BIODIVERSITY OF DOLUCHARI VILLAGE COMMON FOREST IN RANGAMATI

Principal Investigator
Mohammed Mostafa Feeroz

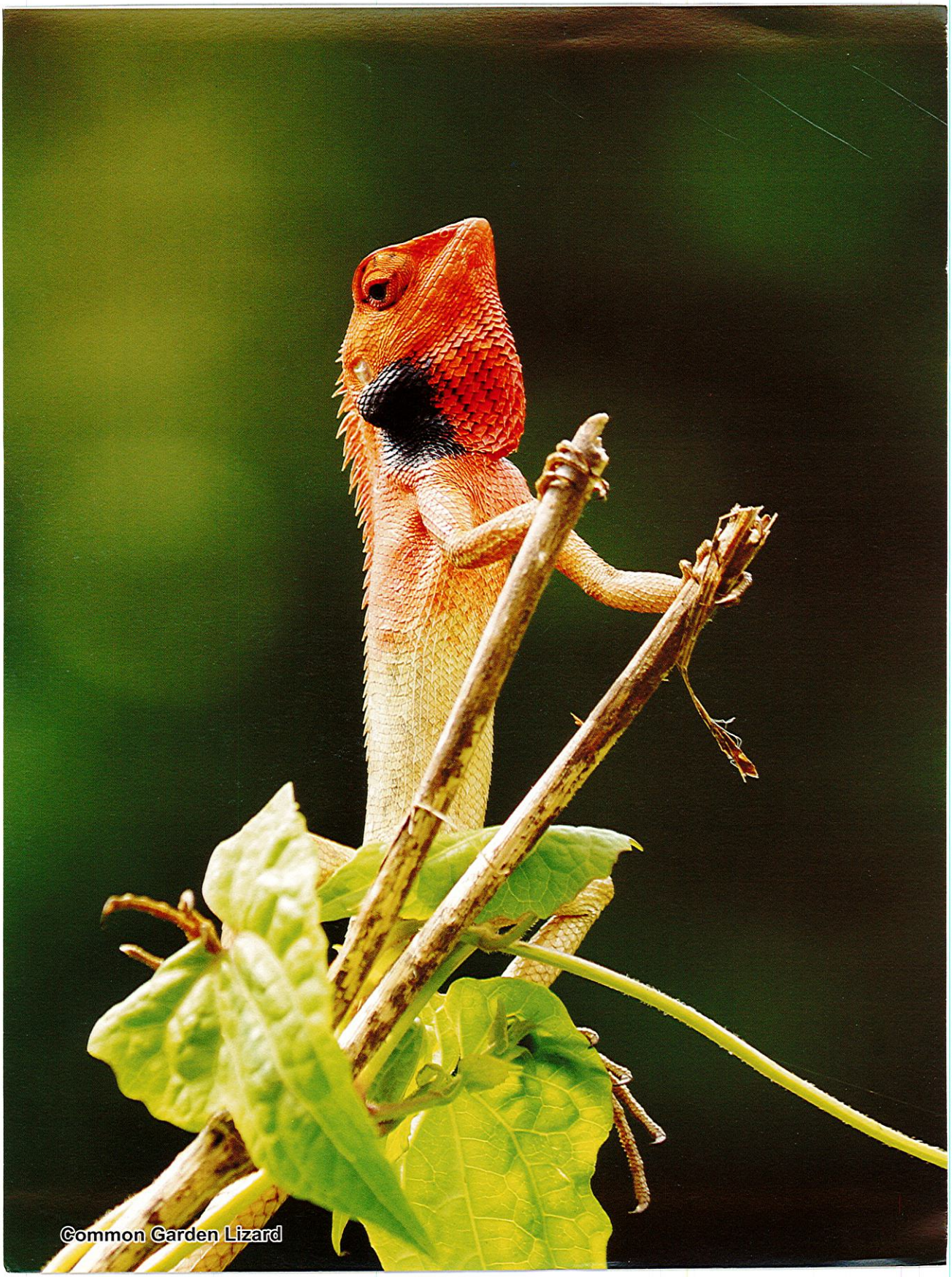
ARANNAYK FOUNDATION
Conserving forests for the future

WRC
Wildlife Rescue Centre
Jahangirnagar University

Arannayk Foundation (AF) also known as Bangladesh Tropical Forest Conservation Foundation, is a not-for-profit organization established by the joint initiative of the Government of Bangladesh and United States of America in response to the state of depletion of tropical forest resources. AF's mission is to facilitate the conservation, protection, restoration and sustainable use and management of tropical forest in Bangladesh, which provide a wide range of benefits to mankind. It works with public, NGO and private sector partners, and provides financial grants and/or other supports to qualified organizations or entities engaged in or promoting conservation, protection, restoration and management of tropical forests and biodiversity assets of Bangladesh. AF is managed by an independent seven-member Board of Directors, which includes one representative of the Government of Bangladesh, one representative of the Government of USA and five members from relevant civil society organizations.

Wildlife Rescue Centre (WRC) is the field laboratory of the Wildlife Research Group, Department of Zoology, Jahangirnagar University, Bangladesh. Since 1990, the researchers of this group have been involved in systematic research on different aspects of wildlife ecology, behaviour and conservation in Bangladesh. Recently the group expanded its research activities on wildlife population genetics (first of this kind of research in Bangladesh) and zoonotic disease. Both these activities are in collaboration with Primate Research Institute of Kyoto University, Japan and The Primate Research Centre of University of Washington, Seattle, USA respectively. Two hundred fifty scientific publications and twenty four books have been published by the members of this group. Several research projects have been completed by the researchers of this group which were funded by National Institute of Health (NIH) USA, ADB, GEF, World Bank, GIZ, FAO, WWF, IUCN, US Fish and Wildlife Services, USAID, ZSL and MOSICT- Bangladesh. The largest open access database on biodiversity of Protected Areas of Bangladesh (BioTrack) is also developed by this group.


Black-naped Monarch


Common Garden Lizard

Biodiversity of Doluchari Village Common Forest in Rangamati

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HILL FLOWER

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This book is published as an outcome of the biodiversity monitoring by the Wildlife Research Group, Department of Zoology, Jahangirnagar University funded by Arannayk Foundation

Dedicated to
The local people living around Doluchari VCF, whose efforts make it an oasis for the wildlife of this region

Comments and suggested edits may be sent to the lead author at feerozmm@yahoo.com

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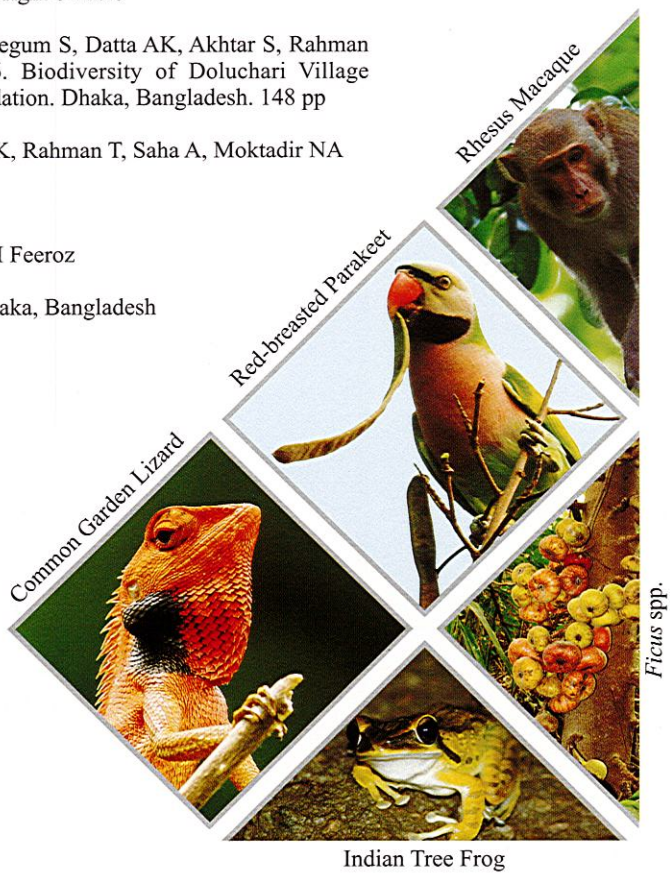

Foreword

Arannayk Foundation has been promoting conservation of Protected Areas (PA) and community conserved areas since its inception. The Village Common Forests (VCF) of Chittagong Hill Tracts are community conserved areas. The local people of Chittagong Hill Tracts (CHT) have been conserving VCF to have sustained supply of water and some forest resources (mainly bamboo and timber) for their household needs. The harvesting from the VCFs is regulated through application of customary rules by the traditional leaders of the indigenous communities. Though there is no systematic survey of the VCFs, it is assumed that there are more than 300 VCFs in three hill districts of Chittagong Hill Tracts. The size of VCFs ranges from 20 ha to more than 400 ha. The VCFs are rich in flora and fauna but due to increased population pressure, the VCFs are under threat of deforestation.

Arannayk Foundation has been monitoring the floral diversity of selected VCFs through its partner NGOs. Information on faunal diversity was mostly qualitative, based on communities' perception. The recent study on biodiversity of Doluchari VCF in Rangamati Hill District by Arannayk Foundation in collaboration with the Wildlife Research Group (WRG), Department of Zoology, Jahangirnagar University reveals that the biodiversity of the Doluchari VCF is extremely rich. The study was comprehensive covering both flora and fauna. The faunal study was led by Prof. Dr. Mohammed Mostafa Feeroz of Zoology Department, Jahangirnagar University. The collected flora from DVCF was identified by both Prof. Dr. M. Kamal Hossain of the Institute of Forestry and Environmental Sciences, Chittagong University and Prof. Dr. Md. Zashim Uddin of the Department of Botany, Dhaka University.

The photographs used in this book are taken by the WRG team members during the field work in DVCF. The study reveals the existence of many more wildlife species that could not be possible to document in only the year-long study using camera traps at night and trail visits (for sighting and photography) during day time. Furthermore, it demands continuous study for a more detailed listing of faunal diversity. This publication will give an impression of richness of biodiversity of the Chittagong Hill Tracts.

We must conserve all VCFs of the CHT and develop a mechanism of incentivizing local communities for their purpose. Arannayk Foundation has limited financial resources but we encourage other development partners including government agencies to join hands with Arannayk Foundation and save our forests not only for biodiversity but also for sustained supply of water in the Chittagong Hill Tracts.

Thanks to Prof. Dr. M.M. Feeroz and his WRG team, as well as Prof. Kamal Hossain and Prof. Md. Zashim Uddin for their effort for this study. Thanks to our field partner Hill Flower and its Executive Director Dr. Nilu Tanchangya for their support in the field. We are also grateful to Nishi Mohon Chakma (President, DVCF committee), Noborjit Chakma (member, DVCF committee), Amor Kumar Chakma (Karbari, Keretkata), Amor Shanti Chakma (Karbari, Baradam) for allowing the WRG team to study in DVCF and supporting in every aspect. We are also thankful to Shomor Chakma and his family for allowing WRG team to stay night during field work and for assisting as local guide with the team.

Farid Uddin Ahmed
Executive Director

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Unidentified higher fungi

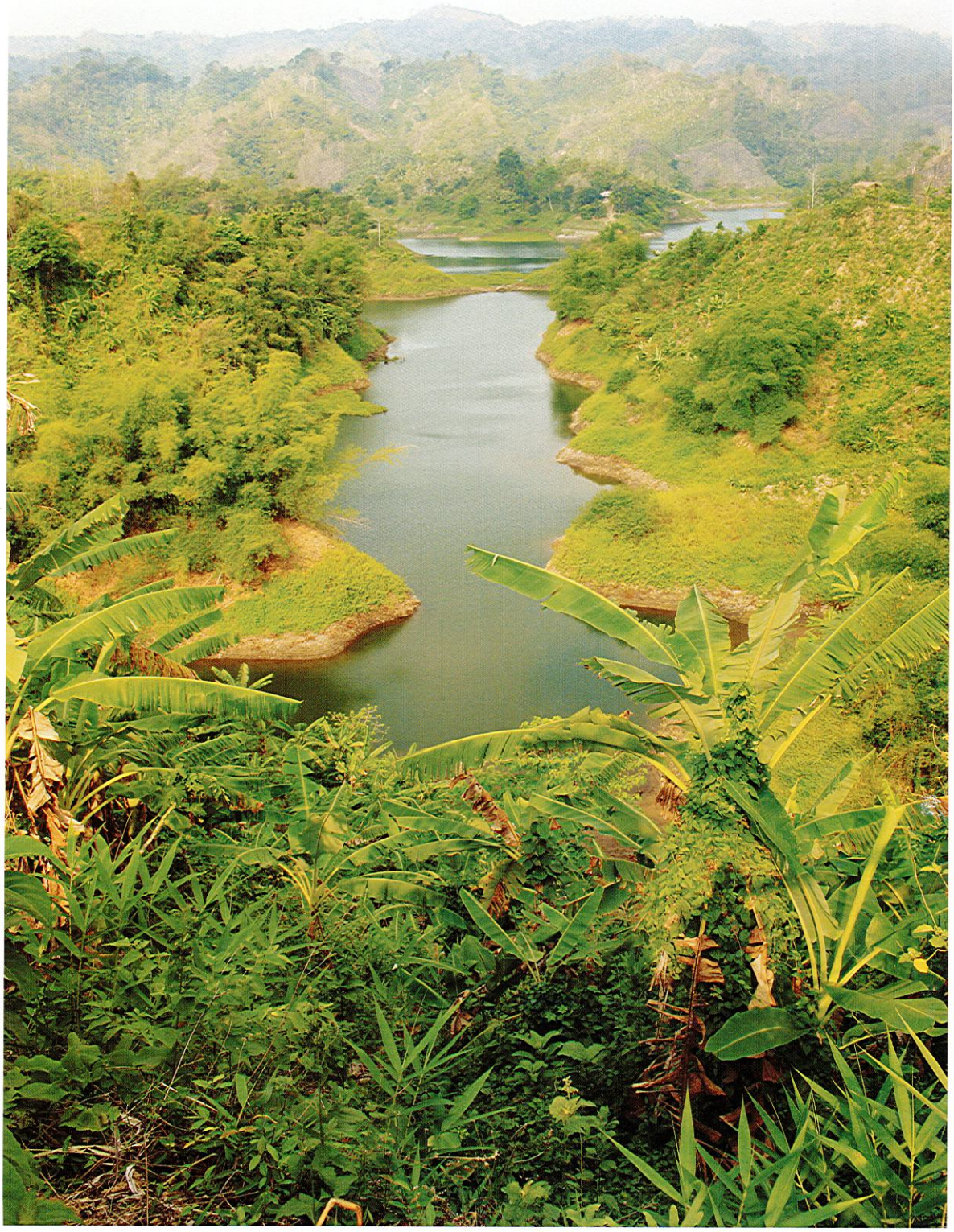
Periphery of DVCF

CHAPTER 1
INTRODUCTION

1.1 Village Common Forest (VCF)

Village Common Forests (VCFs) are generally regarded as natural small forest ecosystem with complex network of small watersheds mostly characterized by significant biodiversity of diverse plants and animals and cultural values which are traditionally conserved by indigenous and local communities in the Chittagong Hill Tracts (CHT). In a word, VCFs are treasure houses of rich biodiversity that support the entire indigenous community livelihood and make balance between resource utilization and conservation.

In the Chittagong Hill Tracts, these community managed forest areas were locally known as *mouzaban* or *mouza* forests.



VCF is an effective community managed forest management system, which is introduced to the indigenous people under certain traditional rules and regulations. Therefore, VCF fulfills the environmental and cultural needs of the indigenous communities in a sustainable way while playing an important role in biodiversity conservation. VCFs are managed as common property resource by the surrounding forest villagers under the leadership of Mouza Headmen where jhuming is not allowed. The community themselves decide the timing and type of harvest from VCF to fulfill their basic needs.

1.2 History

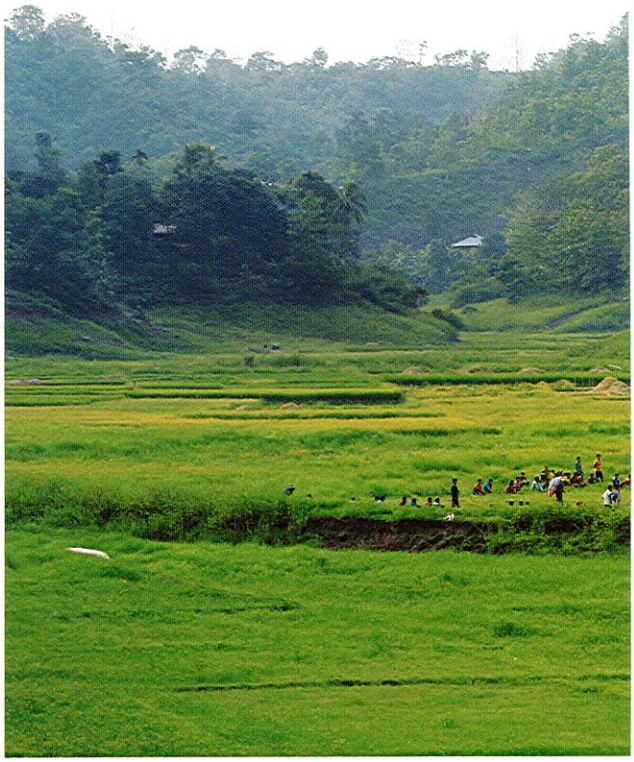
The idea of Village Common Forests (VCFs) is not well conceived in Bangladesh. However, many local indigenous communities in different parts of the country have been conserving the natural resources in relation to their traditional, cultural or religious practices for decades. Several methodical comprehensive studies on the status and management of existing VCFs are

Hill forest around the lake in Rangamati

Khagrachari town and its surrounding hill forest

documented though the study on socio-economically important resource bases including biodiversity significance is poor. Once there were many forest tracts and wetland patches in almost every village throughout the country. These village forest networks were found in the *khas* land (Government owned fallow land) or in *waqf* (The Muslim practice of endowing property to a religious institution) estates until the third quarter of 20th century. Local communities used to manage these village forests and the natural resources of traditional, cultural or religious importance; in addition, they had the legal rights to these village forests. However, the local people may be unaware of or lacking knowledge of the ecological importance of biodiversity at earlier, but the communities traditionally conserved these village forests containing rich biodiversity. On the other hand, VCFs in the Chittagong Hill Tracts (CHT), characterized by hilly topography, are still considered as one of the richest forest areas of Bangladesh which support almost 80% of the country's total biodiversity (Nishat & Biswas 2005), and is inhabited by almost 12 indigenous or ethnic communities (Roy 2000, Rasul 2007, Rasul & Thapa 2006, Miah & Chowdhury 2004, Chowdhury & Miah 2003, van Schendel *et al.* 2001, Nasreen & Togawa 2002) who depend largely on forest resources to fulfill their basic requirements and earning cash (Rasul & Karki 2006, Rasul 2007). The area is unique for its indigenous culture, lifestyle and livelihood which are mostly related to forest and forest resources.

During the last quarter of 19th century (1871-1885), three-fourths land of the CHT has been declared as government forest land by the British colonial government and the remaining areas were declared as 'khas land' (government owned fallow land, where nobody has property rights). These remaining areas exclude some privately owned land those are obtained through leasehold or freehold (Rasul 2007). Subsequently, Reserved Forests (RFs) containing one fourth of the government forest lands (1,345 sq km) were declared, where any rights of indigenous people were totally prohibited.



Hill forest in Sajek Valley

Paddy fields in the valleys are also used by the local people for amusement, during the dry season, while these are submerged during rainy season

Afterward, the government declared the rest of the government forests as Unclassed State Forest (USF), where indigenous peoples' customary rights (collection of fuel wood, fodder and jhuming or shifting cultivation) are allowed (Ibid.). The members of the neighboring community have equal rights over the resources of these common forests under certain rules and regulations. For many years, the indigenous communities have managed the forests in a sustainable way by keeping the rotation of their shifting cultivation long enough (15 - 20 years) (Roy 1998, Rasul & Thapa 2003, Tiwari 2003, Baten *et al.* 2010). In 1939, there was a significant change in the management of USF as a new policy of conservation in USF was introduced through the amendment of rule 41 of the Regulation 1900. This rule 41 empowered the Deputy Commissioner of the CHT to regulate and control jhum cultivation and the migration of jhum cultivators from one Mouza to another, and also included provisions for a Mouza Reserve under headmen. Headman of each Mouza has given power to manage the forest within the Mouza to raise and conserve VCF (Chowdhury 2014). During the last few decades, indiscriminate exploitation of natural forest resources has led to the tremendous loss of biodiversity as well as widespread degradation of the overall forest ecosystems as a whole. This results resource destruction and therefore, the indigenous communities suffered shortage of forest resources. In this crucial period, government has initiated various policies and many development programs for forest dependant local or indigenous communities in the CHT. However, the initiatives were not so much effective or successful in attaining the objectives to meet livelihood demands of indigenous people. Without any other alternatives to safeguard forest resources and to improve the livelihood security, indigenous people have started to practice forest resource management pattern more traditionally and hence the Village Common Forest (VCF) which becomes visible to everyone as an alternative means of biodiversity conservation.

