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Biodiversity and Ecological Significance and Remedial Assessment of Sulwade Barrage, Irrigation Project, Dist. Dhule (M.S.), India

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Abstract: ***The project area is significantly developing reason and more productive due to Geographical feature, social aspect, environmental and climatic changes, different ecosystem in forest and largest irrigated area in Dhule District. The main aim of having EIA studies carried out is to understand and prioritize the impact of development activity on the natural life support systems and processes with main emphasis on the continuation of ecosystem processes and functions, so that adequate remedial/mitigating measures are taken right from the design stage.The great riverNarmada merely passes through the northern boundaries of the district and showering water on about 2,000 acres. Due to low rainfall and higher temperature forest type of the area is sub tropical thorny. The flora and fauna was very vibrant in rainy and winter season only while many of animals like birds, mammals, butterflies, reptiles. When ecosystem changes occur, a new pattern of biological activity and equilibrium is likely to emerge. The ecological change was happened at Tapiriver and in its tributaries, so this happens, a new and dynamic habitat formed as Cirrhinamrigala (Mrigal), Labeorohita(Roh.) and Catlacatla (Katla). The most of project are falls into desert of semi-arid climate that receives no more than a food of rainfall all year long, therefore migration is regular seasonal movement, often study area, undertaken by many species birds.***

Keywords: Remedial, Surwade, environment, dynamic habitat

1. Introduction

The Sulwade Barrage Medium Irrigation Project is constructed in the Tapi basin in Dhule district of Maharashtra. The constructive length of is 503 m long barrage with weir of the maximum height of 13m having 27 vertical lift gates each of size 15m x 11m across river Tapi near village Sulwade, Taluka Shindkheda in district Dhule. The gates are provided in the barrage is 405m to pass design flood of 49224m3/s at u/s HFL of 145.40m. there were no special canal system provided for this project, then also it showers 20 villages of Shindkheda Taluka and 11 villages in Shirpur Taluka in Dhule District. The lifting of water and its distribution will be done by the farmers through the co-operative and private lift irrigation schemes. 82.87% command area of this project lies in DPAP area. There are 8533 ha. Of land irrigated. This project provide 24.08 Mm3 water for domestic use and different scheme of drinking water. This also provide the water for industries and other developing sites like Nardane, Dhule, Shindkheda and Shirpur.

Tapi river flow to north-south direction near district, while the great riverNarmada merely passes through the northern boundaries of the district. The Tapiriver has a course of nearly 86 kilometresand receives many tributaries *viz.,*Aner, Baler, Arunavati and Gomai from the northern region of the district and Bori, Panjhara, Burai, Amravati, Shiva, Rangwal and Nesu from the southern region of the district. Besides there are 13 tanks which together provide water spread area of about 2,000 acres, of which the most important ones are Dedargaon (249 acres), Mukti (509 acres), Gondur (277 acres), Toranmal (200 acres), Shanimandal (219 acres), Purampada (66 acres) and Goathe (56 acres).

The workers may also cut trees to meet their requirements for construction of houses, furniture. Normally in such situations, lot of indiscriminate use or wastage of wood is also observed, especially in remote or inaccessible areas. Thus, it is necessary to implement adequate surveillance to ameliorate the adverse impacts on terrestrial flora during project construction phase same result was recorded by (Hegde, P., 1998).

Soil is very essential to assess the soil quality of the region for proper planning of a agriculture, a forestation or any other project. The quality of soil indicate “capacity of a specific kind of soil to function”. The basis data of soil classification done, overall complete project area with black basalt soil, it contain rich humus, this soil suitable for cultivation of cotton. Toranmal (200 acres), Shanimandal (219 acres), Purampada (66 acres) area include rocks, red soil and saline soil which make the soil infertile. Different characteristics of soil affect directly and indirectly on vegetation, agriculture, animals live in that area. Area like Toranmal (200 acres), Shanimandal (219 acres), Purampada (66 acres) has found very poor vegetation due to soil type. This observation is very much similar to (Singh, H. P., 2001).

