan and

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Chinese avifauna in their mutual palaeontological histories.

At present, biodiversity is better understood for birds in many respect than any other major group of organisms because they probably inspire more interest in humans, are often spectacular, relatively easily observed and not too cryptic to identify. In order to understand the importance of a site for birds, it is necessary to examine its significance in terms of the presence and abundance of species that occur there in different seasons. The status and nature of these species also need to be taken into account. Threat status, breeding, vulnerability through congregation and the proportion of the total population of each species that occur at the site, are all important factors in determining a sites importance. In an era of rapid industrial growth, species economic zone and development, it is important to have an up to date knowledge of the diversity and status of birds (Yardi, 2011).

Ecosystem functioning is dictated to a large extent by diversity and the community structure that result from such a richness and evenness of diversity (Yardi, 2011.) Thus, recent studies in biology focus more on quantitative aspects of biodiversity that further helps in prioritization of areas for conservation. Birds are ideal bio-indicators and useful model for studying a variety of environmental problems. As increasingly more attraction is now given to conservation, monitoring and ecological studies (Ghorade, 2014).

Developing scientifically sound census programmers is essential in describing long term trends in bird populations, highlighting species decline and unraveling the underlying causes (Yardi, 2011). While in the developed world there has been extensive research on the standardization of birds count technique (Verner, 1975). One of the major priorities in conserving animals is monitoring changes in their population to find prescriptions for their long-term survival (Yardi, 2011). Long-term changes in birds communities in Japan were examined by using binary data based similarly index of community-the Phi Coefficient, which is useful for examining long term changes in avian communities amenable to hypothesis testing (Yardi, 2011).

Kumar (2000) stated that there are 9932 living species of birds found in the world. Human activities resulting from habitats loss and fragmentation have seriously threatened many birds and other fauna to the point of extinction. Almost 20% of bird's species were categorized as either endangered or 'nearly threatened' species in 1996 IUCN Red Data Book (Nagata, 1999). While according to IUCN report there are about 1200 threatened species of birds, further divided into rare, vulnerable, endangered, critical and extinct. Besides, there are numbers of insufficiently known species of birds at global level.

An extensive work on senses of birds, made by various organizations, checklist of birds from San Diego Country, California presented by biodiversity research center of California, which covers all species and subspecies of birds reported reliability in San Diego Country, the destruction status of each species. Whereas updated current checklist of their birds of insular newfound land and its

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continental shelf water studied by Mactavish *et. al.,* (2003), which replaced the Natural History Society of Newfound land and Labrador publication checklist (1999). The species are named in accordance with American ornithologist's union check list of North American birds, seventh edition (1998) and supplement up to and including the forty -forth supplement of the American ornithologists union check list North edition birds (2003). Such documentation provides a tool for legislators and administrator to compare current or planted work that is essential to conserve avifauna, which play important role in natural ecosystem and provides recreation to millions of citizens, who watch them as backyard birds.

In India, the avifaunal study was initiated by Blanford, (1889), Baker, (1922) and Whistler, (1949). While the pioneer work in the field of ornithology, has been carried out by Salim Ali (1968-1987) in Indian Subcontinent. Avifauna of Jamwa Ramgarh lake, Jaipur (Rajasthan) covers an area of 297 sq. miles and attracts a larger numbers both domestic and migratory birds in winter season (Yardi, 2011). The Himalayas due to their scenic beauty, forested hilly terrains, verity of plants and animals life, coupled with a healthy climate have always fascinated mankind. There are a number of hill stations throughout the Himalayan range and Shimla is one of beautiful hilly terrain, located in the map of the North-west Himalayas and is rich in floral and faunal biodiversity. Summer Hill, a suburb at the western end of shimla city, Himachal Pradesh Campus, Indian Institute of Advanced Studies, Chadwick fall and Potter's Hill area rich in avian fauna (Yardi, 2011). A systematic list of feathered biped vertebrates from Periyar Tiger Reserve, Karala (South India) prepared by Srivastava *et. al.,* (1993) and observed that, there were rarity of larger birds of prey may be due to their low population in nature or the agriculture practices in the surrounding areas.