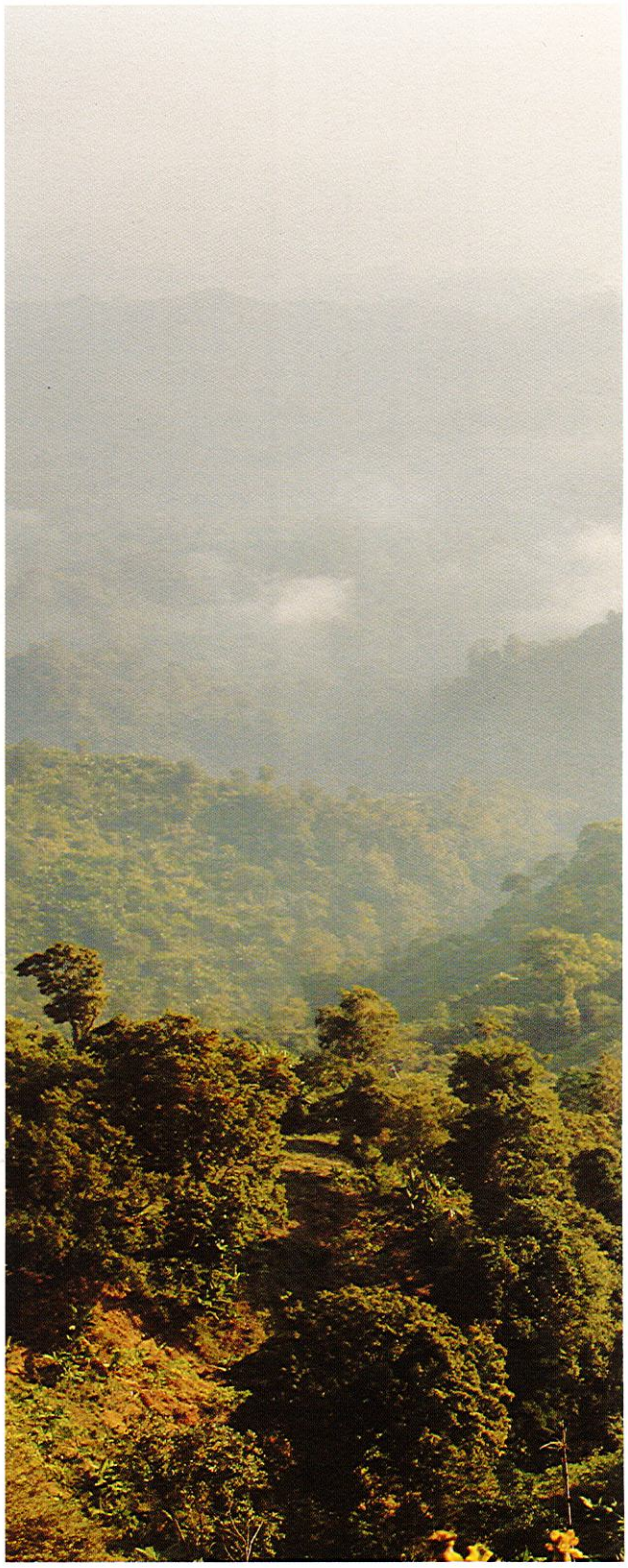
Now-a-days VCF plays an important role in conserving natural forest resources as well as

fulfilling daily needs of forest resources like bamboo, timber, medicinal plants, fuel wood and other minor forest products for domestic purposes of many indigenous communities (Chakma 2005). Moreover, the indigenous communities are economically benefited from the VCF containing rich biodiversity. Therefore, there is a vital need to protect and manage the VCF which still contains diversity of plant and animal and becomes essential for livelihood, cultural and religious needs of indigenous community and the ecosystem as a whole.

1.3 Management of VCF

Village Common Forest (VCF) is a natural forest other than the government forest around the households of the local ethnic or indigenous communities and managed to fulfill their daily demands (Baten *et al.* 2010, Roy 2000). The origin of community managed VCF in the CHT is primarily due to forest resource limitations caused by mostly deforestation, drastic loss of forest coverage leading to land degradation and the prevention of access into the newly acquired reserved forests (which were declared as 'off limits' or 'not allowed' to local people). These constraints led local communities to formulate more sustainable modes of the natural resources management. Therefore, an innovation based upon indigenous traditional resource management patterns to sustain forest cover for long-term use, gave birth to the VCF during the first quarter of the 20th century (Baten *et al.* 2010). Two types of VCF management in the CHTs are observed viz. semi-structured and unstructured methods. Under semi-structured methods, the VCF management involves the local adult people of a particular village, and in some cases, village communities form unincorporated associations with restricted membership and elect office-bearers. They even reduce their use and resource-sharing practices into formalized rules (Misbahuzzaman *et al.* 2008). On the other hand, the unstructured methods are more common, in which the *mouza* head or Headman and village head or Karbari usually plays a prominent role. In this method, VCFs are managed by the villagers living around it and the village headman is the head of the group.They form a group democratically and

after every three years the executive committee is elected by the members of those villages. They collectively set the rules of VCF management and punish the rule breaker. Even though resource extraction by the individual is restricted in VCF but with permission from the executive committee, family members may extract wood and other natural resources for their domestic uses (Baten *et al.* 2010). However, there are no written rules for VCF management and all the rules are traditionally followed. Moreover, the rules are not same in all the VCFs. They differ with different ethnic communities and with local condition. A streneaous study by Baten *et al.* (2010) revealed that the following 10 rules are strictly followed by the community members for managing VCFs: 1) any type of fire works are restricted in the VCF area, 2) without prior permission of the forest management committee (Executive committee) access to the VCF is restricted, 3) fifty taka penalty for each bamboo if any villager extract bamboo without permission, 4) every year new plantation should be done in VCF by the members along with private forest, 5) immature bamboo extraction is restricted, 6) the executive committee will approve the demand of forest resources in general meeting before starting extraction, 7) commercial selling is prohabited unless the committee decides to spend the money collected from the selling of forest products in community development (developing prayer homes, schools, roads etc), 8) committee can permit the outside villagers to collect forest resources in case of emergency, 9) harvesting of bamboo is generally done every after 2 to 3 years, 10) hunting is strictly prohibited in all the cases. Permission are given by the VCF management committee to collect firewood, culinary herbs and non-wood forest products such as bamboos, sungrass, honey. Generally forest resources are open for all the households of the community but they need permission from the community chief (Misbahuzzaman *et al.* 2008).



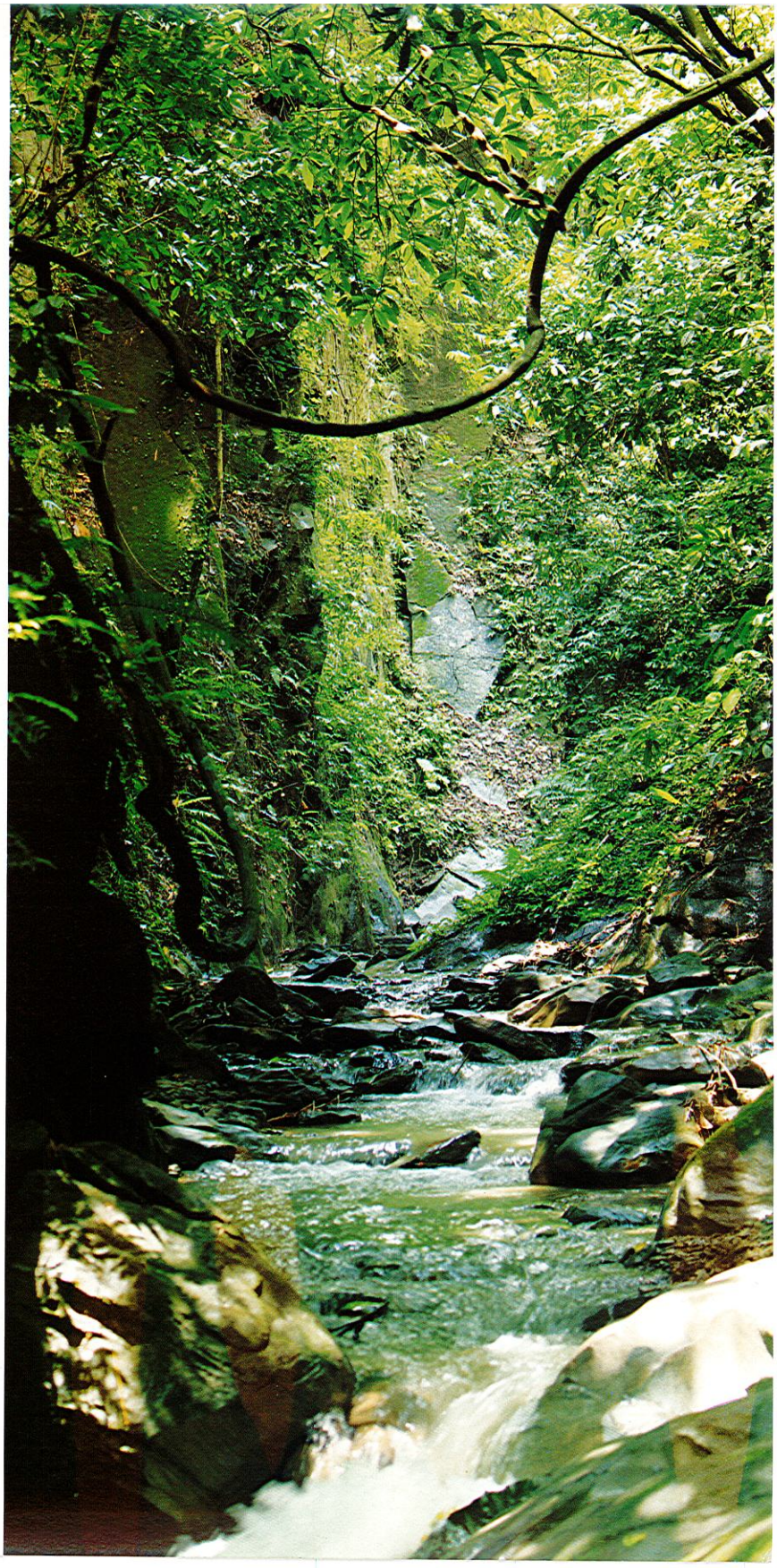
Hill forest in Bandarban district

CHAPTER 2
DOLUCHARI VCF

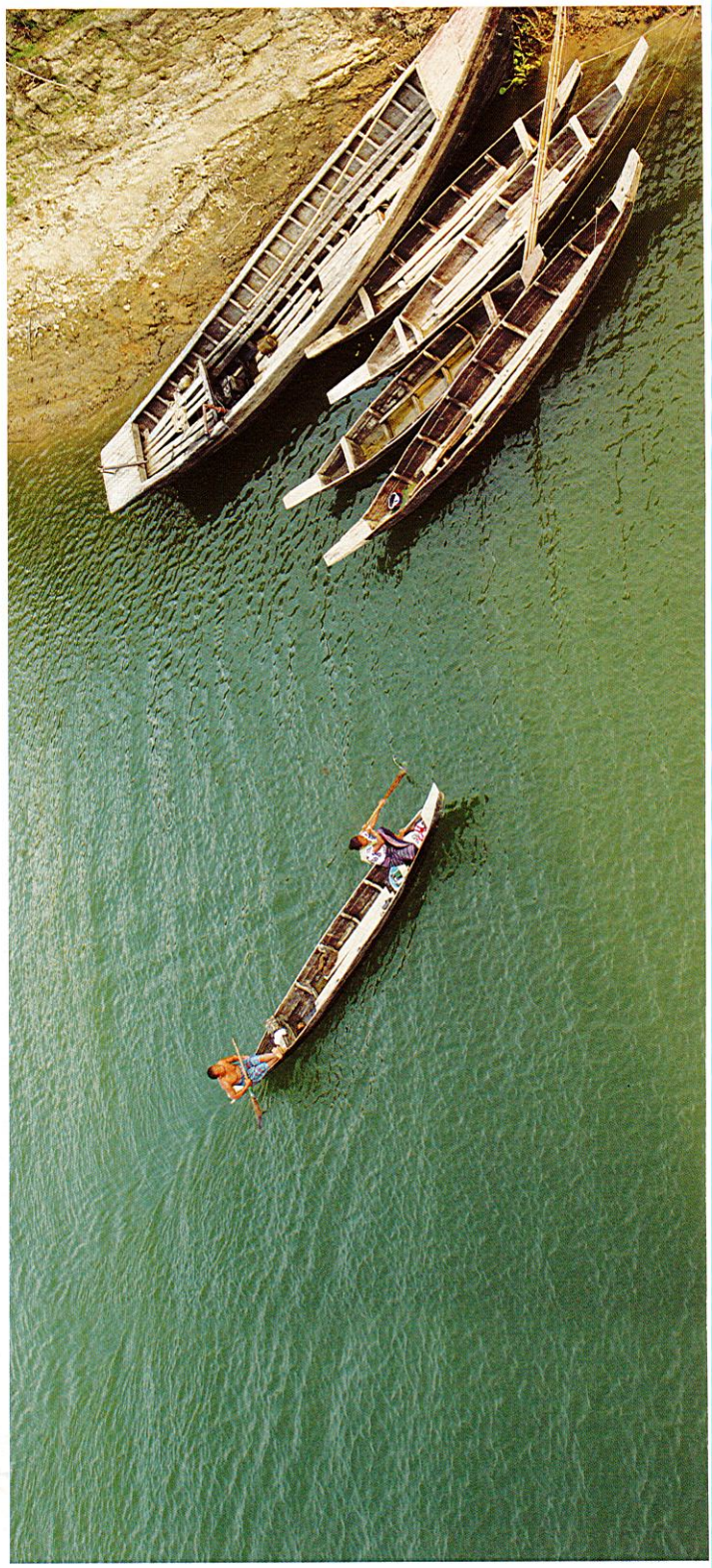
2.1 Doluchari Village Common Forest (DVCF)

Doluchari Village Common Forest (DVCF) or Doluchari Public Reserve is situated in Baradam Mouza of Mogban union of Rangamati Sadar Upazila. Doluchari VCF (22°33´859"N and 92°08´939"E) is 20 km away from Rangamati town and 5km away from the highway running from Rangamati to Kaptai. This VCF is encircled by four villages/paras *viz*. Keretkata on the south (entry point from Baradam Bazar), Doluchari-Shap Chari Moin para in the north, Kukujjyachari para in the east and Rampahar/Kholabunia Moinpara in the west.

The total area of DVCF is about 68.7ha which is basically a hilly terrain of about 50 to 150m height. The vallyes of this hill in DVCF area are situated in the north and south western corner. Two major streams running through the VCF *viz*. Kukujjyachari chara in the north eastern side and Doluchari chara in the south western side. Several other small streams, locally known as 'chara', spread over the VCF and are connected with these major streams. These streams eventually end in Kaptai lake.



Streams (chara) are the arteries of the ecosystem, maintaining energy flow and keeping environment healthy. Numerous streams inside DVCF make it an oasis of the biodiversity of this area

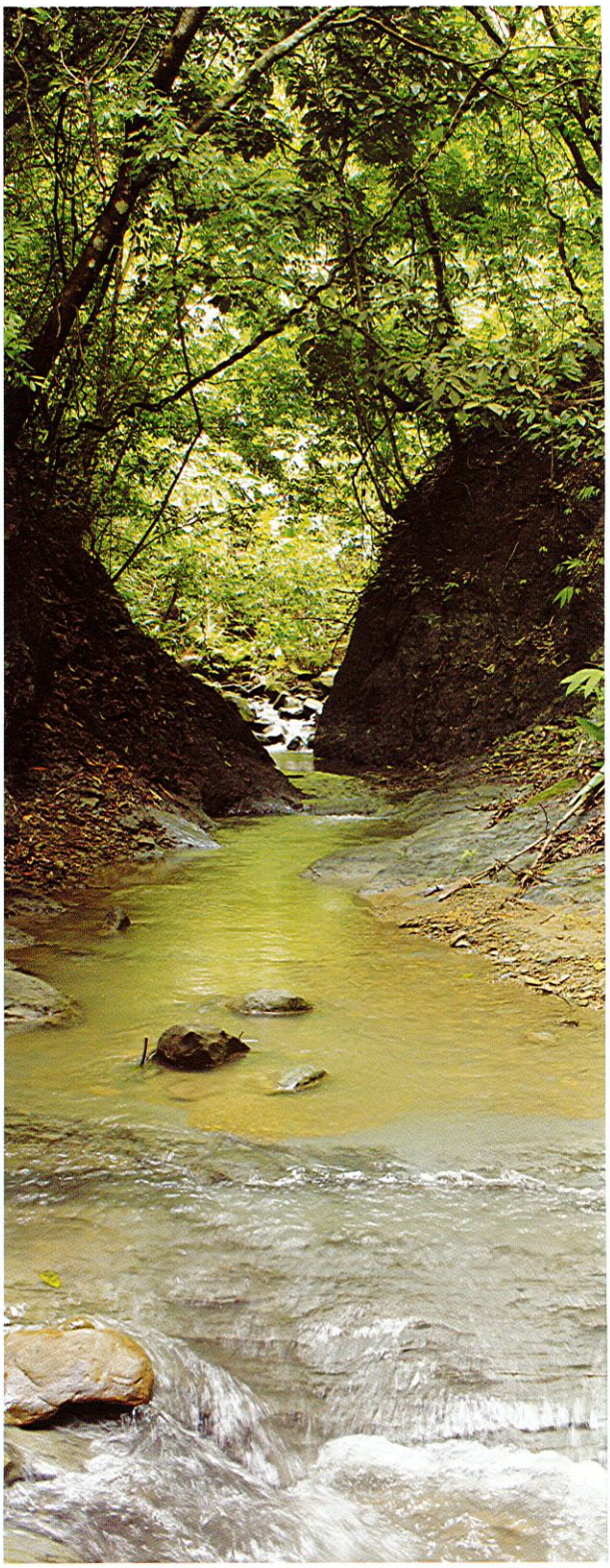


Way to Doluchari VCF: it takes an hour ride from Rangamati town to Baradam bazar by road. During winter it takes 30 minutes by boat from Baradam bazar to Keretkata and 45 minutes by walk through the valley from Keretkata to DVCF. In monsoon boat reaches DVCF directly from the Baradam Bazar.

Seasonal variation in vegetation cover of DVCF: trees shed their leaves during dry season (top). Trees full of lush green leaves during monsoon (bottom)

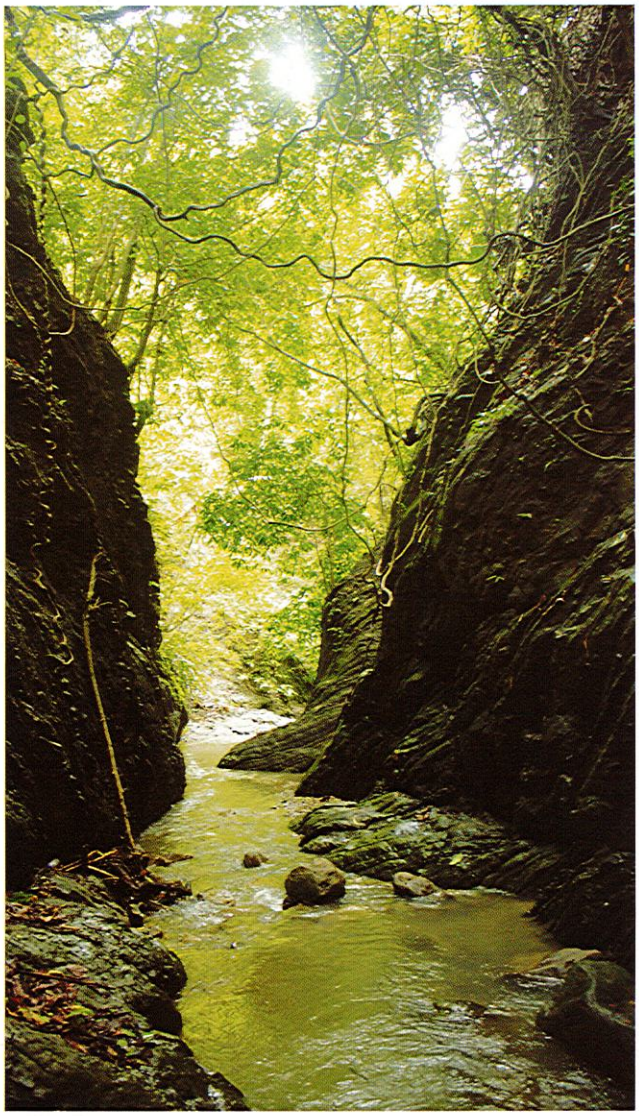
Eastern side of DVCF: the eastern side of VCF is demarcated by Kukujjyachari chara (stream) which runs in between eastern side of VCF and Kukujjyachari hills. It is the major water source for both forest dwellers and local people from nearby hills. This chara becomes dry during winter season and almost brimmed with water during rainy season, which ultimately ends in Kaptai lake. The another source of water is a water fall which is located at high of 40 feet in the far eastern side of the VCF. This side is full of natural forests and play a vital role in forest ecology. Only a few rays of sun light peeps through the intricate mesh of trees here. Five different *Ficus* spp. were found in eastern side of the VCF. Ficus trees are renowned for their enormous supports as keystone species. Many wildlife aggregate here for food and shelter. A troop of Assamese Macaque (*Macaca assamensis*) was recorded from the eastern side of the VCF. In addition to the tree species, wild banana (*Musa* sp.) is frequently found here. Besides this, bamboo, cane, climber, fern are also found there. Some of the common bamboo species are: Bariala (*Bambusa valgaris*), Basali (*Teinostavhayum griffithi*), Daloo (*Neohuzeaua dullooa*), Kali (*Oxytenanthera nigrociliata*), Kaiera (*Oxytenanthera auriculata*), Mitenga (*Bambusa tulda*) and Muli (*Melocana baccifera*).