The water ecosystem is affected by every activity that takes place on land as well as through our actions. The development of water resources has played a prominent role in the expansion of agriculture and agriculture related business in the Sulwade and (Dam Site). Geologically in this area, largely consists of igneous, metamorphosed rocks, black soil and saline soil associated with the Sulwade project plantation surfaces. The primary consumer of water in the Sulwade catchment area is irrigation. Now days the area of the Gorane, Warud, Thalner under irrigation increased steadily. Due to water source vegetation include all types of plants along with animals, birds, insects, reptiles microorganisms etc. all are supporting to balance the ecosystem.

The climate of Sulwade Barrage Medium Project, Dhuleand inMaharashtra is typically monsoonal in character, with 'hot' rainy and cold weather seasons. The months of March-April and May are of maximum heat. During this season, especially in April and May thunderstorms are a common feature all over the state. Vegetation in the Sulwade and (Dam Site) areas represent few thorny trees, herbs, shrubs along with certain grasses. Due to low rainfall and higher temperature the forest type of the area is sub tropical thorn type.

2. Material and Method

a) Random Opportunistic Sampling Method
Random opportunistic sampling of flora and fauna method were used for to study Sulwade Barrage Medium Project. Samples of flora and fauna were collected from different habitats in three different seasons like rainy, winter and summer since June 2011 and May 2012 at Surwade. Unique and unidentified specimens were collected for herbaria using dry method. The collections were brought to the laboratory after collection and for taxonomic studies important characters of the flora and fauna were studied as far as possible from fresh material and remaining material were preserved in 4% formalin for further studies. Photographs were taken on the spot as well as fresh material. Fresh specimens were identified with the help of regional, relevant monographs and recent available literature. Apart from primary data, we have also collected secondary data in terms of research papers published, interview and interaction with knowledgeable local people. This helped in a better understanding of the ecological sensitiveness of the region.

b) Herbarium:
Herbarium procedure were used for preserved plants specimens. These specimens are whole plants or plant parts, these are usually in a dried form mounted on a sheet but, depending upon the material, may also be kept in alcohol or other preservative. The specimens are stored for short time in the scientific way so, the specimens in a herbarium are often used as reference material in describing plant taxa.

c) Aquatic flora (Algae):
Algal materials were collected in specimen bottles. Filamentous form were collected with the forceps or by hand, while for phytoplankton forms surface water were collected between 8 to 9 Am., epiphytic form were collected by scraping or squeezing the hydrophytes. The collections were brought to the laboratory after collection, for taxonomic studies important characters of the taxa were studied as far as possible from fresh material and remaining material were preserved in 4% formalin for further studies. Camera Lucida sketches were made under proper magnification. Photographs were taken of some important taxa. Identification of the taxa was done with the different monograph of algae and relevant literature.

d) Specimen preservation
To preserve their form and color, plants collected in the field are spread flat on sheets of newsprint and dried, usually in a plant press, between blotters or absorbent paper. The specimens, which are then mounted on sheets of stiff white paper, are labeled with all essential data, such as date and place found, description of the plant, and special habitat conditions. The sheet is then placed in a protective case. As a precaution against insect attack, the pressed plant is frozen or poisoned, and the case disinfected.

Certain groups of plants are soft, bulky, or otherwise not amenable to drying and mounting on sheets. For these plants, other methods of preparation and storage may be used.

e) Collections management
Herbaria utilize a standard system of organizing their specimens into herbarium. Specimen sheets are stacked in groups by the species to which they belong and placed into a large lightweight folder that is labelled on the bottom edge. Groups of species folders are then placed together into larger, heavier folders by genus. The genus folders are then sorted by taxonomic family in herbarium cabinets.

Locating a specimen filed in the herbarium requires knowing the nomenclature and classification used by the herbarium. It also requires familiarity with possible name changes that have occurred since the specimen was collected, since the specimen were filed under an older name.

Systematic fauna surveys were undertaken at four survey sites, and other components of Area 1, Area 2/3 and Area 4 were inspected and observational surveys/bird counts were conducted. Surveys of wetland and shore birds were focused on a broader area to incorporate the study area and adjacent dredge spoil ponds, islands and tidal saline wetlands, to provide an assessment of adjacent terrestrial and mangrove habitats. Bird surveys within these additional areas included wader counts and observational surveys.

f) Fauna:

Live capture/release trapping:-Small mammals, amphibians and reptile were surveyed using a number of live tapering methods. Live capture and release methods tapering box for small mammals, wire cage traps for small medium sized mammals and pitfall traps with drift fences.