Gole, (1980, 1984) recorded birds from Poona city and polluted Mutha river meanders through Poona city, Maharashtra. An extensive work on birds has been carried out by Rahmani and Manakadan (1987) during BNHS's five year project on ecology and distribution of the Great Indian Bustard visited local area of Vaijapur and noted only presence of the Bustard.

One of the most spectacular events in the life history of numbers of birds is the migration, which has been intrigued mankind for many centuries. It is most enthralling subject of the study of birds life. Migration in perhaps its broadest sense, as defined by "a periodic passing form one place to another." Yardi, (2011), would add to this the concept of some correlation with environmental periodicities or some stage in the life history of the individuals making the migration. Others would limit its use to two way journeys of birds under their own power. An eminent authority, described bird migration as "changes of habitats periodically recurring and alternating in direction, which tend to secure optimum environmental conditions at all times" (Yardi, 2011). The clockwork regularity with which the arrivals and departure of migratory birds taken place every year, the countless millions of individual involved in this mass movement and the vast distances they travel over trackless land to reach their

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seasonal abode, have exited the wonder of man through the ages.

Migration is deep seated physiological phenomenon. It probably sprang from dispersal and retreat as cyclic ecological events took place and resulted in more efficient utilization of the environment which periodically becomes inclement or hostile.

Most of the migratory birds are seen within India only during the winter months, they arrive in autumn, chiefly between September and November, and leave again for their northern breeding grounds before our hot weather commences, in March or April. Among them are regular winter visitors both common and rare, and casual vagrants as well as accident strays. It is generally assumed and rightly so, that winter weather and the consequent scarcity of food, particularly insect, cause birds to seek more favorable climates for winter. Many theories have even advanced to explain the origin and perpetuation of migratory habit in birds. None of them is entirely adequate, probably there is no single factor or workable hypothesis explaining migration as a whole, which is presumably a phenomenon of multiple origins, but each contributes something to our understating of the problem involved (Pandya and Daniel, 2005).

Studies on bird populations are very important to understand the factors that influence the number of birds in a habitat and the comparative abundance of some species over the others. The number of individuals or pairs per unit area is known as the population density. Bird populations are quite stable and their densities fluctuate within a narrow range. If for some reason the density falls drastically the populations recovers very rapidly. This rapid recovery indicates that bird populations generally have a high potential to increasing numbers. This potential is not reached in natural populations. The main constraint to this potential is the carrying capacity of the environment which is related to the availability of resources. Food is the main limiting resource for many species while for other it could be nesting sites or territories.

Flocks are aggregation of birds which may come together for a variety of reasons. It may be merely by chance at a concentration of a resource they all want , it may be for large scale movements, better defend themselves against predators, or to improve their ability to get at, a scarce resource, or gain it may be to defend a common group territory against conspecifics. For instance, many insectivorous birds such as white eyes and minuets feed in flocks and larer mixed hunting parties including nuthatches, woodpeckers, drongos, mynas, tits etc. in our forests. Some species of babblers such as the common jungle, Large grey occur in small cohesive flocks which seem to defend group territories against other babblers, and have helpers who feed chicks at nests along with their parents. (Reena and Abhijit, 2005).

All studies of communal roosts in the Indian subcontinent have so far concentrated on resident birds (Sengupta, 1973; Gadgil and Ali, 1975) while a few have reported cursorily on roosting and movement pattern of migratory harriers (Rahmani and Manakadan, 1987; Satheesan and Rao, 1990). It is observed that many cities have made same mistake of neglecting

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their bird life and decreasing the biodiversity of birds very fast.

Hence, there is a need to set up the special committees of experts for protecting and improving of roosting, nesting and feeding habitat of birds. The most important and easiest way is to plant more and more trees to attract the bird life. Some pockets should be reserved and meticulously developed to nurture the bird species.

Birds have played a unique role in the growth of the conservation movement and the quest for a valid environmental ethics (Imnoden, 1994; Bock, 1997). Ornithologically based conservation efforts the information about birds can really be a public opinion (Bock, 1997). Bird populations provide a sensitive indicator of pollution in terrestrial ecosystems (Gaston, 1974). Ornithologists in particular are being asked by people to bring all that science can bring to bear on the conservation scene (Senner and Drennan, 1995). Moreever, Ornithologist is being asked to become advocates, not only for birds but also for their habitats and for all the diversity of life. Ornithologists historically played a key role in addressing environmental issues, because birds are highly visible and of interest to a large portion of the public, they often have served as focal points either in efforts to alleviate specific environmental problems, for example DDT's effect on Peregrine falcons or help to conserve entire ecosystems (Yardi, 2011).