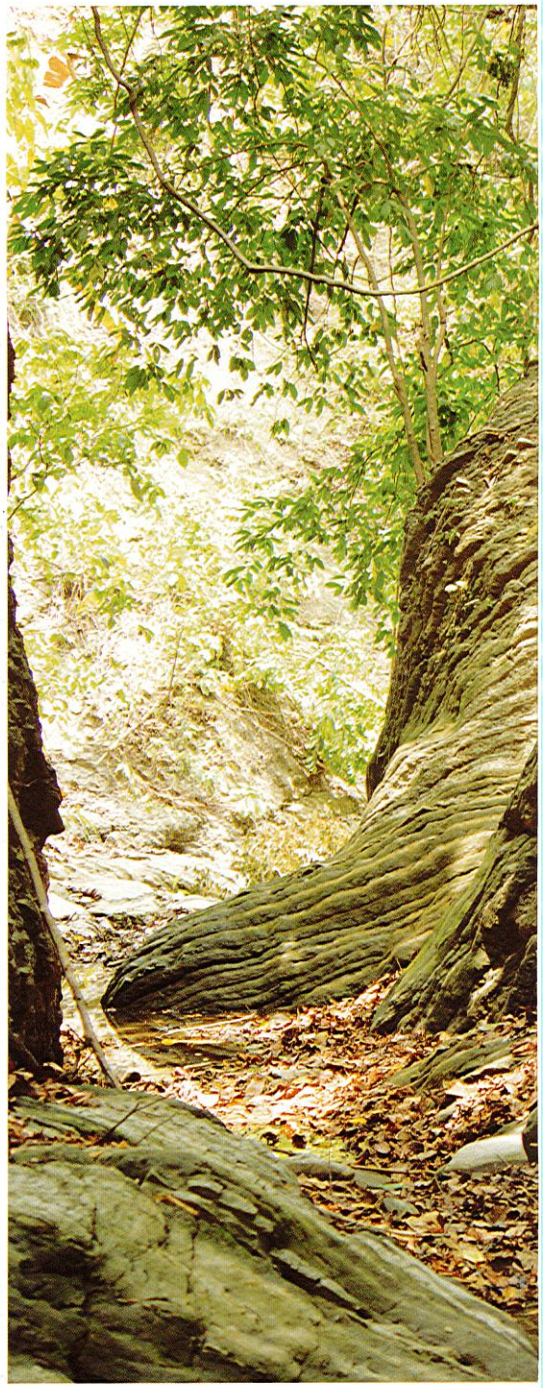
On the other hand the scenario is completely different for Kukujjyachari hill which is outside the VCF just adjacent to the eastern boundary. Kukujjyachari hill is almost clear and degraded due to high anthropogenic pressure. People from nearby villages practice extensive Jhum cultivation in the slopes of this hills. Major crops are Turmeric (*Curcuma longa*), Banana (*Musa* sp.), Rice (*Oryza sativa*), Brinjal (*Solanum melongena*), Lemon (*Citrus* sp.) and other vegetables. No major naturally grown trees are present in this hills except some wild banana variety and bushy vegetations.

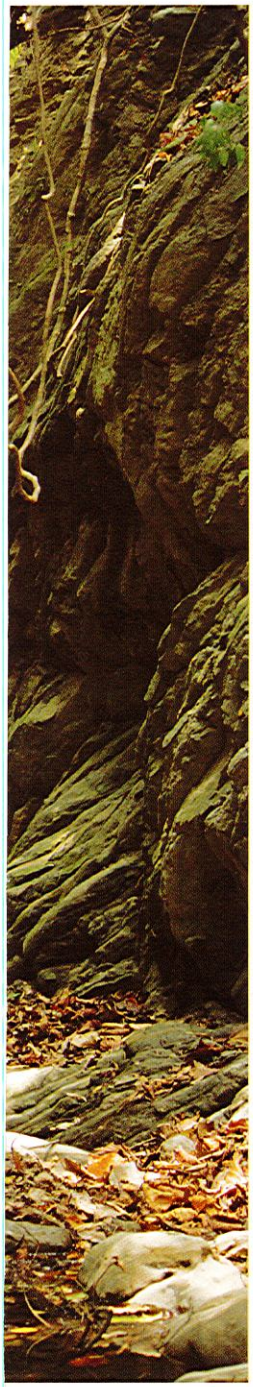


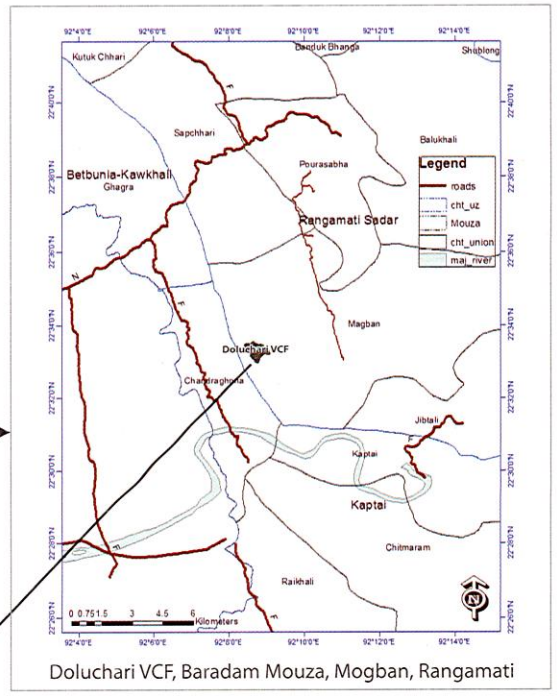
Kukujjyachari chara

Kukujjyachari chara provides major water during monsoon while dries up during winter with some water puddles those are the permanent water source for wildlife in winter

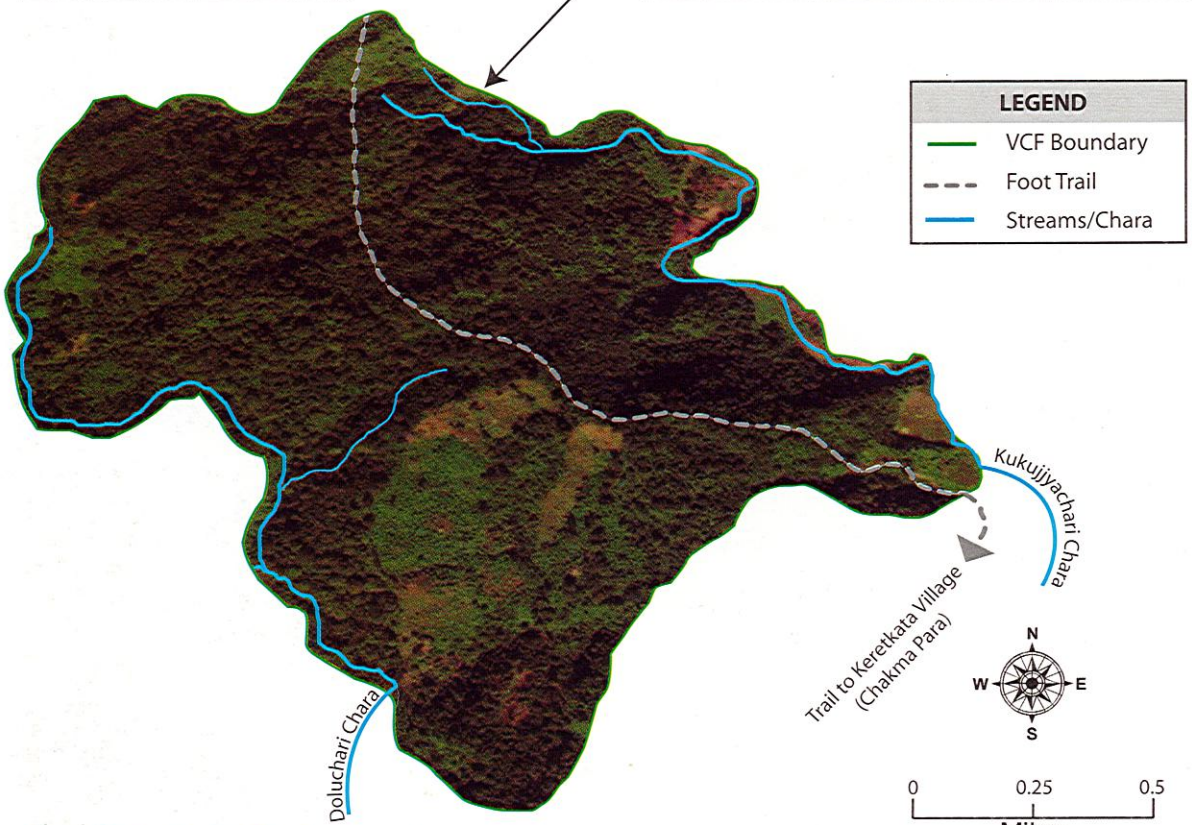




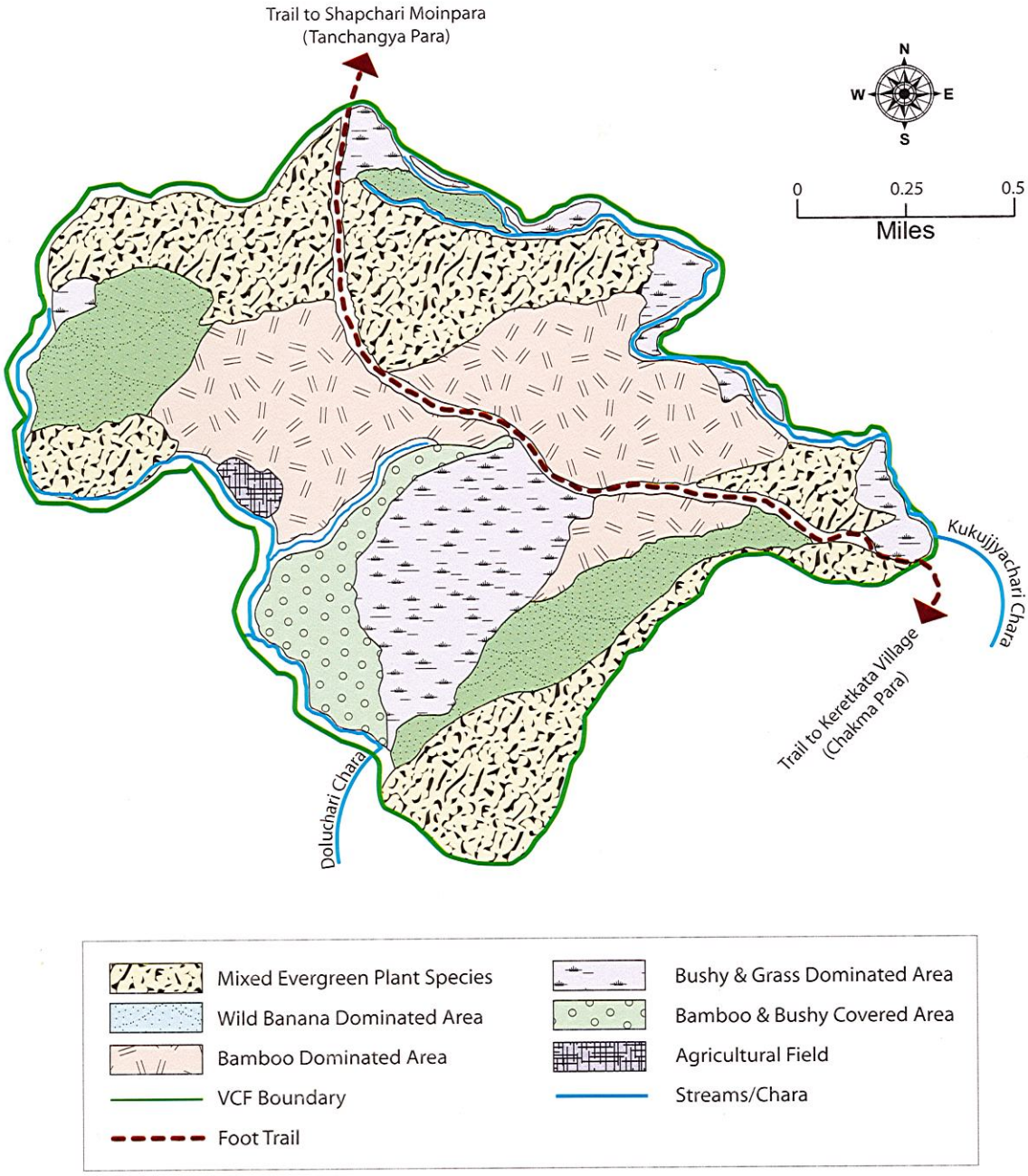




Doluchari VCF, Baradam Mouza, Mogban, Rangamati



Map of Doluchari VCF in Rangamati

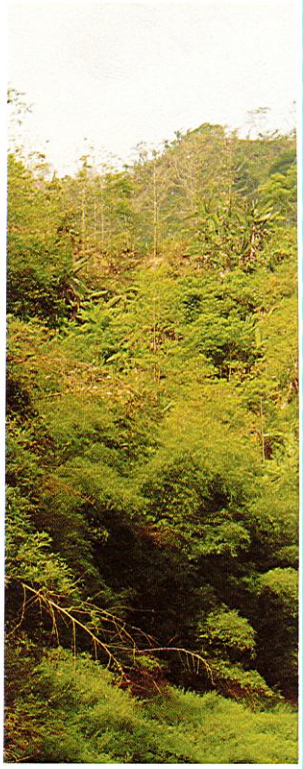


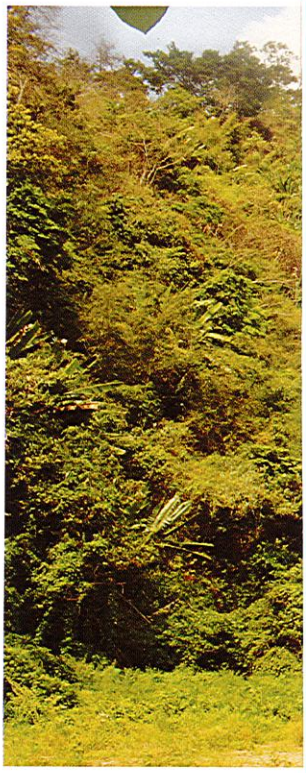
Map of Doluchari VCF Showing different habitat type

South-Western side of DVCF: the south-western boundary of Doluchari VCF is delineated by both Doluchari hills and Debtachari hills. These hills are the extension of Rampahar hill series. Plantation of Teak (*Tectona grandis*) is very common in these hills. A big ficus tree is present at the entrance of the south-western side which provides food to wild animals almost year round. Doluchari chara runs alongside the VCF and Doluchari-Debtachari hills. Anybody can injoy the chirping of a forest bird, Black-backed Forktail (*Enicurus immaculatus*) through the entire chara if he/she walks silently along the south-western portion of DVCF boundary. During dry season the chara contains relatively few water in the form of small to medium sized pits or ditches. These small reservoirs then support many herpetofauna species and large insect population. Slowly running water along rocky stream acts as breeding ground for many dragonflies and damselflies. But during wet season (June-July) the chara swells up and runs with its full pace, washout all egg/larvae of the insect in the ditches. The slanting and moist hilly wall of south-western DVCF is the home for spiders, beetles, Marbled Cascade Frog and many lizards. South-western side of the DVCF is characterized by mixed evergreen tree species where *Ficus* spp. wild banana and Bamboos are most dominant species.

Northen side of DVCF: Doluchari-Shap Chari Moinpara is solely belongs to Tanchangya community which delimits the northern boundary of DVCF. This portion has relatively less tree covered area in relation to other sides of DVCF. The opposite of the northern side of the DVCF is completely degraded due to unsustainable and uncontrolled shifting cultivation. People of Tanchangya communities as well as Chakma communities cultivate Coriander (*Coriandrum sativum*), Turmeric (*Curcuma longa*), Banana (*Musa*sp.), Rice (*Oryza sativa*), Brinjal (*Solanum melongena*) etc. just beside the DVCF and gradually encroaches inside the DVCF.

Central part of DVCF: central part of the DVCF is the most diverse in relation to natural vegetation. A very old Bohera (*Terminalia bellirica*)





Plantation of Teak (*Tectona grandis*) is very common in south-western side (top) while mixed evergreen forest patches are found in northern side of DVCF (bottom)

tree is located in the central part of this VCF which acts as an umbrella for the VCF. In addition Chapalish *(Artocarpus chaplasha),* Civit (*Swintonia floribunda*), Garjan *(Dipterocarpus* spp.*)*, Telsur (*Hopea odorata*), Dhakijam *(Syzygium grande)* Bandarhola *(Duabanga grandiflora)*, Jarul *(Lagerstroemia speciosa)*, Kadam *(Anthocephalus chinensis)*, Pitali *(Trewia nudiflora)*, Shimul *(Bombax ceiba)*, Barodumur (*Ficus auriculata*) are abundant here. Numerous shrubs, herbs, climbers and other epiphytes are also found in this central part.

Bhant (*Clerodendrum viscosum*), Bonboroi (*Ziziphus oenoplia*), Daloo (*Neohuzeaua dullooa*), Mitenga (*Bambusa tulda*), Lantana (*Lantana camara*), Ashok (*Saraca thaipingensis*), etc are the major shrubs which are characterized by woody vegetation and grow relatively close to the ground. Among herbs, Jharful (*Thysanolaena maxima*), Bonroi (*Costus speciosus*), Kash (*Saccharum spontaneum*), Mutha (*Cyperus rotundus*), Banokra (*Urena lobata*) are most commonly seen. Climbers play an important role in forest ecosystem. Doluchari VCF supports numerous climber species like natural evergreen forests. Such as Guicha lata (*Calycopteris floribunda*), Gila (*Entada scandens*), Pakur (*Ficus scandens*), Kumarilata (*Smilax laurifolia*), Pahari Dhundul (*Luffa graveolens*), Ulatchandal (*Gloriosa superba*) etc.

Inside DVCF

Rich natural vegetations are found inside the south eastern boundary of DVCF while cultivated crops are found just outside the boundary because of jhum cultivation

Outside DVCF

2.2 Importance of Doluchari VCF

Doluchari VCF is a stable, sustained and complete evergreen forest ecosystem. All the climaxes of the ecosystem are observed in this small area. Subtropical humid climate with the mixture of evergreen and deciduous floral composition and other faunal communities make it a very diverse ecosystem in this region. Few large creeks (chara) contain water throughout the year in this VCF while numerous small creek (chara) dried up in winter and flooded with the flash flood during rainy season from the hills and maintain the dynamics of this ecosystem. Interaction between the abiotic and biotic component in the village common forest is vivid. Thick bio-decompose on the forest floor with thick undergrowth make this VCF a heaven for the invertebrate communities which eventually support huge insectivorous birds and few mammals on the top of the food pyramid. Food chain, which is one of the main features of energy flow, from one trophic level to the other in the ecosystem, has also been observed in this VCF. Predation is observed among invertebrates as well as in vertebrates. Several species of spiders were recorded to prey upon beetle and other insects while birds were observed to eat spiders.

Different types of trees like Figs and Bohera act as keystone species because they provide food and shelter to various wildlife *viz.* White-rumped Shama, Yellow-footed Green Pigeon, Barbets, Drongos, Golden Fronted Leaf bird, Black Crested Bulbul, Lizards, Rhesus Macaque, Hoary-bellied Squirrel and insects. Figs (*Ficus* spp.) are aseasonal flowering trees and provide food throughout the year both to frugivorous birds and mammals as well as for terrestrial herbivores. The bushy area of VCF also represents great diversity of butterflies, insects and small birds like prinia, monarch, flowerpeckers. Large number of trees contribute to their environment by providing oxygen, improving air quality, conserving water in chara through rocky upper layer and preserving soil. Trees also preserve warmth by providing a screen from harsh environment. Moreover, trees absorb and store rainwater which reduce runoff and supply water into two major charas in VCF. This is the main source of drinking water for the villagers as well as the water for irrigation. Many animals including monkeys, Barking Deer, Pallas's Squirrel feed on leaves while sunbirds, bats and many insects depend on flowers and nectar. Deep vegetation cover and bushes protect many wild animals including squirrels and birds from predators. DCVF is the home of many indicator species those indicate the health of the ecosystem. Crown Frog, Asian Painted Frog, Cope's Assam Forg, Green Fan-throated Lizard are forest dwelling species and are only found in good quality forests. Although these species are rare in many forests in Chittagong Hill Tracts, but common in this VCF. Greater Racket-tailed Drongo is a habitat specialist bird and only found in the forest habitat rich with insect population. Greater Racket-tailed Drongo is fairly common in DVCF.