Hair funnels, scat analysis and signs:-Hair funnels were used as additional method. Hair funnel were baited and placed on the ground and in a rock crevices to target ground scansorial and mammals.

3. Result and Discussion

Environmental Impact Assessment (EIA) is a location specific study; with a common basic structure of understanding the baseline status of relevant environmental components and impact prediction due to proposed development. However, the process varies from project to project based on the location, type and magnitude of operations (Acton, S.T.,1996). EIA studies give emphasis on the assessment and prediction of impacts of development on natural ecosystems and their species along with concentrating on geophysical features, which mostly cover reversible impacts (Arce, R. N., Gullon, 2000). The main aim of having EIA studies carried out is to understand and

prioritize the impact of development activity on the natural life support systems and processes with main emphasis on the continuation of ecosystem processes and functions, so that adequate remedial/mitigating measures are taken right from the design stage.

Vegetation in the Varshi area and submergence of forthcoming and existing MI tanks is scanty and represented by few thorny trees and shrubs along with certain grasses. Due to low rainfall and higher temperature the forest type of the area is sub tropical thorn type (Champion and Seth, 1968). Out of estimated 17000 species of flowering plants in India, 5725 (33.5%) are found to be endemic to India (Nayar, 1996). The State of Maharashtra possesses some 3869 species including intra specific taxa of flowering plants (Singh and Karthikeyan, 2000). In all 457species under 57 families and Fabaceae is largest family of angiosperms and 25 species under 6 families of gymnosperms were recorded from study area and they are broadly classified as tree, herbs, shrubs and climbers, parasite, bamboo and grasses etc. Vegetation in the Shirale, Gavhane areas and submergence of forthcoming and existing MI tanks is scanty and represented by few thorny trees and shrubs along with certain grasses. Due to low rainfall and higher temperature the plants of the area is sub tropical thorn type (Champion and Seth, 1968).

Angiosperm families like Anacardiaceae, Apocynaceae, BellericMyrobalan, Bixaceae, Bombacaceae, Burseraceae, Burseraceaem, Caesalpiniaceae, Caricaceae, Celastraceae, Combretaceae, Ebenaceae, Euphorbiaceae, Fabaceae, Lamiaceae, Lecythidaceae, Leguminasae, Oleaceae, Phyllanthaceae, Pongamia, Rhamnaceae, Rhamnaceae, Rubiaceae, Rutaceae, Simaroubaceae, Sterculiaceae, Tilaceae, Ulmaceaeetc. are increase by 2.4 percent, while Santalaceae, Sapotaceae etc. decreased by 3.5 percent and Phyllanthaceae, Pongamia, Rhamnaceae, Rhamnaceae, Rubiaceaehas no change in number. The other major impact on the flora in and around the project area would be due to increased level of human interferences.