Birds are part of the natural habitat of the Indian Subcontinent, a region teeming with winged resident. In India, there is no off-season for Ornithology, native birds more or less perennially visible. Migratory birds arrive annually for a winter vacation. The countryside is hot and dry in summer. The migratory birds in the lake seem to shrivel up. A good monsoon is rewarded by October. There is explosion in bird population by the beginning of winter. India and its neighborhood countries now play host to migratory birds. As the temperature falls in the northern latitudes, birds that have nested in the summer are unable to find food, they move south to more hospitable terrain. Birds are warm-blooded, egg-laying vertebrate covered with Feathers. The forelimbs are modified as wings, make them most strongly adapted for flying.

The food of the birds varies, not only in different birds, but also to some extent at different seasons. Some are vegetarians, feeding on the green parts of plants, and in these the intestine is usually long. Some are notoriously carnivorous, or feed upon fish, molluscs, insects, etc.

In India, much of the research work has been done in the fields of agriculture, horticulture and traditional forestry with regard to insect pests and their control. The vital importance of birds as biocontrol agents of insects and rodent pests has been long established. However, birds are more efficient as insect controllers due to their higher rate of metabolism (Tara Gandhi, 1995).

Studies of bird migration and distribution during the last several decades have emphasized questions related to the mechanisms and development (proximal causation) of migration, whereas questions related to the evolution and function (ultimate causion) of migration and distribution have received considerably less attention from ornithologists (Gauthreaux, 1979). The proximal

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causation bias has failed to emphasize the diversity of avian migration systems that have evolved as a result of temporal and spatial changes in the environment (Gauthreauz, 1982).

Bird habitats are strongly influenced by climatic changes and immediate human impact. When consequent environmental changes exceed the tolerance limits of species, habitat change could also become an ultimate cause for long-term changes in bird distributions. The changes in geographical distributions, both simple expansions of species' ranges, and the other an expansion in one direction coupled with a withdrawal from another, was seen to be mixed in the Salim Ali Lake (Auti, 2002).

Birds can be seen in various habitats such as terrestrial, aquatic, cold zone. High mountains on both poles streams to lakes and rivers. The Birds dependent on water are known as water birds. (Yardi, 2011). This includes birds like waterfowls, shore birds like waders. Some birds not fully depend on water but they always prefer the water body (wetland) such as Kingfisher Swallows, Pipits. Lapwing etc.

The area of wetland having sufficient water helps to increase the aquatic vegetation ultimately number of species of the water birds can be seen around wetland. Thus, this helps to increase the population and species of water birds and wetland dependent avifauna of that particular wetland. Such wetland provides food, shelter, resting places breeding grounds, roosting sites to variety of the birds (Anil Mahabal, 2005).

Water birds play a significant role in food chain. They play an important role in controlling agricultural pests also as destroyers of other vermin. As scavengers; as flower pollination agents, as seed dispersers, birds support the wetland ecosystem. Biodiversity is basic of sustainability of the diverse ecosystem give rise to diverse culture. However, the diversity of ecosystem life form, way of life of different communities are under threat, habitats have been eroded cutting and isolating biodiversity rich habitat into islands encourage the species isolation. Avain diversity is the part and parcel of biodiversity; therefore investigation on avian diversity and its bioecological aspects of birds is an essential pre-requisite for its conservation and further management (Anil Mahabal, 2005).

Jaykawadi wetland has been recognized a wetland of international significance (proposed Ramsar site). It is well known for its rich biodiversity, today this valuable natural asset is highly threatened due to the phenomenon of urbanization. The present study mainly focused on understanding the rate of wetland habitat using water birds as the biological indicator. Study of water quality with social survey supplemented by the results of statistical analysis of birds data helped to understand the issues regarding this wetland.