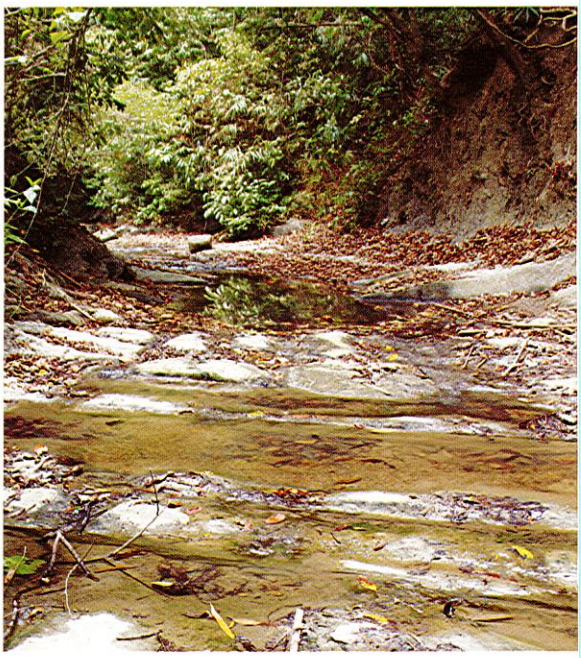
Amphibian breeding pool in stagnant water

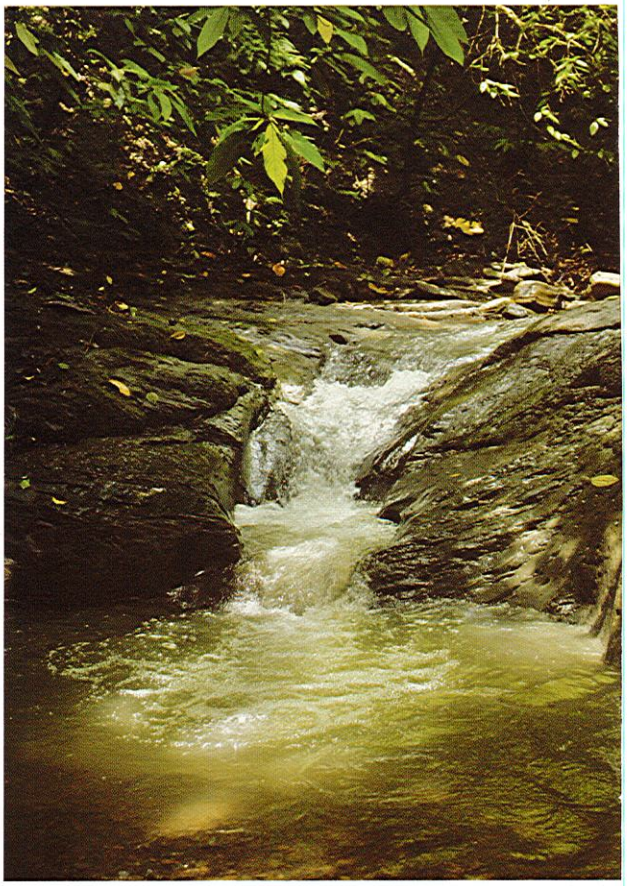
2.3 Watershed

Two perennial streams namely Doluchari chara and Kukujjyachari chara run through the south-western and north-eastern side of VCF which hold water year round. These two streams supply pure drinking water for many indigenous

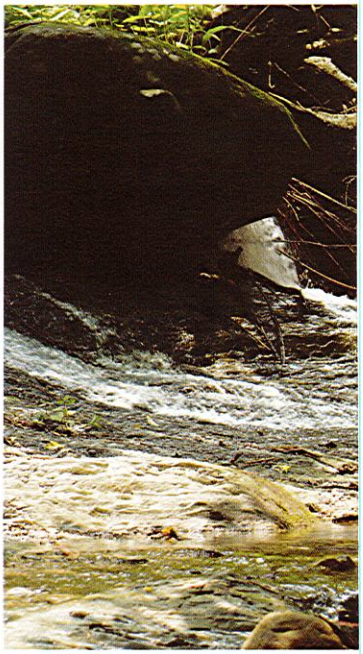
Waterfall in north-eastern side of Doluchari VCF

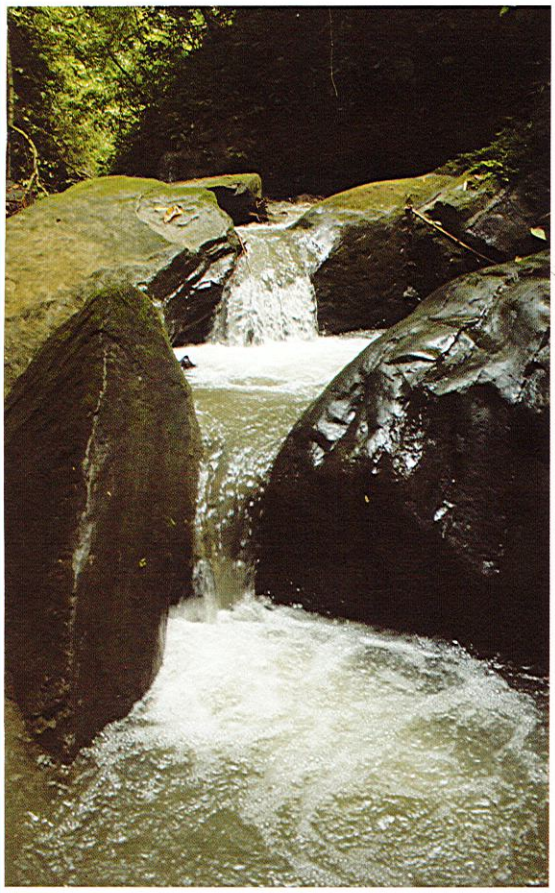
Many ditches through the major water streams hold water during dry season and act as vital drinking water sources for wild animals as well as provide shelter for crustaceans, fishes, frogs and turtles. Moreover, these stagnant water bodies serve as breeding pools for many amphibians. Many of those ditches are found full of tadpoles during late winter months.

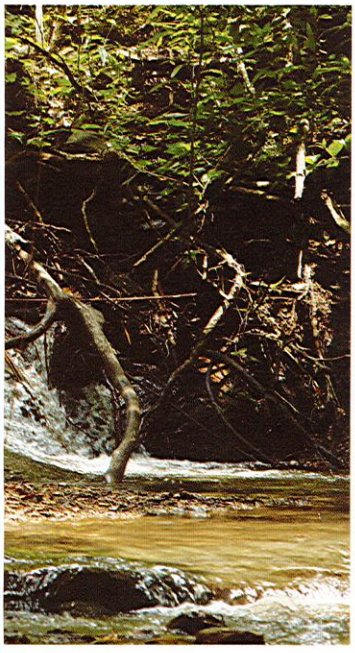




Flash flood during monsoon rejuvenates water streams by washing out debris and obstacles. Flash flood re-excavates water streams and also helps to drain out excessive water from the hills to the Kaptai lake







communities as well as water for forest flora and fauna. In addition some seasonal streams run through this VCF completely dried up during dry season. A natural waterfall of about 40 feet high is situated in the far eastern side of the VCF in Kukujjyachari hill. The waterfall remains active for whole wet season and becomes dry up during winter.

2.4 Habitat diversification

Doluchari VCF is an oasis for wildlife of this region because of its diverse habitat types. Within its small area, all major wildlife habitats are found *viz*. evergreen forest patches, bushy areas, plantation, crop land and steam.

This VCF is mixed evergreen in nature as in other forested areas of Chittagong Hill Tracts. This forest patch is dominated by evergreen trees, but also has some deciduous tree species. The major tree species include Chapalish (*Artocarpus chaplasha*), Garzan (*Dipterocarpus* spp.), Jam (*Syzygium* spp.), Bot (*Ficus* spp.), Shimul *(Bombax ceiba)*, Barodumur (*Ficus auriculata*). Other plant species of this VCF include different species of Bamboos (*Bambusa* spp.), epiphytes, climbers and ferns.

In the vicinity as well as inside the VCF there are some areas which are covered by dwarf vegetation occupied by bushes and grasses. Common bushy plants are Lantana (*Lantana camara*), *Eupatorium* spp., *Clerodendrum* spp., Kash (*Saccharum spontaneum*), Mutha (*Cyperus rotundus*) and others. Such bushy area provides shelter for elusive wildlife fauna. Various species of butterflies, moths, dragonflies and damselflies, grasshoppers, spiders, beetles use these bushes for food and shelter.

Any kind of cultivation or agricultural practice is strictly prohibited inside VCF, few scattered small scale Coriander (*Coriandrum sativum*) and Banana (*Musa* sp.) cultivation are observed in western and northern boundary. Outside this VCF area, the whole surrounding is being extensively exploited as agricultural fields via jhum cultivation. Large scale paddy cultivation is practiced by Keretkata village communities (Chakma) near southern most valley of the VCF.

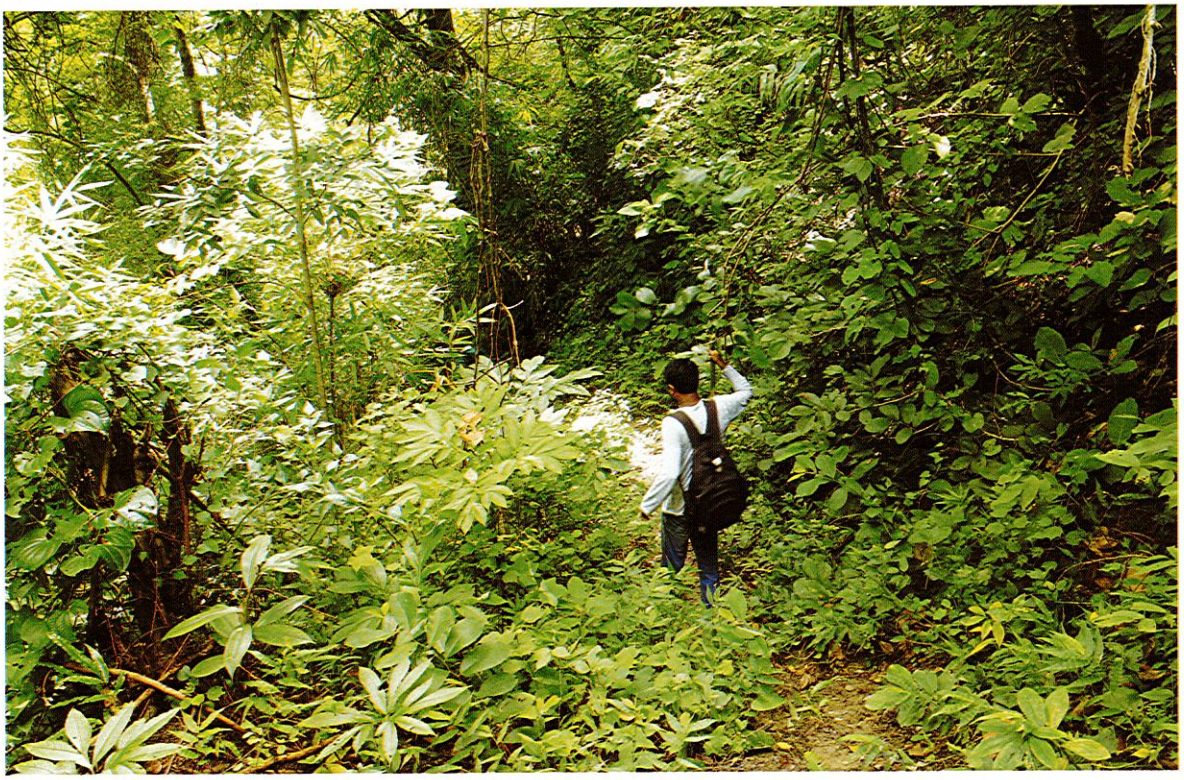
The dense vegetation cover of Doluchari VCF provides food and shelter to many wild animals; especially for secretive mammals and herpetofauna. Local community also collect medicinal plants from this area

Though these crop fields are disturbed by human activities throughout the year, still support many small mammals (rodents, mongoose) and herpetofauna.

All the hills encompasses VCF is widely being used as plantation site for Teak (*Tectona grandis*), Gamar *(Gmelina arborea)*, Mehogony *(Swietenia* spp.*)*, Chapalish *(Artocarpus chaplasha)* and Acacia (*Acaia* spp.). Plantation is also allowed and practiced in VCF with the permission of village headman or Karbari from time to time. Such plantation play significant role in supplying timber for village people.

Patches of bamboo thickets are seen in Doluchari VCF. Bamboo shoots are lucrative food to some wild mammals like Wild Boar, bamboo rats and the tribal community. Bamboo thickets also serve as favourite habitat for rodents, snakes, skinks and other herpetofauna

Thick under growth (top photo) and wild banana dominated patches (bottom photo) provide food and shelter to the small mammals of DVCF

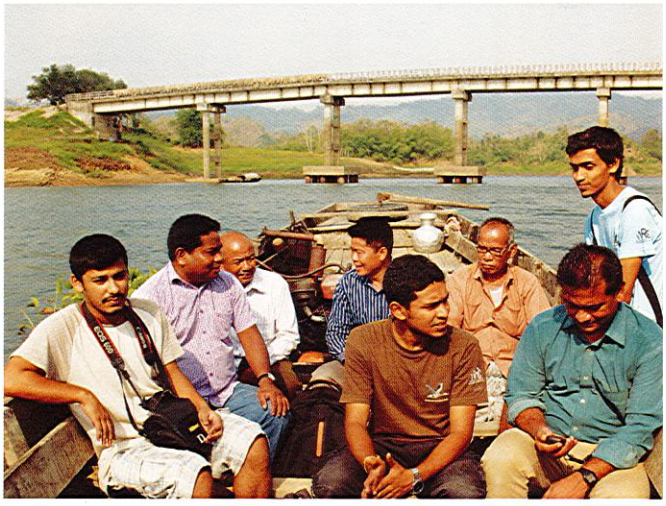


CHAPTER 3
BIODIVERSITY MONITORING IN DOLUCHARI VCF

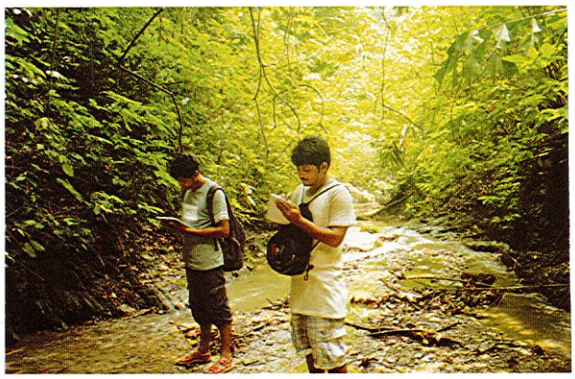
Before starting wildlife census in a given area, one should determine what kind of information he wants to gather. Since the methodology for systematic census of different wild species varied considerably, a successful census requires careful systematic planning. Technique should be readily standardized, facilitate repeatability, can be applied in most of the habitat conditions and hence, can be compared with one another. Thus results are within a known level of accuracy and precision and margins of error that can be quantified. The biodiversity monitoring and survey techniques followed for this study to evaluate present status of biodiversity in Doluchari VCF have already been used by the researchers of this team in different protected areas of the country (Feeroz 1991, 1999, 2001, 2003, 2011, 2013, 2014, 2016; Feeroz *et al.* 1995, 2011, 2012; Reza *et al.* 2000, 2003; Hasan *et al.* 2007, Feeroz and Uddin 2015, Khan 2005-2008), usefulness and acceptance of these methods has already been proven.

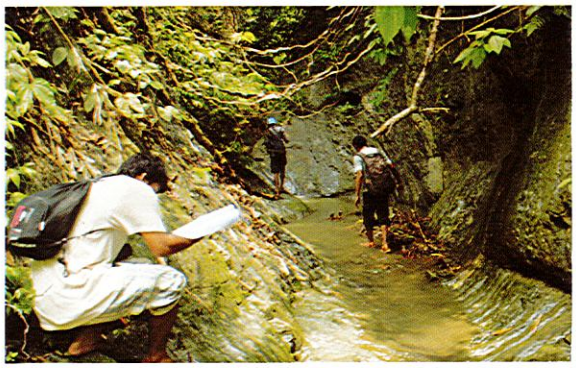
In 2016, four field works have been conducted in Doluchari VCF covering all seasons for this study. Data collection in each field work was implemented by a team of senior (two Professors and one Associate Professor) and junior (four research students of PhD or MSc) researchers of the Wildlife Research Group (WRG), Department of Zoology, Jahangirnagar University with the help of two representative from the local communities as local guide.

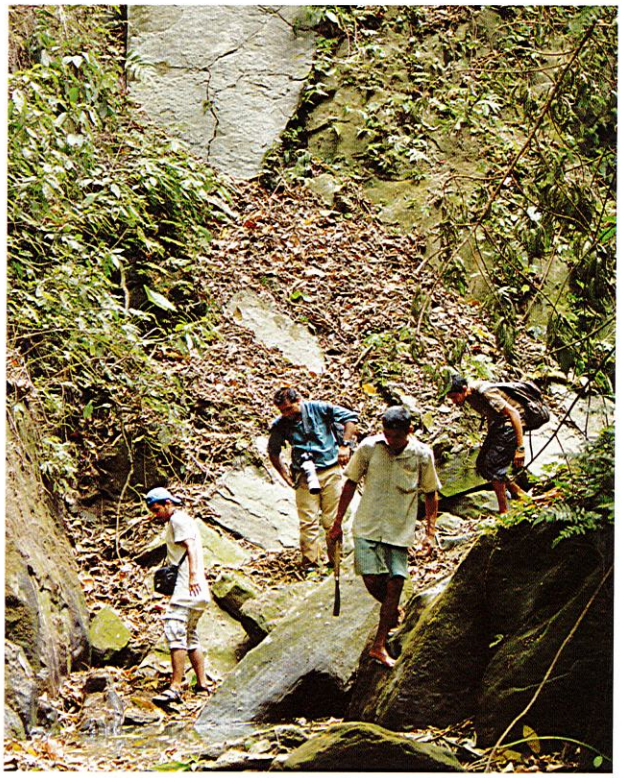
Eight days were spent in each field trip by this team. Wide range of methods were followed so that all types of wildlife, large and small, diurnal and nocturnal, was covered. The methods that were used for monitoring and inventory of flora and fauna in the field are strip-transect sampling (for birds and mammals), camera-trap survey (for nocturnal and elusive animals), box-trap survey (for small rodents), pitfall survey (for amphibians and reptiles), mist netting (for small birds and Bats) and night survey (for amphibians and reptiles). Systematic interview survey was conducted among the local people living around the VCF with pre-designed questionnaire to evaluate perception of biodiversity conservation and dependency on VCF. All data were recorded on pre-designed data sheet which were eventually processed and uploaded in the online database (Bio-Track) as used for monitoring other protected areas. A total of 10 camera traps were setup in different locations of the VCF. These camera traps were active around the clock throughout each field visit. The team members in the field identified all known plant species, however, unknown plants were photographed, tagged with local name and verified by a renowned plant taxonomist of Institute of Forestry and Environmental Sciences, Chittagong University.



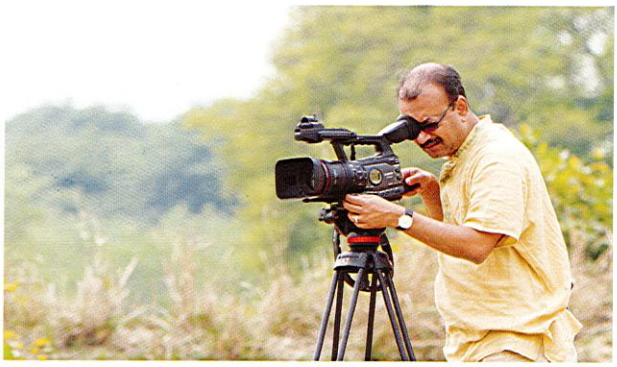
Different activities of the WRG research team for monitoring biodiversity in DVCF

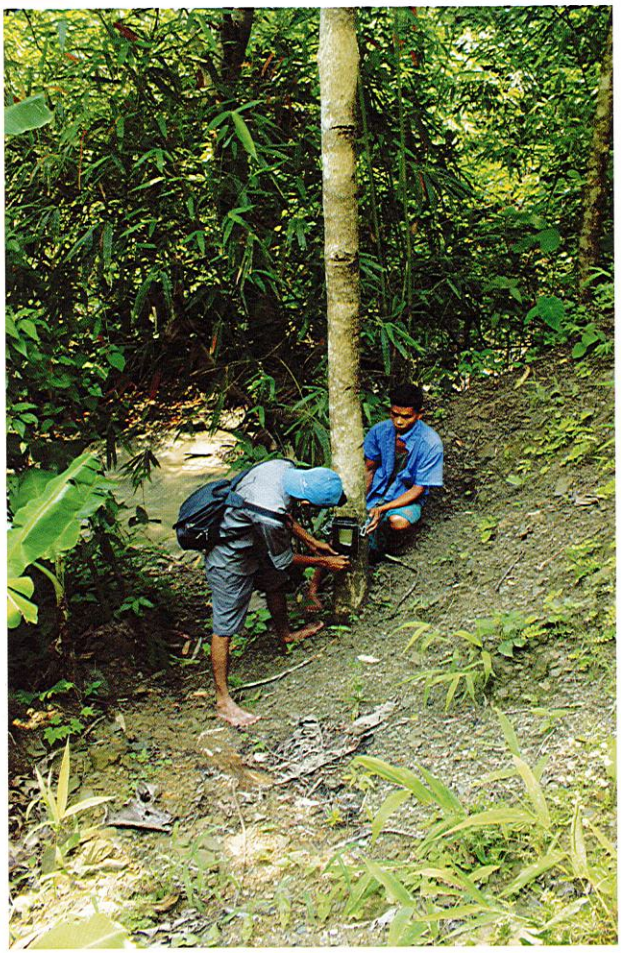






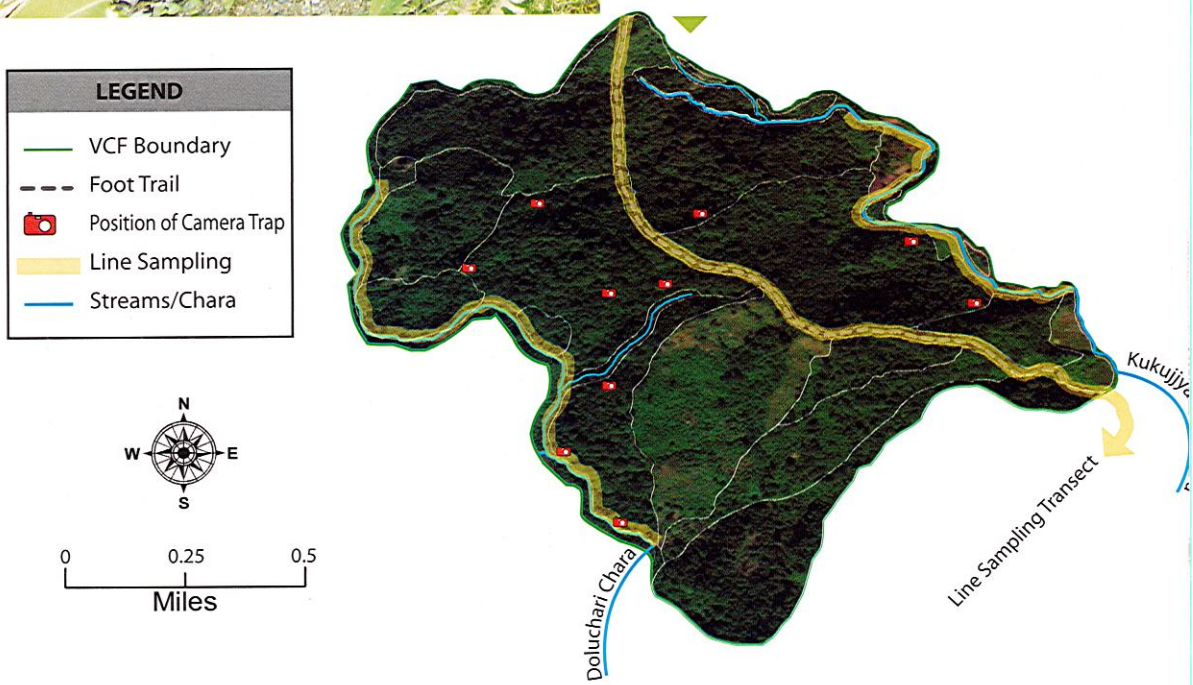
Different activities of the WRG research team for monitoring biodiversity in DVCF





Systematic camera trapping for monitoring nocturnal animals in DVCF

Map showing positon of camera traps and foot trails used as line transects for wildlife survey in DVCF



Studying elusive animals in DVCF

CHAPTER 4
BIODIVERSITY OF DOLUCHARI VCF

4.1 Species diversity

Doluchari VCF is very rich in biodiversity. A total of 33 amphibians, 61 species of reptiles, 187 species of birds and 38 species of mammals were recorded from Doluchari VCF. A total of 113 species of plants were recorded from this VCF of which 39 species are tree, 19 species of shrubs, 25 species of herbs, 16 species of climbers and 4 species of parasitic plants.