Table 1: Flora Recorded from Project Area during Year 2014 to 2015

Common Name	Botanical Name	Families
Trees		
Al	*Morindatinctoria*	Rubiaceae
Amba	*Mangiferaindica*	Anacardiaceae
Anjan	*Hardwickiabinata*	Caesalpiniaceae
Apta	*Bauhinia racemosa*	Caesalpiniaceae
Arjun Sadada	*Terminaliaarjuna*	Combretaceae
Asana	*Bredeliaretusa*	Euphorbiaceae
Awali	*Embilicaofficinalis*	Phyllanthaceae
Babul	*Acacia arabica*	Leguminosae
Bel	*Aeglemarmelos*	Rutaceae
Baheda	*Terminaliabelerica*	BellericMyrobalan
Bahava	*Cassia fistula*	Fabaceae
Bhondi	*Thespesiapopulnea*	Malvaceae
Bhavarsal	*Hymenodictlyonexcelsum*	Rubiaceae
Bhokar	*Cordiadichotoma*	Boraginaceae
Bhutakos	*Elaeodendronglaucum*	Celastraceae
Bibla	*Pterocarpusmarsupium*	Fabaceae
Bondara	*Lagersrtoemiaparviflora*	Lythraceae
Ber	*Zizyphusmaurtiana*	Rhamnaceae
Chandan	*Santalum album*	Santalaceae
Chinch	*Tamarindusindica*	Fabaceae
Dahi sag	*Cordiamacleodii*	Boraginaceae
Dhaman	*Grewiatiliafolia*	Tilaceae
Dhavda	*Anogeissuslatifolia*	Combretaceae
Ghaner	*Cochlospermumreligioum*	Bixaceae
Ghatbor	*Zizyphusxylopyra*	Rhamnaceae
Ghola	*Randiadumetorum*	Rubiaceae
Haldwan,	*Adina cordifolia*	Rubiaceae
Hiwar	*Acacia leucocephala*	Mimosaceae
Jambhul	*Syzygiumcumini*	Myrtaceae
Kala kuda	*Wrightiatinctoria*	Apocynaceae
Kalamb	*Mitragynaparvifolia*	Rubiaceae
Kakad	*Garugapinnata*	Burseraceae
Kanchan	*Bauhiriapurpurea*	Fabaceae
Kadai	*Sterculiaurens*	Sterculiaceae
Kansar	*Albizziaprocera*	Fabaceae
Karanj	*Pongamiapinnata*	Pongamia
Khair	*Acacia catechu*	Fabaceae
Kinai	*Albizziaprocera*	Fabaceae
Kusum	*Holarhenaantidysenterica*	Apocynaceae
Kumbhi	*Careyaarborea*	Lecythidaceae
Maharukh	*Ailanthus excelsa*	Simaroubaceae
Mahua	*Madhucaindica*	Sapotaceae
Medsing	*Dolichandronefalcata*	Bignoniaceae
Modhal	*Lanneacaromandelica*	Anacardiaceae
Mokha	*Schreberaswietenioides*	Oleaceae
Nilgiri	*Eucalyptus sp.*	Caricaceae
Nimb	*Azadirachtaindica*	Meliaceae
Nimbhara	*Meliadubia*	Meliaceae
Phasi	*Dalbergiapaniculata*	Leguminasae
Palas	*Buteamonosperma*	Fabaceae
Papri	*HoloptleaIntegrifolia*	Ulmaceae
Pangara	*Erythrinavariegata*	Fabaceae
Patri	*Trewianudiflora*	Euphorbiaceae
Pimpal	*Ficusreligiosa*	Moraceae
Prosopis	*Prosopisjuliflora*	Fabaceae
Rohin	*Soymidafebrifuga*	Meliaceae
Sadada	*Terminaliatomentosa*	Combretaceae
Salai	*Boswelliaserrata*	Burseraceae
Sawar	*Salmaliamalabarica*	Bombacaceae
Shendri	*Mallotusphilippinensis*	Euphorbiaceae
Shewaga	*Moringatomentosa*	Euphorbiaceae
Shiras	*Albizzialebbeck*	Fabaceae
Son Khair	*Dalbergialatifolia*	Fabaceae
Shivan	*Gmelinaarborea*	Lamiaceae
Tombhrun	*Diospyrosmelanoxylon*	Ebenaceae
Tiwas	*Ougeiniaooginensis*	Fabaceae
Umber	*Ficusglomerata*	Moraceae
Wad	*Ficusbengalensis*	Moraceae
Shrubs		
Amoni	*Rhusmysorensis*	
Arati	*Mimosa hamata*	
Ganori	*Lantana camera*	
Henkal	*Gymnosporiamontana*	
Kanhor	*Zizyphusoenoplia*	
Karvi	*Strobilanthuscallosus*	
Karwand	*Carrisacarandas*	
Kovani	*Holicteresisora*	
Kirmira	*Glycosmispantaphylla*	
Nirgudi	*Vitexnegundo*	
Niwadung	*Thespesialampus*	
Rui	*Calotropisgigantea*	
Tarwad	*Cassia auriculata*	