Jaikwadi Bird Sanctuary:

The present wetland Jaikwadi reservoir is situated 40 kms south of Aurangabad at Paithan. This town is situated on the right bank of river Godavari and is at latitude $19^0$39'19" north and longitude $75^0$26'2" east. The name itself shows Pratisthan or Capital city. Today, Paithan attains importance through the important pilgrimage of Sant Eknath Maharaj. In this river

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Godavari, the ashes of dead bodies are brought for spiritual performance.

Back water of Jaikwadi Dam "Nathsagar" has attracted a number of birds both resident and migratory. As per the criteria set in the Ramsar convention this water body holds migratory birds from all over the globe and their number exceed over 10,000. Migratory birds have been on record from Jaikwadi area as back as from 1976. In the year 1989 as many as 150 species of birds were recorded. Government of Maharashtra declared in November 1986 the area of Jaikwadi Reservoir as a bird sanctuary as per wildlife protection act 1972. The sanctuary is rich in bird fauna associated with it that includes some migratory species and ecologically an important landmark.

Steps to meet Management Goals:

The improvement in the quality of their habitats to attracts greater numbers of migrant birds such as ducks and waders. Many of these use mid-streak rocks for resting and roosting, feed in the open water or shallows nearby and also along the edges of reservoir. The shallow open water habitat is used by species for feeding. These include a number of migratory ducks. The main treat to this habitat comes from the spread of prosopus and Ipomia which tends to cover open water area. Its timely removal will benefit ducks and other species that use this habitat.

The use of the open water habitats by birds is also dependent on the quality of aquatic vegetation. The dominant aquatic plants communities found at present may be the result of increase fertility of water due to greater inflow of sewage. Their food value and use by birds need investigation. Once this information is available the managers can be selective in eliminating some vegetation in performance to some other species with better potential of birds use. Similarly vegetation at the edges of water also needs to be examined from the same point of view.

Besides ducks the other important group of migrants is waders. They feed in shallow water or in mud along the water's edge and some of them roost on the rock mid-stream. In the last few due to the maintenances of higher water level. Such mud-filled shallow areas have contracted. The manager can examine the edges of water to see if at places such areas can be created.

The second issue mainly concerns with resident birds. As already noted the activity of plantation on the bank has on the whole benefited the resident's birds. Several new species have been attracted though the activities. Proved inimical to the larger flocks of yellow wagtail that used the grass and scrub area plantation on the banks can be made more attractive to birds by planting more nectar producing flowers trees, more trees that produce berries and gradually eliminating exotic, quick growing trees that were planted simply because they grow very quickly.

A look at the habitats use of birds should convince the manger of the importance of meadows and shrubber species use these habitats for roosting while species seek food here. By studying the feeding habitats of these birds the manger can enhance the habitats usefulness to birds. Again certain species can be taken up. The need for a continuous study of birds should once again be emphasized.

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The proper management of meadows and scrubland will help birds such as partidges and quails and many attract other ground – nesting birds as well as birds that nest in shrubs. However, solitude and absence of disturbance are necessary to ensure breeding success. The manger will do well to keep certain pockets away from human disturbance. Likewise near the water's edge pockets of dense typha or other water side thickets will provide shelter and breeding place fir coot, Indian and Purple Moorhen etc.

At present number of breeding species is low and tree-nesting are fewer. But as the forest on the banks matures it may provide suitable place for some more species. However, between the sanctuary and the private estate. There is a buffer zone which provides the necessary solitude to nesting birds. This is not yet adequately planted up. If suitable nesting trees such as ficus, Acacia etc. are planted here, they may eventually provide nesting space to such colonial nesting as cormorants, Egrets, herons and storks. However, these will not breed unless adequate food is made available to feed their nesting. The managers should consult fisheries experts to enable him, to augment fish in waters.

The basic data that are presented here thus provide the manager a working base on which to build up his management practices. Continuous research on birds that are placed under this care will open up new vistas and suggest noel ideas that will enrich his experience and place near tools in his hands to reach management goals. His task becomes immensely easier if he is backed by a team of competent ornithologists. For the development of the science of birds Sanctuary Management, it is necessary to attract this unfettered biped who alone can study feathered bipeds.

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