4.2 Mammals

A total of 120 species of mammals are found in Bangladesh of which 87 species are found in Chittagong Hill Tracts. So it is evident that the hill forests are still much healthy and livable for the wildlife specially for mammals. It is astounding, a total of 38 species of mammals have been recorded from Doluchari VCF which is 31.67% of the total mammalian species found in Bangladesh and 42.5% of mammalian species found in the Chittagong Hill Tract. Among these mammals, 7 species of bats, 7 species of rats, 3 species of primates and small cats each are

notable. Javan Pipistrelle (*Pipistrellus javanicus*), one of the pipistrelle bats has been recorded for the first time in Bangladesh from this VCF. Asiatic Black Bear regularly visits Doluchari VCF from adjacent Rampahar hill as well as Binturong, Chinese Pangolin, Indian Crested Porcupine also visit this VCF occationally. The majority of species recorded is widespread and ecologically tolerant, and found in a range of habitats including forest, forest edge, plantations or open cultivated land throughout Doluchari VCF.

According to local indigenous people Barking Deer (*Muntiacus muntjak*) is very common in Doluchari VCF area. During the field survey this species was encountered directly as well as by remote camera trap. The reason for their frequent occurrence is due to presence of enough bushes and grassy vegetation in VCF area and subsequent prohibition on hunting by mouza headman or karbari. This is an Endangered (EN) species according to Red List of Bangladesh 2015 and found almost all protected forest areas in northeast and southeast.

Asiatic Black Bear (*Ursus thibetanus*) is a vagrant species in Doluchari VCF and Jhum cultivators from nearby hills reported its occurrence strongly. Presumably this species visits here from nearby Kaptai National park. This species is a Critically Endangered (CR) animal in Bangladesh (IUCN Bangladesh 2015).

On 8th August 2016, photo of a Asiatic Brush-tailed Porcupine (*Atherurus macrourus*) was captured by a camera trap near bamboo thickets of the south western part of Doluchari VCF.

Camera Trap photo of Barking Deer (top) and Asiatic Brush-tailed Porcupine (bottom) recorded in DVCF

Mammals in Doluchari VCF

Status Code: V- Very Common, C- Common, U- Uncommon, and R- Rare

English Name	Scientific Name	Status
Order: Primates		
Family: Cercopithecida		
Rhesus Macaque	*Macaca mulatta*	V
Assamese Macaque	*Macaca assamensis*	R
Pig-tailed Macaque	*Macaca leonina*	U
Order: Rodentia		
Family: Hystricidae		
Indian Crested Porcupine	*Hystrix indica*	R
Asiatic Brush-tailed Porcupine	*Atherurus macrourus*	R
Family: Muridae		
Common House Rat	*Rattus rattus*	R
Lesser Bandicoot Rat	*Bandicota bengalensis*	C
Large Bandicoot Rat	*Bandicota indica*	C
House Mouse	*Mus musculus*	R
Little Indian Field Mouse	*Mus booduga*	R
Asiatic Long-tailed Climbing Mouse	*Vandeleuria oleracea*	C
Family: Spalacidae		
Lesser Bamboo Rat	*Cannomys badius*	C
Family: Sciuridae		
Pallas's Squirrel	*Callosciurus erythraeus*	C
Hoary-bellied Squirrel	*Callosciurus pygerythrus*	V
Order: Eulipotyphla		
Family: Soricidae		
Asian House Shrew	*Suncus murinus*	V
Family: Tupaiidae		
Common Tree Shrew	*Tupaia glis*	R
Order: Chiroptera		
Family: Megadermatidae		
Greater False Vampire	*Megaderma lyra*	R
Family: Pteropodidae		
Indian Flying Fox	*Pteropus giganteus*	C
Short-nosed Fruit Bat	*Cynopterus sphinx*	C
Family: Vespertilionidae		
Indian Pipistrelle	*Pipistrellus coromandra*	C
Javan Pipistrelle	*Pipistrellus javanicus*	R
Greater Asiatic Yellow House Bat	*Scotophilus heathi*	R
Lesser Asiatic Yellow House Bat	*Scotophilus kuhlii*	R

Rhesus Macaque

Mammals in Doluchari VCF (continued)

English Name	Scientific Name	Status
Order: Pholidota		
Chinese Pangolin	*Manis pentadactyla*	R
Order: Carnivora		
Family: Canidae		
Golden Jackal	*Canis aureus*	C
Family: Felidae		
Jungle Cat	*Felis chaus*	R
Leopard Cat	*Felis bengalensis*	R
Fishing Cat	*Felis viverrina*	R
Family: Herpestidae		
Crab-eating Mongoose	*Herpestes urva*	C
Small Indian Mongoose	*Herpestes auropunctatus*	C
Family: Mustelidae		
Hog Badger	*Arctonyx collaris*	R
Family: Ursidae		
Asiatic Black Bear	*Ursus thibetanus*	R
Family: Viverridae		
Common Palm Civet	*Paradoxurus hermaphroditus*	R
Large Indian Civet	*Viverra zibetha*	C
Small Indian Civet	*Viverricula indica*	R
Binturong	*Arctictis binturong*	R
Order: Cetartiodactyla		
Family: Cervidae		
Barking Deer	*Muntiacus muntjak*	C
Family: Suidae		
Wild Boar	*Sus scrofa*	R

Camera Trap photo of Wild Boar (top) and Large Indian Civet (bottom) recorded in DVCF

a

b

a) Hoary-bellied Himalayan Squirrel

b) Pallas's Squirrel

c) Small Indian Mongoose

d) Indian Crested Porcupine

c

d

Asiatic Brush-tailed Porcupine is a nocturnal and fossorial species found on the forest floor, often in areas with profuse undergrowth interspersed with cane and bamboo brakes and palms (Molur *et al.* 2005). In Bangladesh there is only a single record of occurrence of this species from Sangu Wildlife Sanctuary hence considered as Data Deficient (DD) according to updating species Red List of Bangladesh 2015. Asiatic Brush-tailed is distributed in northeastern South Asia, through much of central and southern China and mainland Southeast Asia. This elusive species is threatened by habitat loss due to unsustainable jhum (shifting) cultivation practice and forest fire, overharvesting of bamboo and subsistence harvesting for food. In Doluchari VCF Pallas's Squirrel (*Callosciurus erythraeus*) was recorded fairly common hence indicate the undisturbed habitat quality. This species can be easily recognized by its reddish belly, olive-brown upperparts and bushy tail which is longer than the head-body. Under part of the tail is reddish-brown as the belly color. The occurrence of this species was doubtful without any specific locality information until 2011. In 2011, Hasan *et al.* confirmed its locality from Dudhpukuria-Dhopachari Wildlife Sanctuary of Chittagong Hill Tracts. This species is a Least Concern (LC) species in Bangladesh (IUCN Bangladesh 2015).

Mammalian fauna reside safely in this VCF mainly because of undisturbed habitats maintained by rules and regulations adopted by VCF management committee. No animals living inside VCF can be hunted or shoot and it is strictly followed by the local indigenous community living in and around VCF. Asian Elephant (*Elephas maximus*) was once very common in this area; however, in past decade it has been extirpated from this VCF and adjacent areas.

Asiatic Long-tailed Climbing Mouse (top)

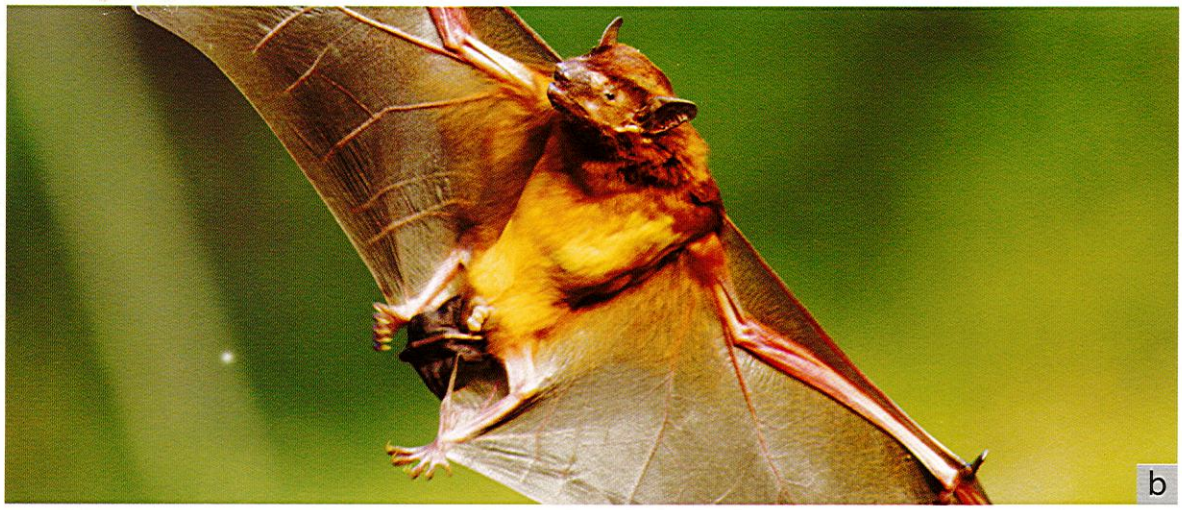
Lesser Bamboo Rat (bottom)

As an ecological indicator, bats indicate the pristine environment in a forest and perform the vital roles in the ecosystem. The fruit bats forage over different fruiting trees, spread seeds throughout the forest and hence play a major role in both pollination and seed dispersal. Insectivorous bats mainly feed on different species of insects arising at dusk as well as from the jhuming area and play a significant role as pest controller. The insectivorous bats also control mosquito population by preying on them.

Seven species of bats are recorded in this VCF. Among these, Indian flying Fox (*Pteropus gigantius*) and Greater Short nosed Fruit Bat (*Cynopterus sphinx*) are frugivorous while four species are insectivorous *viz*. Javan Pipistrelle (*Pipistrellus javanicus*); Coromandel Pipistrelle (*Pipistrellus coromandra*); Greater Asiatic Yellow House Bat (*Scotophilus heathii*); Lesser Asiatic Yellow House Bat (*Scotophilus kuhlii*).

Insectivorous bats are more common in this VCF than the fruit bats. This is mostly because of the insect abundance. On the other hand, good bamboo habitat and some old woody plants covered with climbers and epiphytes provide shelter for these bats. The insectivorous bats roost over the fork of woody plants or hole of the bamboo poles. A colony containing 12 individuals of Javan Pipistrelle (*Pipistrellus javanicus*) was located in a Teak tree (*Tectona grandis*). Coromandel Pipistrelle (*Pipistrellus coromandra*) is regularly seen to emerge out at dusk from the forest. Along with some other seasonal fruit yeilding trees, five species of *Ficus* are found scattered throughout the VCF and provide food to the fruit bats throughout the year. Greater Short nosed Fruit Bat (*Cynopterus sphinx*) was recorded to roost in this VCF. No roost of Indian Flying Fox (*Pteropus gigantius*) is observed inside the forest because of lack of suitable roosting trees, however, they regularly forage this VCF for banana and other fruits occur in the forest. No direct threats are recorded for insectivorous bats, but the Tanchangya community occasionally consumes fruit bats (Indian flying Fox) for meat.

Indian Flying Fox



a) Javan Pipistrelle

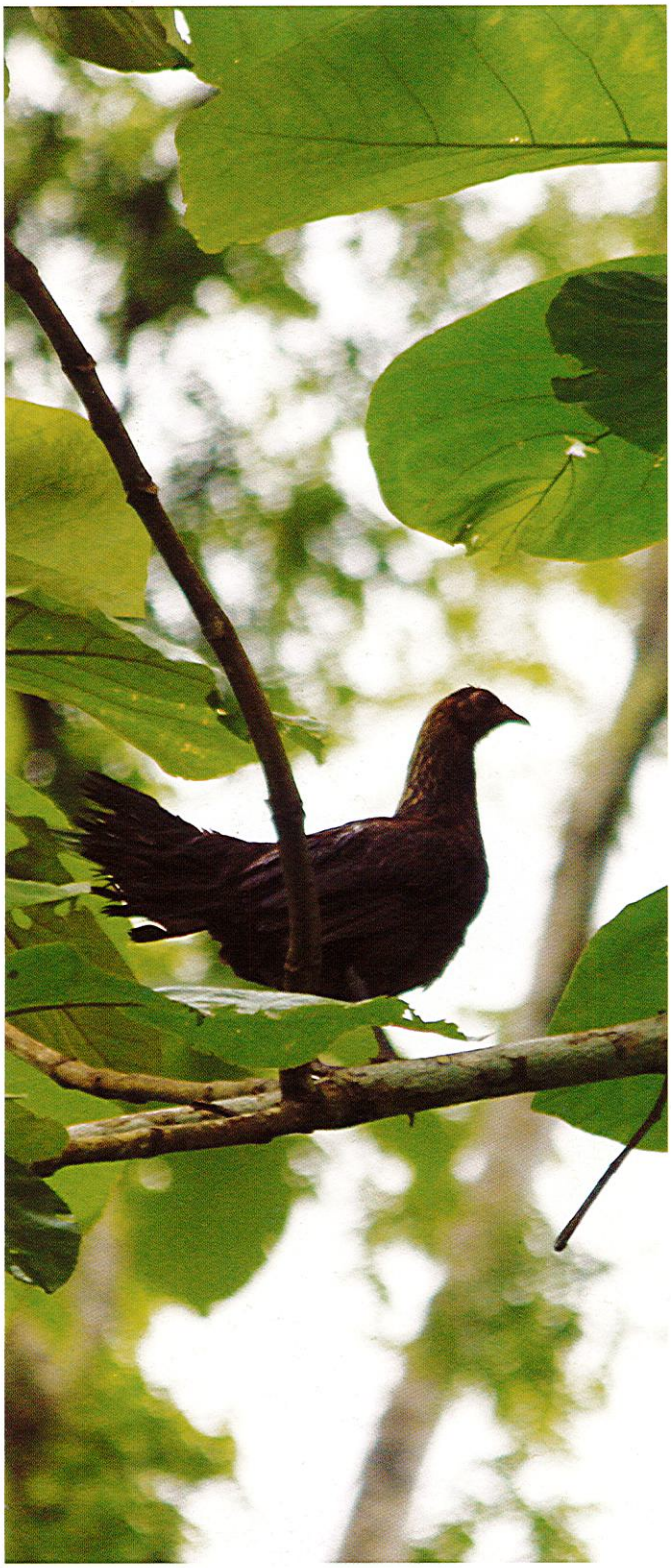
b) Greater Asiatic Yellow House Bat

c) Greater Short-nosed Fruit Bat

Doluchari VCF is a heaven for the rats. The diverse undisturbed habitats support Seven species of rats in the VCF *viz*. Common House Rat *Rattus rattus*, Small House Rat *Mus musculus*, Lesser Bandicoot Rat *Bandicota bengalensis*, and Lesser Bamboo Rat *Cannomys badius*. VCF is the home of locally endemic rat species of Chittagong Hill Tracts. Lesser Bamboo Rat (*Cannomys badius)* are mostly found in the bamboo thickets of southern and western part of the VCF. They are also found in the jhum field areas surrounding the VCF. Lesser Bamboo Rat generally feeds on bamboo shoots and appears in large numbers during the bamboo flowering. Common House Rat (*Rattus rattus*) is found in most of the habitats in and around the households of the VCF and crop lands. Lesser Bandicoot Rat (*Bandicota bengalensis*) is also a common rat found in VCF and surrounding areas. Hills around the VCF are brunt during the jhum cultivation and all the valleys around the VCF go under water during monsoon and in both the cases, all burrowers specifically rats left those areas and take shelter in VCF. Rats play a vital role in food chain of ecosystem as they preyed upon by the raptorial birds like Crested Serpent Eagle, Common Buzzard. Some species of snakes also feed on rats. Local people use some of these rat species (Lesser Bamboo Rat) for medicinal purposes and also consume them regularly.

Assamese Macaque (*Macaca assamensis*) is an Endangered (EN) species according to the IUCN Red List assessment in Bangladesh 2015. Several individuals were seen in DVCF during the field survey. It is notable that DVCF is one of the 4th confirmed sites in Bangladesh where Assamese Macaque still exists.

Assamese Macaque



4.3 Birds

Doluchari VCF consists of luxuriant growth of subtropical mixed evergreen forests, which have been dominated by mostly indigenous trees.The area is a network of natural environment that is relatively well watered, with a number of small moist patches and forest streams. These diverse landscapes share a great floristic diversity, providing many important incites for bird life (such as fruits, seeds, nectar, homestead residues, insects, small mammals, reptiles, and amphibians). It is noteworthy, a total of 188 bird species are found in Doluchari VCF despite of its relatively small area comparable to other government declared protected areas in Chittagong Hill Tracts. Among all species, the relative abundance shows that a total of 96 species are Very Common (51.3%), 54 Common (28.9%), 21 Uncommon (11.2%) and 16 species are Rare (8.6%). Among these, 160 species (85.56%) are resident while 26 species (13.9%) are winter visitor and 1 species is a summer visitor.

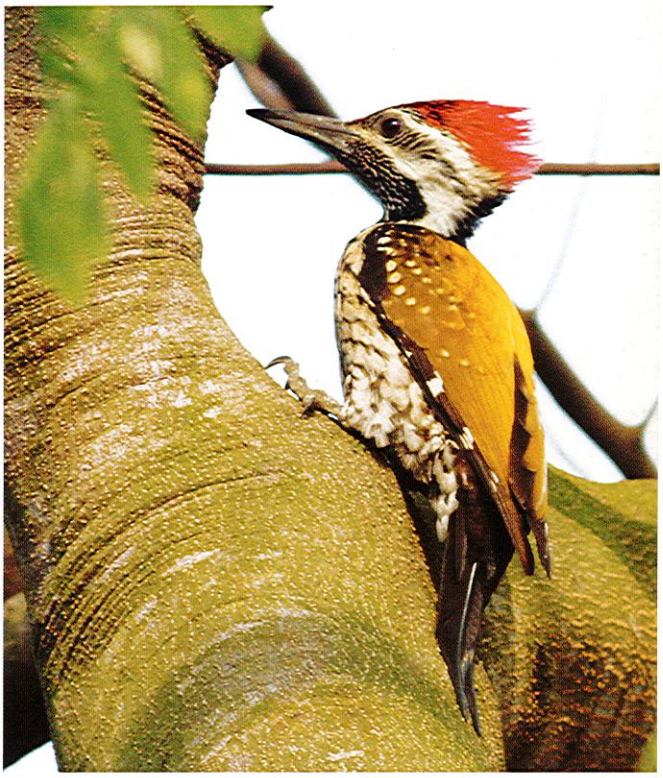
The VCF has a number of trees with a multilayered substantial canopy, as well as bamboo thickets, banana patches and other natural vegetation that exists as bushes. Alternatively, some open agricultural fields and grassland habitat have a number of species and the sites are particularly important for different species of owls among which Collard Scops Owl, Spotted Owlet, Asian Barred Owlet and Barn Owl are very common. They prey on small rodents like rats in these rice fields. Other birds of prey like Shikra, Black Kite, Brahminy Kite, Black-shouldered Kite, Crested Serpent Eagle, Changeable Hawk Eagle are more or less commonly seen around the forest patches along with streams where they can prey on small rodents, frogs and fishes from wetlands nearby. This habitat offers feeding and foraging opportunities to insectivore birds such as the Black Drongo and Blue-tailed Bee-eater which

Red Jungle fowl (female)

mostly feeding on insects. Flowering bushes of forest edges support different species of nectar feeding birds like sunbirds as well as other insectivore birds like flycatchers, warblers.The parasitic cuckoos, Asian Koel, Common Hawk Cuckoo, Indian Cuckoo, Plaintive Cuckoo are also very common. Although cuckoos are relatively difficult to observe, but have loud vocalizations during the breeding season while looking for potential host nests. Different landscapes are correlated with differences in bird species richness, perhaps due to high diversity of plant assemblages including appropriate plant coverage and sites for birds to nest.