Thor	*Euphorbia ligularia*	
Thorani	*Zizyphusrugosa*	
Yellatur	*Dichrostachyacinerea*	
Herbs		
Chivani	*Ensetesuperbum*	
SafedMusali	*Aspergusadscondena*	
Tarota	*Cassia tora*	
Chirchira	*Achyranthusaspera*	
Climbers		
Chilhar	*Caesalpiniasepiaria*	
Deolas	*Combretumovalifolium*	
Nandvel	*Cissusrepanda*	
Sagargota	*Caesalpiniabonducella*	
Ukshi	*Calycopteris floribunda*	
Parasites		
Bandgul	*Loranthusagenifed*	
Bamboo		
Manvel	*Dendrocalmusstrictus*	
Grasses		
Anjan	*Cenchrussetigerus*	
Bhongrutphulora	*Themedaquadrivalvis*	
Bhuri	*Aristidapaniculata*	
Boru	*Sorghum halepense*	
Gondvol	*Andropogonpertusus*	
Kunda	*Ischaemumpilosum*	
Kusali	*Heteropogoncontortus*	
Lavhale	*Mnesithealeavisgranularis*	
Marvel	*Dicanthiumannulutum*	
Pavanya	*Sehimanervosum*	
Phuli	*Apludamutica*	
Rosha	*Andropogonschoenanthus*	
Sheda	*Ischaemumlaxum*	

4. Faunal Diversity

Butterfly: There are fourteen species of butterflies found in this area belonging to three families, family Nymphalidae is dominated by 7 species followed by Lycaenidae 2 species, Pieridae 1, Papilionidae 2 species and Hesperiidae one species. Two endangered species namely Crimson rose and Danaideggfly were recorded in winter at this region, emphasising the ecological significance of the region. Many species are found mud-pudding close to the streams and some species are basking in the open canopy areas. Whether they are flowering plants or peaceful woodland, many habitats can be managed to attract butterflies and moths (Saldanha C. J.; D. H. Nicolson., 1978) same habitat were observed in study area. There were no butterflies recorded in summer.

Dragonflies: Three species of Odonates are found in this area. The three species are found along the streams of Hongadahalla, Battekumrihalla and Kempholé whereas, the *Diplocodestrivailis*is found in the forest undergrowth of Hongadahalla area. Area in or near a permanent water source with a stable surrounding environment. marshy land clean and cool running waters and unpolluted areas (Valdiya, K. S. 2001).

Fishes: Random surveys were carried out in selected river Tapi and its tributaries for assessing the diversity of fishes. From the three samplings, we recorded eight families of includes fifteen species individuals. Out of these 15 species 6 are endemic to the project area. Majority of fish recorded at Tapiriver. The family- Cyprinidae is lagest family include eight species like *Oxygasterclupeoides* (Bl.), *Rasboradaniconius* (Ham.), *Puntiussarana* (Ham.), *Cirrhinamrigala* (Ham.), *Labeocalbasu* (Ham.), *Labeorohita* (Ham.), *Catlacatla* (Ham.), *Garramullya* (Sykes) recorded in Tapi river except *Catlacatla* (Ham.). *Family-Cobitidae*, *Heteropneustidae*, *Siluridae*, *Bagaridae*, *Ophiocepuaudae*, *Goblldaeand Cyprinodoniidae* was recorded in Tapi river as well as its tributaries. This observation is very similar to(Dutta, P.N.**;** B. Lahon. 1987; Das, A.; Krishnaswamy, J.; Bawa, K.S.; Kiran, M.C.; Srinivas, V.; Kumar, N.S.;Karanth, K.U., 2006).

When ecosystem changes occur, a new pattern of biological activity and equilibrium is likely to emerge. The ecological change was happened at Tapi river and in its tributaries, so this happens, a new and dynamic habitat formed as *Cirrhinamrigala* (*Mrigal*), *Labeorohita*(*Roh.) and Catlacatla (Katla)* . With this new equilibrium comes changes to fish that populate these areas.

Amphibians: Amphibians are one of the best biological indicators of ecosystem health. In the present study, opportunistic surveys were carried out in Gorane, Warud, Thalner area. This region being biologically rich and As many as 7 species were observed from the region. In the present study, two endangered species *Nyctibatrachusaliciae* and *Minervaryasahyadris* were recorded in summer, Availability of perennial sources of water has provided ample habitats for amphibians; hence they are persisting in this region even during non-monsoon periods (our sampling period). This observation habitat is very similar to (Gehrke, P. C.; Harris, J. H.,1996; Sarma, J.1993) also observed same habitat of amphibians.

Mammals: Mammals are one of the best factors of biotic ecosystem. In the present study, opportunistic surveys were carried out in Gorane, Warud, Thalner area. There were 7 species of mammals recorded like Mungose, Ran manjar, Sasa, Nilgai and Sambhar. (Asokan, S., 1995).

Reptiles: In the present study, opportunistic surveys were carried out in Sulwade and (Dam Site) area, there are nine species of reptiles observed. CommanKarait, Forest calotes, Common skink, Saw scaled Viper, Russells Viper, Indian Cobra, Rat Snake, Garden Lizard, House gecko, Tricarinate skink were sighted in the Sulwade and (Dam Site) area. (Table ---). (Ali, S.A.; Vijayan, V.S.; 1986). Most of reptiles recorded in winter and summer.

Most of the study area falls into the desert or semi-arid climate section meaning that it receives no more than a foot of rainfall all year long. The soil is not rich in nutrients and over half of the days are sunny with no clouds. There is a large variety of snakes in this area, like *Najanaja*(Indian cobra) *and Pytasmucosus*(rat snake).

Birds: Twenty-five species of birds were recorded by the method opportunistic sampling in all three season like rainy, winter and summer at the Shirale, Gavhane, Varshi, Daswel, HolP.b., Gorane, Warud, Thalner and Sulwade and (Dam Site) area. Crow pheasant, House crow, Indian jungle crow,

Black dongo/ King Dongo, Koel, Indian Myna Little brown dove/ senegal dove were observed near village area, while in dense Dabhashi area Black winged kite, Common Pariah Kite, Green Bee Eater, Ashycrowned finch lark, Rufous tailed finch lark, Wiretailed Swallow, Rofousbacked shrike and Bay backed shrike, Golden oriole, Redvened bulbul, Rufousbellied babbler, Ashy wren warbler, large pied wagtail, Indian robin, Indian House sparrow were found in the Semi-evergreen township areas of Sulwade. (Ali, S.; S. D. Ripley, 1998) also observed same habitat of birds.

Migration is the regular seasonal movement, often study area, undertaken by many species of birds. Bird movements include those made in response to changes in food availability, habitat, or weather. Birds like *Priniasocialis, Motacillamaderaapatensis and Saxicoloidesfulicata* are found during early morning and evening on the bank of Tapi river as well as Brahminy Ducks are also seen in this area.

Total 2: Mammals species have been recorded during biotic survey

Local Name	*Scientific Name*
Mungose	*Herpestesedwardsi*
Ran manjar	*Felischaus*
Sasa	*Lepusnigricolis*
Nilgai	*Boselaphustragocamelus*
Sambhar	*Cervus unicolor*

Table 3: Reptiles found in Study Area

Local Name	*Scientific Name*
CommanKarait	*Bungaruscaeruleus*
Forest calotes	*Calotescalotes*
Common skink	*Mabuyadesimilis*
Saw scaled Viper	*Echiscarinatus*
Russells Viper	*Viperarusselli*
Indian Cobra	*Najanaja*
Rat Snake	*Pytasmucosus*
Garden Lizard	*Calotesvesicolor*
House gecko	*Hemidactylusflavivirdis*
Tricarinate skink	*Mabuyatricarinata*