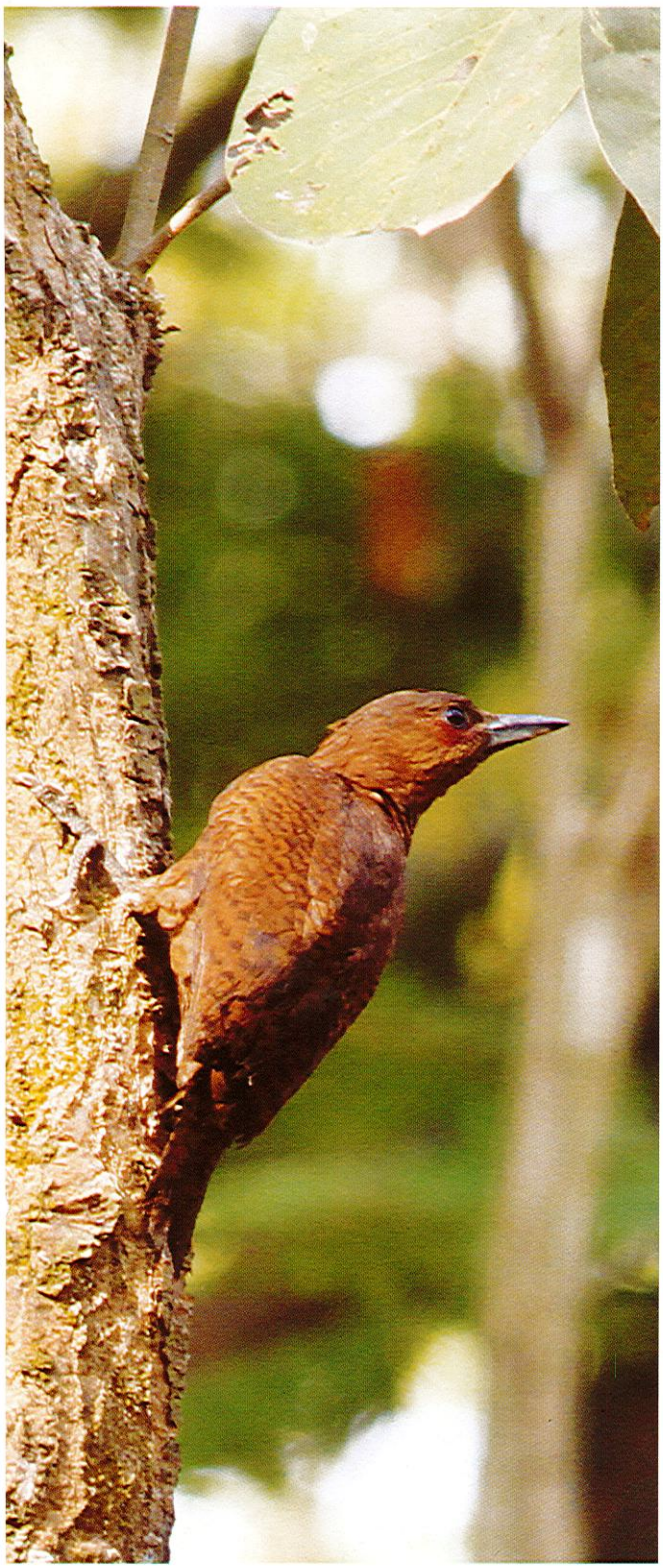
The plant species include nectar-producing flowers, fruit-bearing trees, where frugivorous species like parrots, bulbuls, barbets can feed on. Among these, Rose-ringed Parakeet, Red-breasted Parakeet, Coppersmith Barbet, Lineated Barbet and Blue-throated Barbet are very common. Scattered settlements that are surrounded by a mosaic of vegetation types offer many opportunities for bird foraging and nesting. The most abundant species found both in the nearby homestead orchards and in the VCF are the omnivorous Red-vented Bulbul, Jungle Babbler, Common Myna, Asian Pied Starling, Jungle Myna, Black-hooded Oriole, Rufous Treepie. Nectar-feeders, such as Purple Sunbird, Purple-rumped Sunbird are also abundant. The arboreal sallying insectivorous birds, Asian Paradise-flycatcher, Verditer Flycatcher are commonly seen near forest and forest patches.The foliage-gleaning birds, Rufescent Prinia, Puff-throated Babbler, Abbott's Babbler are frequent in the understory and ground storey of forest patches.

Among the ground dwellers, Red Jungle fowl is the most common species in Doluchari VCF and seemed to be the most adapted to human-dominated landscapes. Common Hoopoe, another ground dweller is very common close to crop lands.



Black-rumped Flameback (top)

Black-rumped Flameback (bottom)



In addition, Kalij Pheasant is associated with open woodlands and scrub vegetation areas where this species can easily access required food and habitat resources. Most probably this species frequently visits this site from the nearby Kaptai National Park. Insectivorous birds which comprise of 68.4% of the total bird species found in the VCF are most abundant in insect-rich landscapes including streamside areas, forests, forest edges and bamboo thicket. Stream side landscapes emerged with the most specialized bird fauna includes Black-backed Forktail that are restricted to streams or creeks. Moreover, 15 species of piscivorous birds (8%) are recorded which include different species of herons, kingfishers and birds of prey largely depend on wetlands for fishes in wetland environments and water bodies. The proximity of agricultural fields to forests is an important factor in influencing bird community composition, with those lands closest to intact forest having higher proportions of frugivorous birds. Indeed, many of the larger frugivorous birds, including Oriental Pied Hornbill, parrots, barbets and pigeons, are often recorded stopping in agricultural sites while on the way across large corridors of agricultural and disturbed habitat to another area of forest.Therefore, the abundance of birds across the different landscapes of this VCF is relatively uniform due to the fact that each landscape offers a range of suitable habitats and food for a range of bird species.

◀ Rufous Woodpecker

Blue-throated Barbet ▶

Birds in Doluchari VCF

Status Code V-Very Common, C-Common, U-Uncommon, and R-Rare;r-Resident (breeds in Bangladesh), w-Winter Visitor (does not breeds in Bangladesh), s-Summer Visitor (breeds in Bangladesh), and v-Vagrant (does not normally breeds in Bangladesh)

English Name	Scientific Name	Status
Order: Galliformes		
Family:Phasianidae		
Red Junglefowl	*Gallus gallus*	V,r
Kalij Pheasant	*Lophura leucomelanos*	R,r
Grey Peacock Pheasant	*Polyplectron bicalcaratum*	R,r
Order: Turniciformes		
Family:Turnicidae		
Barred Buttonquail	*Turnix suscitator*	U,r
Order: Piciformes		
Family:Picidae		
Rufous Woodpecker	*Celeus brachyurus*	V,r
Greater Flameback	*Chrysocolaptes lucidus*	V,r
Grey-capped Pygmy Woodpecker	*Dendrocopos canicapillus*	V,r
Fulvous-breasted Woodpecker	*Dendrocopos macei*	V,r
Black-rumped Flameback	*Dinopium benghalense*	V,r
Lesser Yellownape	*Picus chlorolophus*	U,r
Greater Yellownape	*Picus flavinucha*	C,r
White-browed Piculet	*Sasia ochracea*	U,r
Streak-throated Woodpecker	*Picus xanthopygaeus*	C,r
Eurasian Wryneck	*Jynx torquilla*	C,w
Family: Megalaimidae		
Blue-throated Barbet	*Megalaima asiatica*	V,r
Blue-eared Barbet	*Megalaima australis*	U,r
Coppersmith Barbet	*Megalaima haemacephala*	V,r
Lineated Barbet	*Megalaima lineata*	V,r
Order: Bucerotiformes		
Family: Bucerotidae		
Oriental Pied Hornbill	*Anthracoceros albirostris*	R,r
Order: Upupiformes		
Family: Upupidae		
Common Hoopoe	*Upupa epops*	V,r
Order: Trogoniformes		
Family: Trogonidae		
Red-headed Trogon	*Harpactes erythrocephalus*	R,r

Lineated Barbet (top)

Coppersmith Barbet (bottom)

Oriental Pied Hornbill

Common Kingfisher

White-throated Kingfisher

Indian Roller

Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Order: Coraciiformes		
Family:Coraccidae		
Indian Roller	*Coracias benghalensis*	V,r
Dollarbird	*Eurystomus orientalis*	R,r
Family: Alcedinidae		
Common Kingfisher	*Alcedo atthis*	V,r
Family: Halcyonidae		
White-throated Kingfisher	*Halcyon smyrnensis*	V,r
Stork-billed Kingfisher	*Halcyon capensis*	V,r
Family: Cerylidae		
Pied Kingfisher	*Ceryle rudis*	V,r
Family:Meropidae		
Chestnut-headed Bee-eater	*Merops leschenaulti*	V,r
Green Bee-eater	*Merops orientalis*	V,r
Blue-tailed Bee-eater	*Merops philippinus*	V,r
Blue-bearded Bee-eater	*Nyctyornis athertoni*	R,r
Order: Cuculiformes		
Family:Cuculidae		
Plaintive Cuckoo	*Cacomantis merulinus*	V,r
Banded Bay Cuckoo	*Cacomantis sonneratii*	U,r
Indian Cuckoo	*Cuculus micropterus*	V,r
Pied Cuckoo	*Clamator jacobinus*	C,r
Chestnut-winged Cuckoo	*Clamator coromandus*	U,s
Asian Koel	*Eudynamys scolopaceus*	V,r
Common Hawk Cuckoo	Cuculus varius	V,r
Green-billed Malkoha	*Phaenicophaeus tristis*	V,r
Asian Drongo Cuckoo	*Surniculus lugubris*	U,r
Family:Centropodidae		
Lesser Coucal	*Centropus bengalensis*	C,r
Greater Coucal	*Centropus sinensis*	V.r
Order: Psittaciformes		
Family:Psittacidae		
Vernal Hanging Parrot	*Loriculus vernalis*	U,r
Red-breasted Parakeet	*Psittacula alexandri*	V,r
Rose-ringed Parakeet	*Psittacula krameri*	V,r

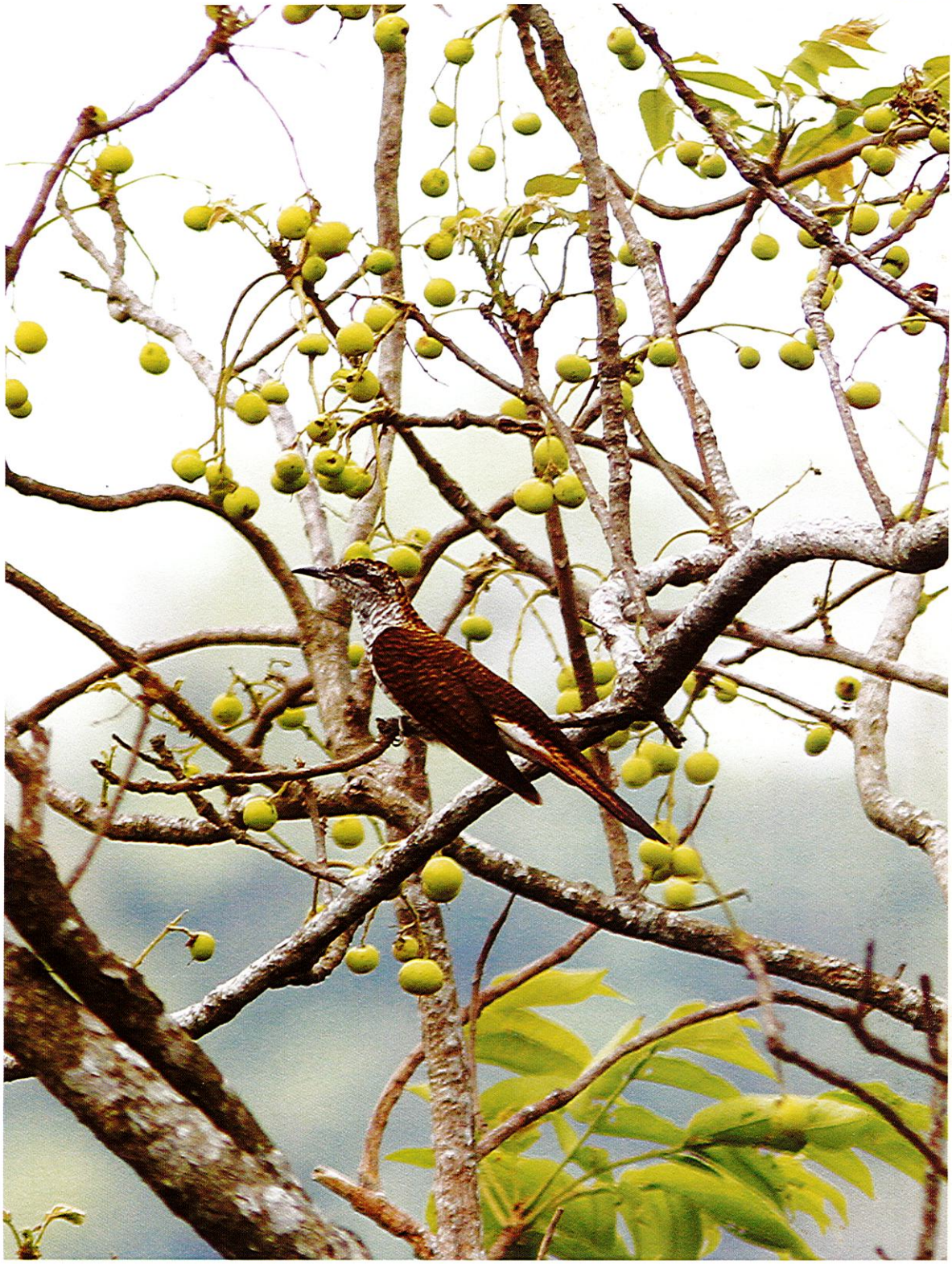
Blue-tailed Bee-eater

Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Order: Apodiformes		
Family:Apodidae		
House Swift	*Apus affinis*	V,r
Asian Palm Swift	*Cypsiurus balasiensis*	V,r
Order: Strigiformes		
Family: Tytonidae		
Barn Owl	*Tyto alba*	V,r
Family:Strigidae		
Spotted Owlet	*Athene brama*	V,r
Asian Barred Owlet	*Glaucidium cuculoides*	R,r
Brown Fish Owl	*Ketupa zeylonensis*	C,r
Brown Hawk Owl	*Ninox scutulata*	C,r
Collared Scops Owl	*Otus bakkamoena*	V,r
Family: Eurostopodidae		
Great Eared Nightjar	*Eurostopodus macrotis*	R,r
Family: Caprimulgidae		
Large-tailed Nightjar	*Caprimulgus macrurus*	R,r
Order: Columbiformes		
Family: Columbidae		
Emerald Dove	*Chalcophaps indica*	C,r
Rock Pigeon	*Columba livia*	V,r
Spotted Dove	*Streptopelia chinensis*	V,r
Oriental Turtle Dove	*Streptopelia orientalis*	U,r
Eurasian Collared Dove	*Streptopelia decaocto*	V,r
Red Collared Dove	*Streptopelia tranquebarica*	V,r
Orange-breasted Green Pigeon	*Treron bicinctus*	U,r
Thick-billed Green Pigeon	*Treron curvirostra*	U,r
Yellow-footed Green Pigeon	*Treron phoenicoptera*	V,r
Pompadour Green Pigeon	*Treron pompadora*	C,r
Family: Accipitridae		
Shikra	*Accipiter badius*	V,r
Besra	*Accipiter virgatus*	U,r
Black Baza	*Aviceda leuphotes*	U,r
Jerdon's Baza	*Aviceda jerdoni*	R,r
Black-shouldered Kite	*Elanus caeruleus*	V,r
Brahminy Kite	*Haliastur indus*	V,r
Black Kite	*Milvus migrans*	V,r
Oriental Honey-buzzard	*Pernis ptilorhyncus*	C,r

◀ Chestnut-winged Cuckoo

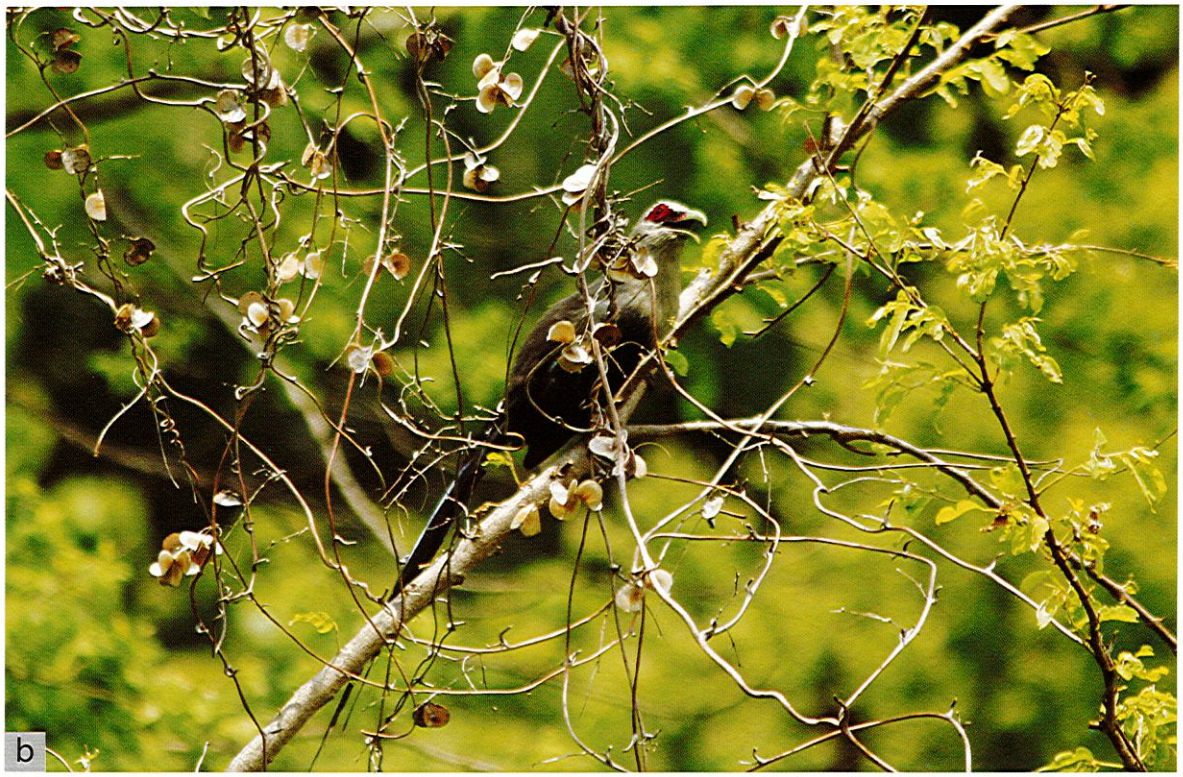
Banded Bay Cuckoo ▶



Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Crested Serpent Eagle	*Spilornis cheela*	V,r
Changeable Hawk Eagle	*Spizaetus cirrhatus*	C,r
Grey-headed Fish Eagle	*Ichthyophaga ichthyaetus*	C,r
Osprey	*Pandion haliaetus*	V,w
Family: Falconidae		
Common Kestrel	*Falco tinnunculus*	V,w
Family: Ardeidae		
Grey Heron	*Ardea cinerea*	C,r
Indian Pond Heron	*Ardeola grayii*	V,r
Cattle Egret	*Bubulcus ibis*	V,r
Little Heron	*Butorides striata*	C,r
Great Egret	*Casmerodius albus*	V,r
Intermediate Egret	*Mesophoyx intermedia*	C,r
Little Egret	*Egretta garzetta*	V,r
Cinnamon Bittern	*Ixobrychus cinnamomeus*	U,r
Order:Passeriformes		
Family: Irenidae		
Golden-fronted Leafbird	*Chloropsis aurifrons*	V,r
Blue-winged Leafbird	*Chloropsis cochinchinensis*	R,r
Asian Fairy Bluebird	*Irena puella*	U,r
Family: Laniidae		
Long-tailed Shrike	*Lanius schach*	V,r
Brown Shrike	*Lanius cristatus*	V,w
Grey-backed Shrike	*Lanius tephronotus*	V,w
Family: Corvidae		
Large-billed Crow	*Corvus macrorhynchos*	V,r
House Crow	*Corvus splendens*	V,r
Grey Treepie	*Dendrocitta formosae*	R,r
Rufous Treepie	*Dendrocitta vagabunda*	C,r
Common Iora	*Aegithina tiphia*	V,r
Ashy Woodswallow	*Artamus fuscus*	V,r
Bronzed Drongo	*Dicrurus aeneus*	C,r
Spangled Drongo	*Dicrurus hottentottus*	C,r
Black Drongo	*Dicrurus macrocercus*	V,r
Ashy Drongo	*Dicrurus leucophaeus*	C,w
Greater Racket-tailed Drongo	*Dicrurus paradiseus*	V,r
Lesser Racket-tailed Drongo	*Dicrurus remifer*	U,w
Large Cuckooshrike	*Coracina macei*	C,r

a) Common Hawk Cuckoo
b) Green-billed Malkoha
c) Greater Coucal



b

c

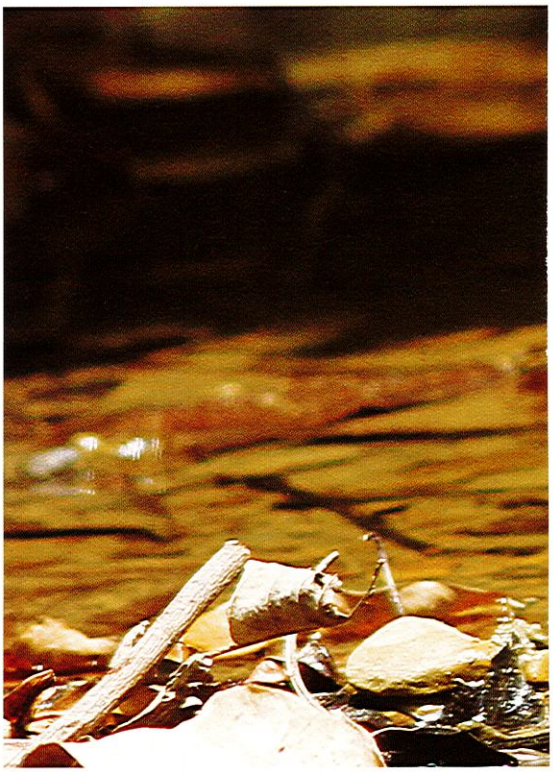
Red-breasted Parakeet

Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Black-headed Cuckooshrike	*Coracina melanoptera*	V,r
Black-winged Cuckooshrike	*Coracina melaschistos*	U,w
Black-hooded Oriole	*Oriolus xanthornus*	V,r
Black-naped Oriole	*Oriolus chinensis*	U,w
Black-naped Monarch	*Hypothymis azurea*	V,r
Ashy Minivet	*Pericocotus divaricatus*	R,w
Small Minivet	*Pericrocotus cinnamomeus*	V,r
Rosy Minivet	*Pericrocotus roseus*	U,w
Scarlet Minivet	*Pericrocotus flammeus*	C,r
Large Woodshrike	*Tephrodornis virgatus*	C,r
Common Woodshrike	*Tephrodornis pondicerianus*	V,r
Asian Paradise-flycatcher	*Terpsiphone paradisi*	C,r
White-throated Fantail	*Rhipidura albicollis*	V,r
Family: Muscicapidae		
White-rumped Shama	*Copsychus malabaricus*	V,r
Pale-chinned Flycatcher	*Cyornis poliogenys*	C,r
Oriental Magpie Robin	*Copsychus saularis*	V,r
Black-backed Forktail	*Enicurus immaculatus*	V,r
Blue Whistling Thrush	*Myophonus caeruleus*	U,w
Orange-headed Thrush	*Zoothera citrina*	V,r
Verditer Flycatcher	*Eumyias thalassina*	C,w
Taiga Flycatcher	*Ficedula albicilla*	V,w
Pied Bushchat	*Saxicola caprata*	V,r
Common Stonechat	*Saxicola torquata*	V,w
Black Redstart	*Phoenicurus ochruros*	C,w
Family: Sturniidae		
Jungle Myna	*Acridotheres fuscus*	V,r
Common Myna	*Acridotheres tristis*	V,r
Bank Myna	*Acridotheres ginginianus*	C,r
Hill Myna	*Gracula religiosa*	R,r
Asian Pied Starling	*Sturnus contra*	V,r
Chestnut-tailed Starling	*Sturnus malabaricus*	V,r
Family: Sturniidae		
Great Tit	*Parus major*	V,r
Family: Hirundinidae		
Barn Swallow	*Hirundo rustica*	V,w
Plain Martin	*Riparia paludicola*	C,r