Table 4: Avi-fauna found in Study Area

Local Name	**Scientific Name**
Crow pheasant	*Centropussinensis*
House crow	*Corvussplendens*
Indian jungle crow	*Corvusmacrorhynchos*
Black dongo/ King Dongo	*Dicrurusadsimilis*
Indian Myna	*Acridotherestristis*
Little brown dove/ senegal dove	*Streptopeliasenegalensis*
Little urget	*Ergettagarzetta*
Cattle urget	*Bubulcus ibis*
Short toed Eagle	*Circaetusgallicus*
Black winged kite	*Elanuscaeruleus*
Common Pariah Kite	*Milvusmigransgovinda*
Koel	*Eudynamysscolopacea*
Green Bee Eater	*Meropsorientalis*
Ashycrowned finch lark	*Eremopterixgrisea*
Rufous tailed finch lark	*Ammomanesphoenicurus*
Wiretailed Swallow	*Hirundosmithii*
Rofousbacked shrike	*Laniusschach*
Bay backed shrike	*Laniusvittatus*
Golden oriole	*Oriolusoriolus*
Redvened bulbul	*Pycnonotuscafer*
Rufousbellied babbler	*Dumetiahyperythra*
Ashy wren warbler	*Priniasocialis*
large pied wagtail	*Motacillamaderaapatensis*
Indian robin	*Saxicoloidesfulicata*
Indian House sparrow	*Passer domesticus*

Table 5: List of common fishes of commercial importance found in study area

Scientific Name	**Local Name**
Family-CYPRINIDAE	
Oxygasterclupeoides (Bl.)	*Salpe.*
Rasboradaniconius (Ham.)	*Dandaonya.*
Puntiussarana (Ham.)	*Bodhad.*
Cirrhinamrigala (Ham.)	*Mrigal.*
Labeocalbasu (Ham.)	*Kalti.*
Labeorohita (Ham.)	*Rohu.*
Catlacatla (Ham.)	*Katla.*
Garramullya (Sykes)	*Malya.*
***Family-COBITIDAE* (Loaches)**	
Noemacheilusbotia: (Ham.)	*Mura,Muri.*
***Family-HETEROPNEUSTIDAE* (Catfishes)**	
Heteropneustesfossilis (Bloch)	*Nar-Shingali.*
***Family-SILURIDAE* (Catfishes)**	
Wallagoattu (Schn.)	*Daku,Padin.*
***Family-BAGARIDAE* (Catfishes)**	
Mystusvittatus (Bl.)	*Tengra.*
Mystuscavernitis (Ham.)	*Shingti.*
***Family-OPHIOCEPUAUDAE* (Snake headed fishes)**	
Channastriatus (Bl.)	*Murral.*
Family-GOBllDAE (Gobies)	
Glossogobhisgiuris (Ham.)	*Kharbi.*
Family CYPRINODONIIDAE	
Panchaxlineatusdayi (Steindachnev)	*Piku.*

5. Impact of Flora and Fauna on Ecosystem

We can't live without flora and fauna. The flora of the earth produce the oxygen that is breathed by the fauna and in turn, the fauna exhale the carbon dioxide that the flora need to live. In the study area many animals are depends on the shrubs, grass as well as tress, but due to scarcity of water, less rainfall and mismanagement of forest administration, there are less population of flora, so that some of the animals moving away from their habitat, it shows the bad impact on environment, it is understood that, one cannot live without the other, and humans cannot live without either; hence their flora and fauna are importance for ecosystem. This negative impact on the ecosystem observed in late winter and summer season. Same result recorded by Chakrabarty, R. D., P. Roy and G. K. Singh. 1957-59.

The ecosystem created by the interdependence of these two life forms is not simple at all. In fact, humans cannot breathe unless both flora and fauna survive and thrive on the earth. In this study area more human population and its business farming, sheep faming, poetry farming etc., all of them needs food and it get from the forest, people are taking many thing from the forest but not returning it in balance, so the ecosystem of this area has been changed, shows bad impact on the environment. The very air we breathe and the food we eat, the medicines that cure us, and the water that keeps us alive would not exist were it not for flora and fauna. All things in an ecosystem are interdependent.

The existence of mammals like Mungose (Herpestesedwardsi), Ran manjar (Felischaus), Sasa (Lepusnigricolis), Nilgai (Boselaphustragocamelus) etc. species are depend on the health of another, such as the relationship with herbs, grass, snack, mouse. Mammals eat tress, herbs, grass, snack, mouse, so the destruction of the food web in the study area, resulted in the endangerment of the area, due to starvation and loss of habitat.

The existence of one species may depend on the health of another, such as the relationship of trees to camels. Camels only eat tall trees shoots, so the destruction of the trees in the study area, resulted in the endangerment of the area, due to starvation and loss of habitat. In study area, destruction of the forests left the wild animals with no place to go. Farmers killed them in great numbers to protect their farm animals, and soon there were few left. In an attempt to save the species.