White-rumped Shama

Black-backed Forktail



Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Family: Hirundinidae		
White-throated Bulbul	*Alophoixus flaveolus*	V,r
Olive Bulbul	*Iole virescens*	C,r
Red-vented Bulbul	*Pycnonotus cafer*	V,r
Red-whiskered Bulbul	*Pycnonotus jocosus*	V,r
Black-crested Bulbul	*Pycnonotus melanicterus*	C,r
Family: Cisticolidae		
Zitting Cisticola	*Cisticola juncidis*	V,r
Grey-breasted Prinia	*Prinia hodgsonii*	C,r
Plain Prinia	*Prinia inornata*	C,r
Rufescent Prinia	*Prinia rufescens*	C,r
Family: Zosteropidae		
Oriental White-eye	*Zosterops palpebrosus*	V,r
Family: Sylviidae		
Lesser Necklaced Laughingthrush	*Garrulax monileger*	R,r
Greater Necklaced Laughingthrush	*Garrulax pectoralis*	V,r
Rufous-necked Laughingthrush	*Garrulax ruficollis*	C,r
Pin-striped Tit Babbler	*Macronous gularis*	C,r
Grey-throated Babbler	*Stachyris nigriceps*	U,r
Abbott's Babbler	*Malacocincla abbotti*	C,r
Puff-throated Babbler	*Pellorneum ruficeps*	C,r
White-browed Scimitar Babbler	*Pomatorhinus schisticeps*	R,r
Jungle Babbler	*Turdoides striata*	V,r
Striated Babbler	*Turdoides earlei*	C,r
Striated Grassbird	*Megalurus palustris*	C,r
Common Tailorbird	*Orthotomus sutorius*	V,r
Dusky Warbler	*Phylloscopus fuscatus*	C,w
Greenish Warbler	*Phylloscopus trochiloides*	C,w
Blyth's Reed Warbler	*Acrocephalus dumetorum*	V,w
Clamorous Reed Warbler	*Acrocephalus stentoreus*	C,w
Family: Alaudidae		
Rufous-winged Bushlark	*Mirafra assamica*	V,r
Oriental Skylark	*Alauda gulgula*	C,r
Family: Nectariniidae		
Crimson Sunbird	*Aethopyga siparaja*	C,r
Ruby-cheeked Sunbird	*Chalcoparia singalensis*	C,r
Purple Sunbird	*Cinnyris asiaticus*	V,r
Purple-rumped Sunbird	*Leptocoma zeylonica*	V,r

Asian Barred Owlet

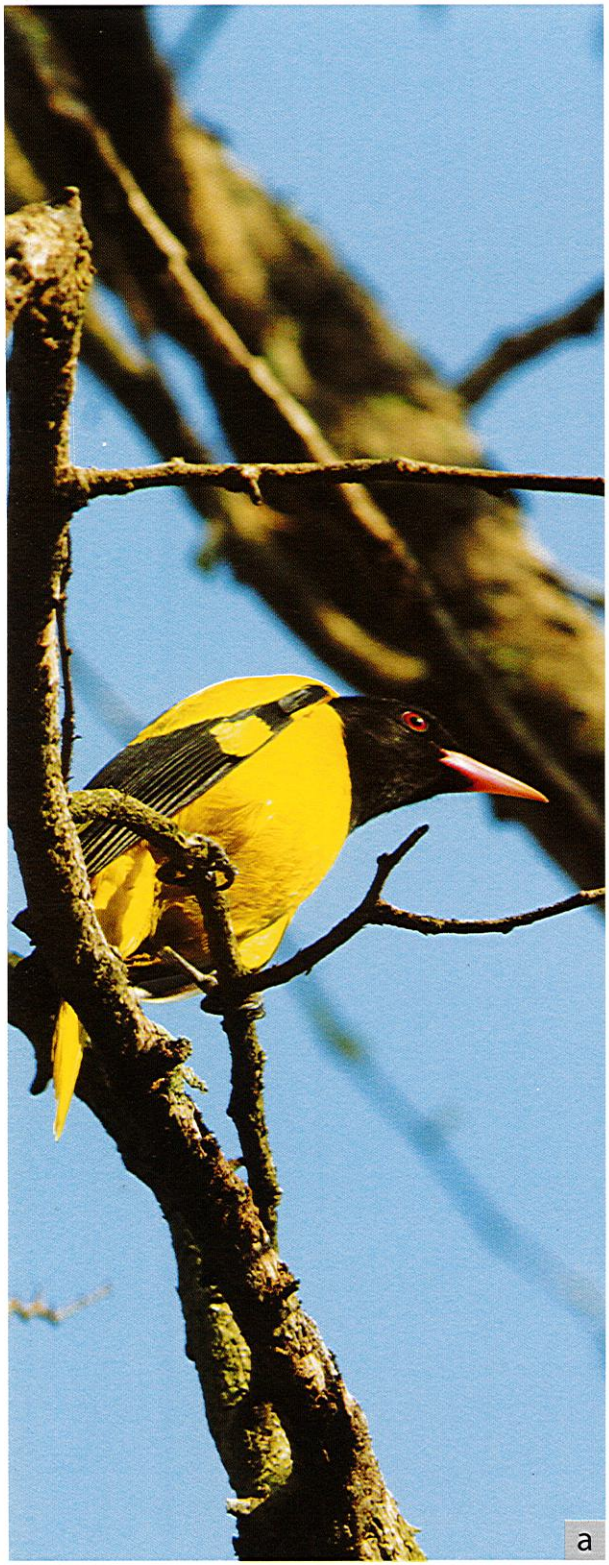
Grey-headed Fish Eagle

Birds in Doluchari VCF (continued)

English Name	Scientific Name	Status
Little Spiderhunter	*Arachnothera longirostra*	C,r
Thick-billed Flowerpecker	*Dicaeum agile*	C,r
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	V,r
Pale-billed Flowerpecker	*Dicaeum erythrorhynchos*	C,r
Family: Passeridae		
Paddyfield Pipit	*Anthus rufulus*	C,r
Olive-backed Pipit	*Anthus hodgsoni*	C,w
Indian Silverbill	*Lonchura malabarica*	V,r
Black-headed Munia	*Lonchura malacca*	V,r
Scaly-breasted Munia	*Lonchura punctulata*	V,r
White-rumped Munia	*Lonchura striata*	C,r
House Sparrow	*Passer domesticus*	V,r
Baya Weaver	*Ploceus philippinus*	V,r
White-browed Wagtail	*Motacilla maderaspatensis*	V,r
White Wagtail	*Motacilla alba*	V,w
Grey Wagtail	*Motacilla cinerea*	C,w
Citrine Wagtai	*Motacilla citreola*	C,w
Yellow Wagtail	*Motacilla flava*	C,w

Golden-fronted Leafbird

Little Cormorant



a) Black-hooded Oriole

b) Common Iora

c) Black Drongo

d) Hair-crested Drongo

e) Greater Racket-tailed Drongo

c

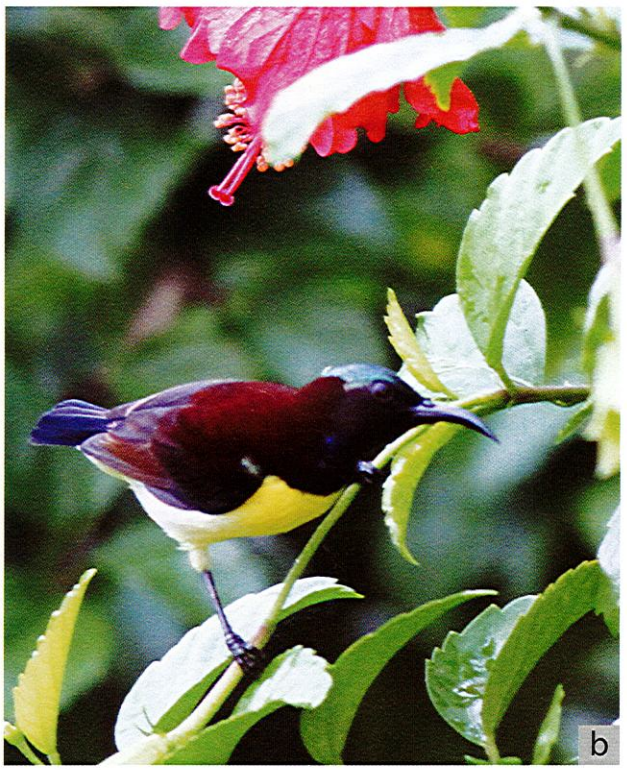
d

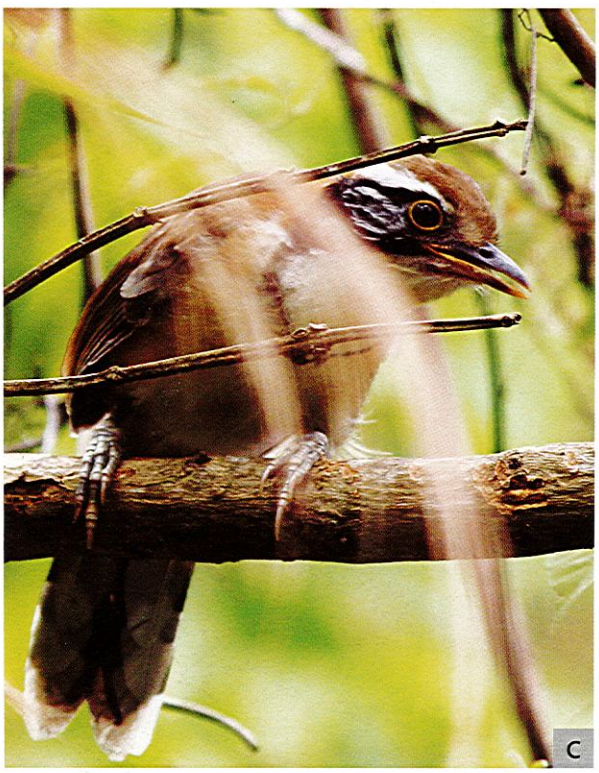
e

White-throated Bulbul

Black-crested Bulbul

Common Tailorbird



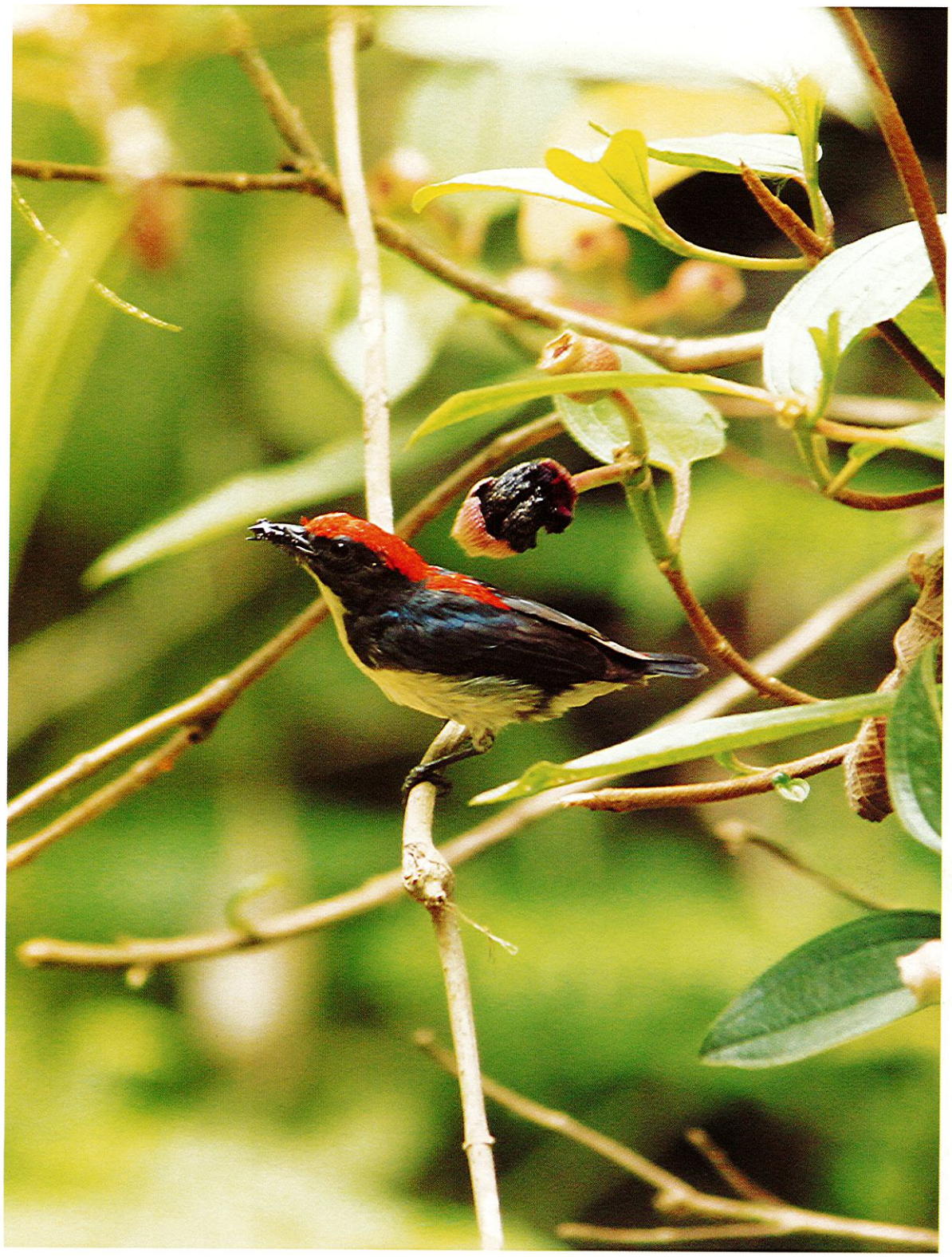


a) Rufescent Prinia

b) Purple-rumped Sunbird

c) Greater Necklaced Laughingthrush

Scarlet-backed Flowerpecker



a) Zitting Cisticola

b) Pied Bushchat

c) Bengal Bushlark

d) Scally-breasted Munia

e) Baya Weaver

f) White-rumped Munia


d


e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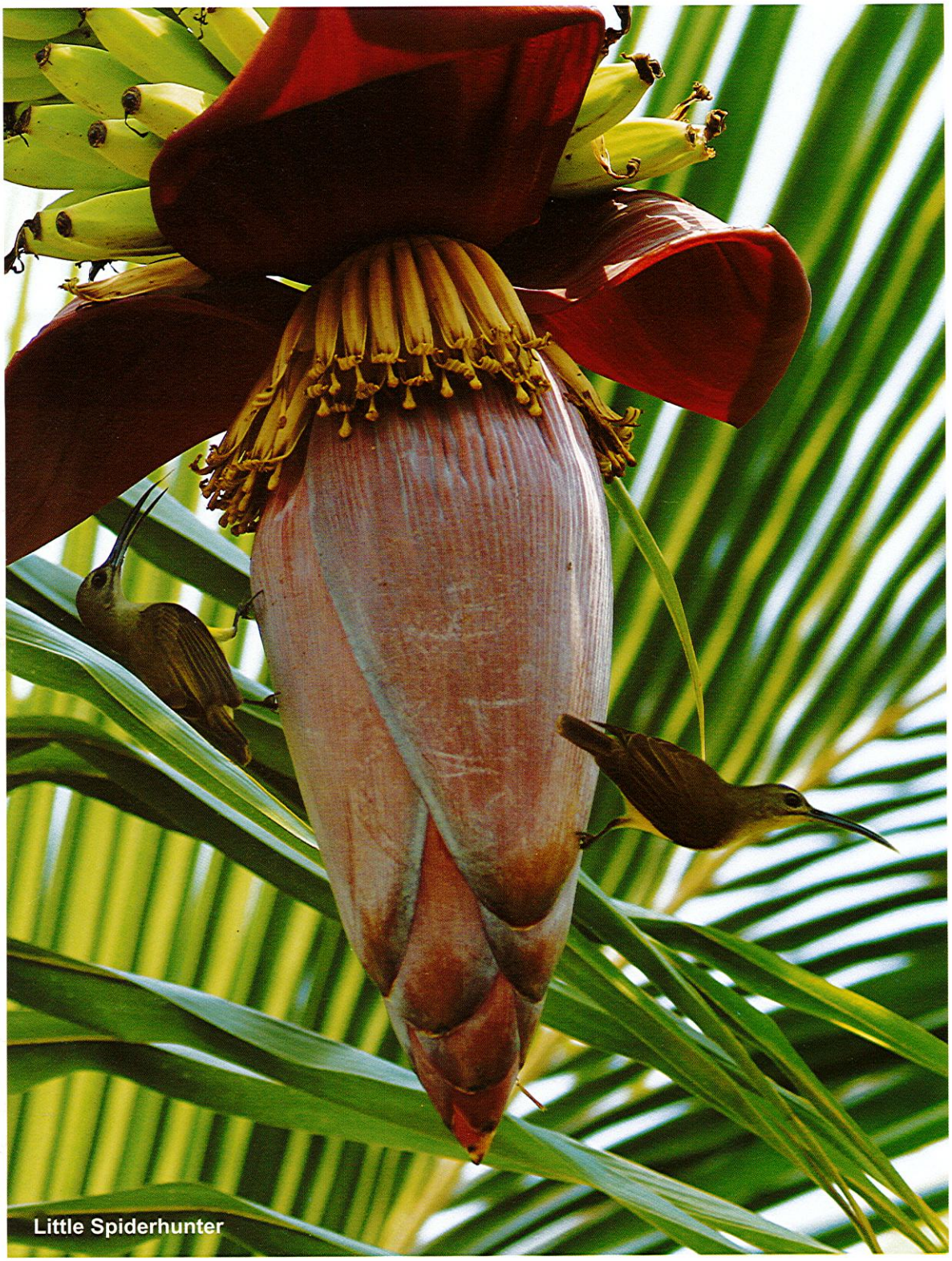
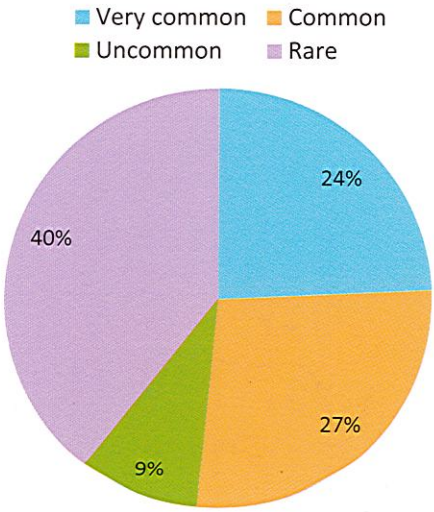


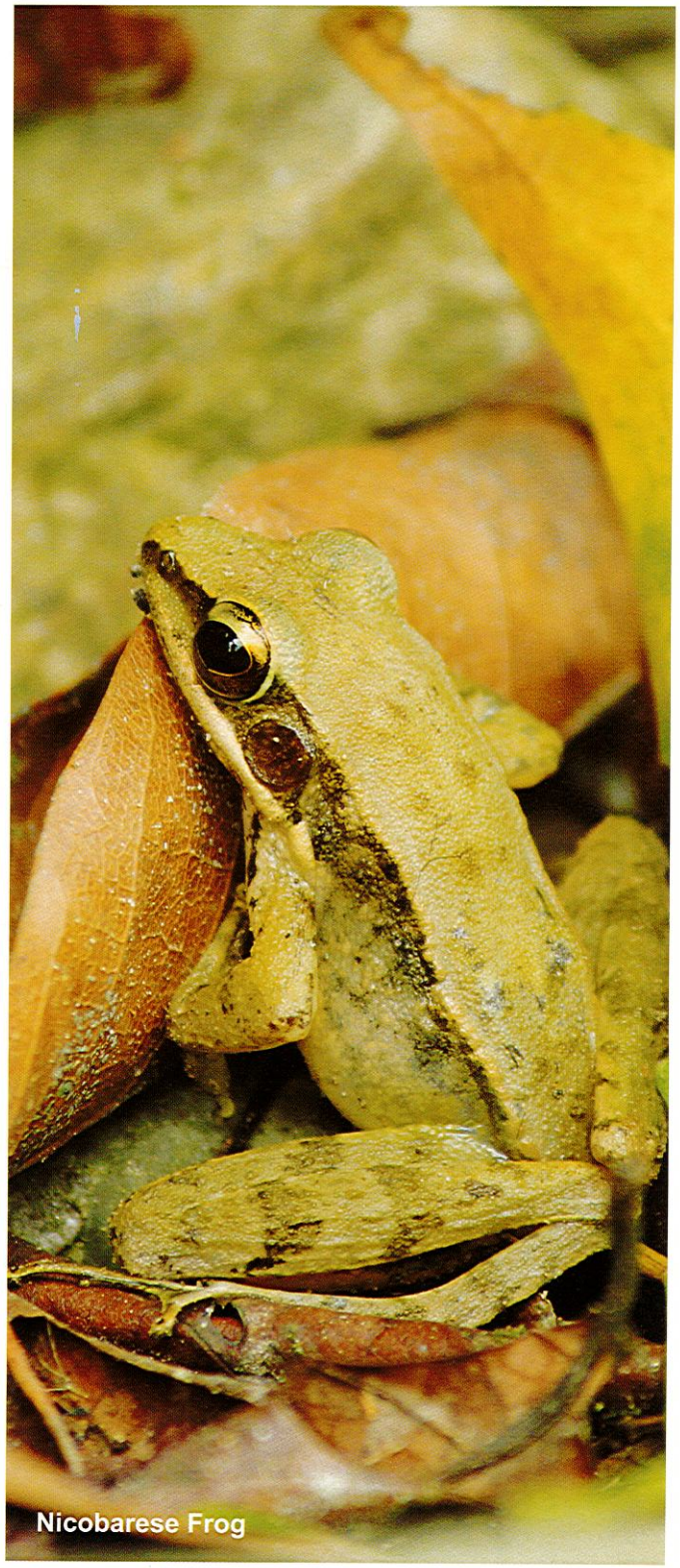
Little Spiderhunter

4.4 Amphibians and Reptiles

Doluchari Village Common Forest provides diverse habitats for amphibians and reptiles. The villagers do not practice any *Jhum* Cultivation in VCF area, thus there is no intentional firing happens here. Amphibians and reptiles population in VCF enjoy constant suitable habitats within VCF area throughout the year. Moreover, nearby hills of VCF have extensively been using for *Jhum* Cultivation and other agricultural practices. Herpetofauna as well as other mammals from those disturbed hills take shelter to VCF. A total of 33 species of amphibians were recorded from this VCF of which 40% (13 species) are rare, 9% (3 species) uncommon, 27% (9 species) common and 24% (8 species) are very common.