In study area wild animals were moved to the villages, where they are surviving nicely. All animals, plants, microorganism and human beings are interrelated to each other, once get destruct, whole ecosystem will get collapse, finally bad impact comes on ecosystem.

Aquatic plants grow partially or completely in water. As with other plants, they require light and carbon dioxide (or other inorganic carbon source) for photosynthesis, oxygen for respiration, water, and nutrients such as nitrogen, phosphorus and others. Plants that grow with emergent or floating leaves form some of the most productive communities in the study area, because they are rarely limited by water availability. With leaves exposed to the air, they have a ready source of light, carbon dioxide and oxygen. As a rule, submersed plants, however, are much less productive. Light energy is rapidly attenuated as it penetrates the water, light intensity is more and it is good for the for submersed plant growth.

Carbon dioxide and oxygen must be acquired from the water, or stored in the plant stem, with the consequence that it is much more limiting to submersed plants than to emergent species. Diffusion is slow through water, further reducing plant growth rates. Plants rooted in the bottom typically have a ready source of nutrients such as nitrogen and phosphorus. Algae and free-floating plants, however, must acquire nutrients from the water column, which can likewise limit their growth.

The depth limitation of aquatic plants is controlled by light penetration through the water column. While plants may grow only 3 m deep in productive, eutrophic waters, in oligotrophic waters they may grow to depths of 2 m or more, with bryophytes found at a depth of over 0 m in study area. The strong gradient of light energy also creates a natural zonation of aquatic plants in lakes, with communities stratified by depth. This natural 'depth zonation' is a common feature of aquatic plant communities worldwide. Marine plants and macro-algae are also depth-limited by light availability, but the depth range for these habitats is even greater. Marine algae have been found at depths of 2m. Freshwater macrophytes (plants and algae) form a critical habitat for other aquatic organisms; a substrate for attached plants and animals, spawning areas for animals, nursery areas for young fish and other biota and habitat for adult life stages. In addition, they form the base of the food chain as either a direct food source, or as detritus matter after plant death.

TavkhedeP.b. area near the field having large number of population of aquatic flora, there is big algal blooms, submerged plant and microorganism were recorded, this happened due to big source of nutrients, nutrients are the component of ecosystem, so plenty of nutrients source are good for the ecosystem. There for this TavkhedeP.b. is good habitat for aquatic flora and fauna, and also complete food web of ecosystem, meance shows good impact on ecosystem.

6. Conclusion

This region harbors many endemic and endangered species. Nearly 5% of the plant species are endemic to TavkhedeP.b. area, similarly among animals 35% amphibians, 60% fishes are endemic. More importantly, the presence of four critically endangered and 14 endangered animal species in the region emphasises the unique habitats and ecological niches provided in first reason for these animals. This was also observed that all the flora and fauna was very vibrant in rainy and winter season only while many of animals like birds, mammals, butterflies, reptiles was observed to migrate on new habitat, so it is also concluded that the study area has very less impact of dams in summer.

Biodiversity through time and space has provided the panorama of the genesis and diversification of various life forms, their interdependence, and link between life and life support systems, triggering a holistic approach to knowledge-building focused on various aspects of human affairs. These areas have already lost vast area of virgin forests as evident from barren hill tops, seasonal streams, local extinction of species, etc. with many still existing as revenue lands waiting to be logged and gone for ever. Unplanned developmental activities in the region will further diminish the biodiversity (most importantly to the endemic and endangered species), hydrology and ecology of the region. It is high time for us to understand nature, its importance for our sustainable living and for future generations to come and take Wright decisions to improvement of study area and inundate the natural resources forever.From the available data, the average annual runoff is less than the average rainfall over the TavkhedeP.b.. The reason for this is either that the runoff is over estimated or the rainfall is very sparse and not a true representation of the mean precipitation over the Gorane, Warud, Thalner. studies have been done ecological pattern in the study area which have concluded that there is high spatial variability in the forest and for most Gorane, Warud, Thalner, it is observed that the ecological web cycles brokered due to environmental disturbance.

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