Many of the amphibian species found in this VCF are very rare in other forests in Chittagong and Chittagong Hill Tracts. Nicobarese Frog (*Hylarana nicobarensis*) has been recorded as Data Deficient in Bangladesh (IUCN-Bangladesh 2015) as its previous record was only from Ruma, Bandarban and Dudpukuria-Dhopachari Wildlife Sanctuary. Nicobarese Frog is common in the forest floors and breeding pools of this VCF.


Nicobarese Frog

Though the population of Crown Frog (*Xenophrys parva*), Point-nosed Frog (*Clinotarsus alticola*) and Painted Bull Frog (*Kaloula pulchra*) are rare in many of the hill forests in CHT but their populations in this VCF are notable.

As the VCF has been managing primarily for the conservation of watershed, the small water streams provide water to this VCF throughout the year even in the dry months whereas the water streams in nearby hills dry up during that time. The availability of water throughout the year is the lifeline of this VCF which eventually enrich the biodiversity of Doluchari VCF. Two big water streams (Doluchari chara and Kukujjyachari chara) drain out a huge volume of water to the Kaptai Lake during monsoon. Many deep ditches are created in these water streams due to huge water runoff during wet season. Those ditches hold deep water during dry months and attract many mammalian species for drinking water source; turtles, fishes and crustaceans for their shelter as well as amphibians for breeding pools. Amphibians use the main stream water when the monsoon rain is over, because all the eggs and tadpoles may washout during heavy rain. The late seasonal breeder frogs, such as Point-nosed Frog (*Clinotarsus alticola*), Marbled Cascade Frog (*Amolops marmoratus*) and Crown Frog (*Xenophrys parva*) as well as the only winter breeder frog of Bangladesh, Berdmore's Microhylid Frog (*Microhyla berdmorei*) use these deep portion of the streams as their breeding pools. A large number of tadpoles are found in these pools during late winter season. As these breeding pools continuously get little water flow from the source, the tadpoles gets continuous flow of nutrients as well. Moreover, these water pools are rich with zooplankton and water insects; those provide sufficient nutrients to the growing tadpoles.

On the other hand, there are paddy fields and open spaces near the VCF areas and seasonal rain water creates breeding pool for other amphibian species. Skipper Frog (*Euphlyctis cyanophlyctis*), Cricket Frogs (*Fejervarya* spp.), Indian Bull Frog (*Hoplobatrachus tigerinus*), Coastal Bull Frog (*Hoplobatrachus litoralis*),

Crown Frog

Puddle Frog (*Occidozuga lima*) and Ornate Microhylid Frog (*Microhyla ornata*) use these seasonal breeding pools. Forest dwelling frogs, such as Cope's Frog (*Hylarana leptoglossa*), Nicobarese Frog (*Hylarana nicobariensis*), Painted Bull Frog (*Kaloula pulchra*) and Smith's Litter Frog (*Leptobrachium smithi*) use seasonal water bodies near the periphery of the VCF. Tree frogs *viz.* Indian Tree Frog (*Polypedates maculates*), Six-lined Tree Frog (*Polypedates leucomystax*), Two-striped Pigmy Tree Frog (*Chiromantis vittatus*) and Annandale Tree Frog (*Chiromantis simus*) are found to breed bushes and tree branches hanging over the water pool. Breeding of other two tree frog species *viz.* Dwarf Bush Frog (*Philautus parvulus*) and Anderson's Bush Frog (*Philautus andersoni*) are different where the tadpole stage is absent. Their developmental stages complete within the eggs. Thus, their eggs are comparatively larger in size and they do not need water pool for their breeding but they need enough moisture/rain water to keep their eggs wet. They fix their eggs underside of the leaves to protect them from the predators.

Doluchari VCF supports diverse reptile habitats. The bushy areas, large trees, water streams, hills, a nearby huge fresh water lake support a large number of reptilian species. The villagers do not harvest large scale fuel wood from the VCF. Thus the leaf litters and fallen logs enrich the forest floor for herpetofauna especially for skinks and fossorial amphibians. The availability of amphibians and small lizard populations as well as rodents ensures the abundance of different species of snakes. The water streams throughout the VCF is also rich with small fish and crustaceans, those provide food to the water snakes and turtles.

A total of 61 species of reptiles have been recorded from this VCF of which six species are turtles and tortoise, 22 species lizards and 33 species snakes. Among the lizards, 7 species of geckos, 8 species of skinks, 4 species of agamids and 3 species of monitor lizards are found here. Among the snakes found in this VCF, 24 species are non-venomous and 8 species are venomous.

A good population of forest dwelling lizards such as Emma Gray's Forest Lizard (*Calotes emma*), Green Fan-throated Lizard (*Ptyctolaemus gularis*), Khasi Hills Long-tailed Lizard (*Takydromus khasiensis*) and Spotted Litter Skink (*Sphenomorphus maculates*) are found in this VCF. The occurrence of these rare species in VCF area indicates the presence of good forest habitats in VCF. A good number of snakes are found in Doluchari VCF, though hunting of snakes for consumption was also evident.

Common Asian Toad

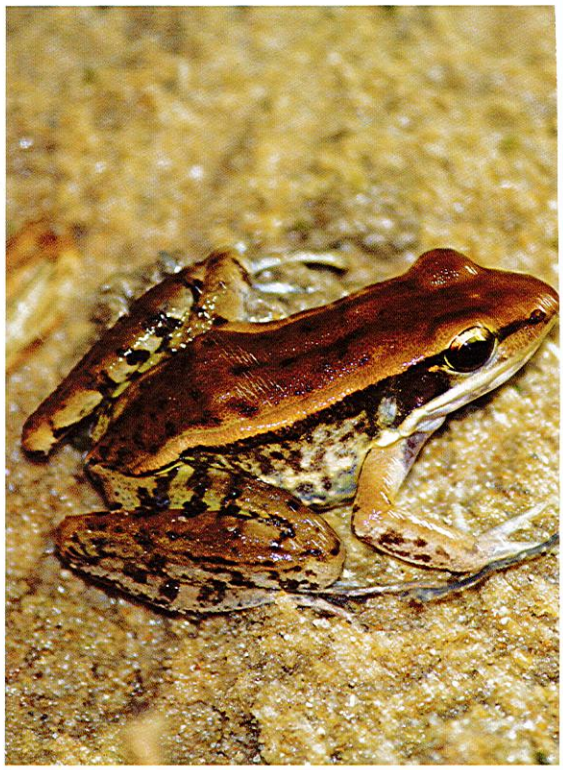
Status of Amphibians in Doluchari VCF

Status Code: V- Very Common, C- Common, U- Uncommon, and R- Rare

English Name	Scientific Name	Status
Order: Anura		
Family: Bufonidae		
Common Toad	*Duttaphrynus melanostictus*	V
Family: Dicroglossidae		
Skipper Frog	*Euphlyctis cyanophlyctis*	V
Coastal Bull Frog	*Hoplobatrachus litoralis*	U
Indian Bull Frog	*Hoplobatrachus tigerinus*	C
Jerdon's Bull Frog	*Hoplobatrachus crassus*	R
Pierre's Cricket Frog	*Fejervarya pierrei*	V
Syhadra Cricket Frog	*Fejervarya syhadrensis*	V
Asmat's Cricket Frog	*Fejervarya asmati*	C
Terai Cricket Frog	*Fejervarya teraiensis*	V
Crab-eating Frog	*Fejervarya cancrivora*	C
Northern Frog	*Occidozyga borealis*	R
Puddle Frog	*Occidozyga lima*	R
Family: Megophrydae		
Crown Frog	*Xenophrys parva*	U
Smith's Litter Frog	*Leptobrachium smithi*	R
Family: Microhylidae		
Red Microhylid Frog	*Microhyla rubra*	R
Ornate Microhylid Frog	*Microhyla ornata*	V
Berdmore's Microhylid Frog	*Microhyla berdmorei*	V
Chittagong Microhylid Frog	*Microhyla mukhlesuri*	C
Painted Bull Frog	*Kaloula pulchra*	R
Family: Ranidae		
Point-nosed Frog	*Clinotarsus alticola*	R
Bhamo Frog	*Humerana humeralis*	C
Marbled Cascade Frog	*Amolops marmoratus*	R
Cope's Assam Frog	*Hylarana leptoglossa*	C
Two-striped grass frog	*Hylarana taipehensis*	C
Yellow-striped Frog	*Hylarana tytleri*	C
Nicobarese frog	*Hylarana nicobariensis*	U
Family: Rhacophoridae		
Indian Tree Frog	*Polypedates maculatus*	R
Six-lined Tree Frog	*Polypedates leucomystax*	V
Twin-spotted Tree Frog	*Rhacophorus bipunctata*	R
Two-striped Pigmy Tree Frog	*Chiromantis vittatus*	C
AnnandaleTree Frog	*Chiromantis simus*	R
Dwarf Bush Frog	*Philautus parvulus*	R
Anderson's Bush Frog	*Philautus andersoni*	R

Point-nosed Frog


a



a) Common Tree Frog

b) Cope's Assam Frog

c) Northen Trickle Frog

d) Two-striped Grass Frog

e) Asian Painted Frog

f) Terai Cricket Frog

g) Smith's Litter Frog

Common Garden Lizard

Emma Gray's Forest Lizard

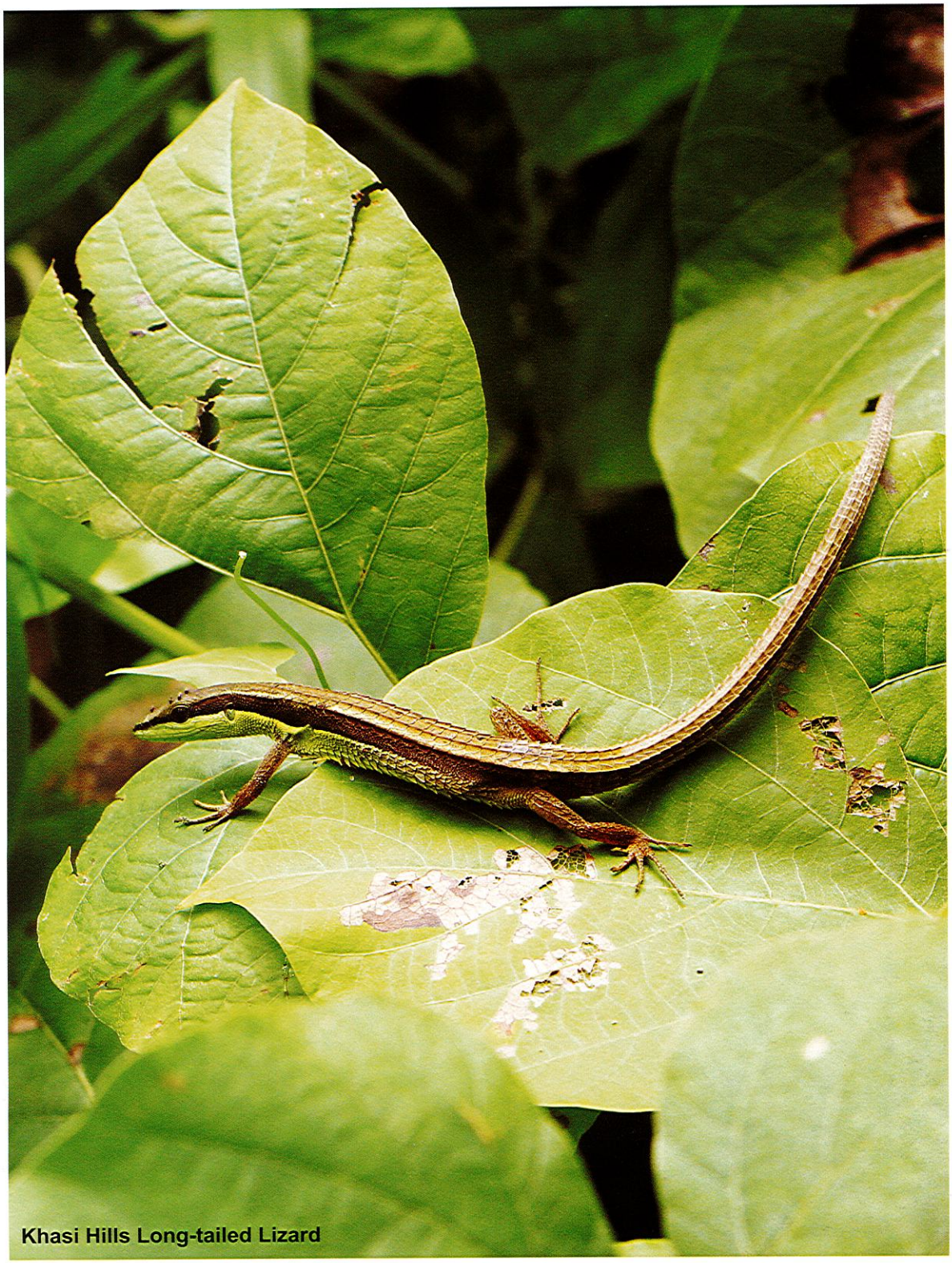
Green Fan-throated Lizard


Flat-tailed Gecko

Status of Reptiles in Doluchari VCF

Status Code: V- Very Common, C- Common, U- Uncommon, and R- Rare

English Name	Scientific Name	Status
Order: Testudinea		
Family: Bataguridae		
Malayan Box Turtle	*Cuora amboinensis*	R
Indian leaf turtle	*Cyclemys gemeli*	R
Indian Roofed Turtle	*Pangshura tectum*	C
Family: Testudinidae		
Elongated Tortoise	*Indotestudo elongata*	R
Family: Trionychidae		
Spotted Flap Shell Turtle	*Lissemys punctata*	C
Family: Geoemydidae		
Yellow Turtle	*Morenia petersi*	R
Order: Lacertilia		
Family: Agamidae		
Common Garden Lizard	*Calotes versicolor*	V
Emma Gray's Forest Lizard	*Calotes emma*	C
Green Fan-throated Lizard	*Ptyctolaemus gularis*	R
Spotted Flying lizard	*Draco maculatus*	R
Family: Gekkonidae		
Common House Gecko	*Hemidactylus frenatus*	V
Bowring's House Gecko	*Hemidactylus bowringii*	C
Brook's House Gecko	*Hemidactylus brookii*	C
Flat-tailed Gecko	*Hemidactylus platyurus*	C
Garnot's Gecko	*Hemidactylus garnotii*	R
Tokay Gecko	*Gekko gecko*	V
Khasi Hills Bent-Toed Gecko	*Cyrtodactylus ayeyarwadyensis*	R
Family: Scincidae		
Bronze Grass Skink	*Eutropis macularia*	V
Keeled Grass Skink	*Eutropis carinata*	C
Many-lined Grass Skink	*Mabuya multifasciata*	R
Spotted Litter Skink	*Sphenomorphus maculatus*	C
Reeve's Ground Skink	*Scincella reevesi*	R
White-Spotted Supple Skink	*Lygosoma albopunctata*	R
Bowring's Supple Skink	*Lygosoma bowringii*	R
Family: Lacertidae		
Khasi Hills Long-tailed Lizard	*Takydromus khasiensis*	R
Family: Varanidae		
Ring Lizard	*Varanus salvator*	R
Bengal Monitor	Varanus bengalensis	C
Yellow Monitor	*Varanus flavescens*	R



Khasi Hills Long-tailed Lizard

a) Spotted Litter Skink

b) Many-lined Grass Skink

c) Jerdon's Worm Snake

d) Indo-chinese Rat Snake

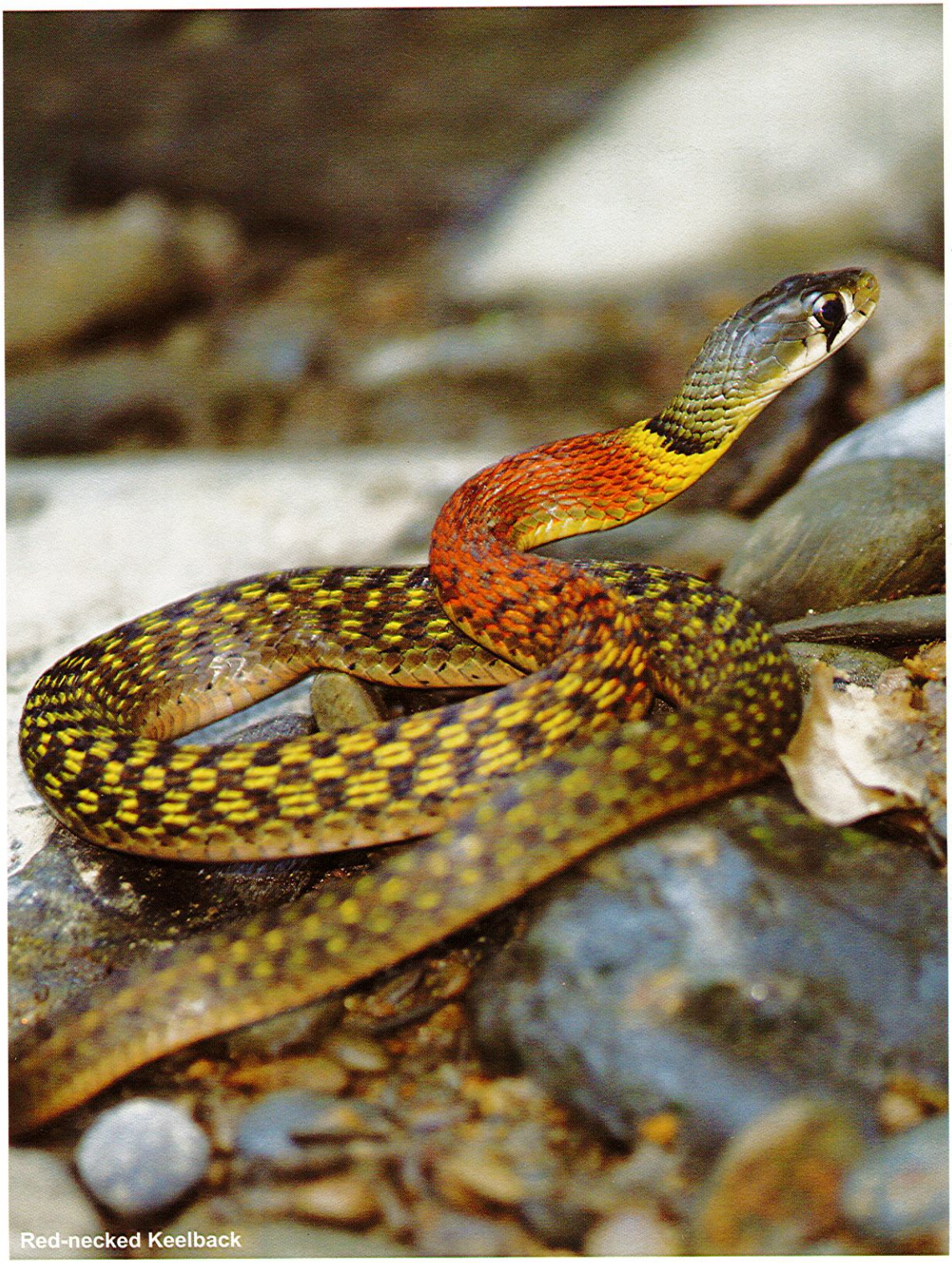
e) White-lipped Pit Viper

Status of Reptiles in Doluchari VCF

English Name	Scientific Name	Status
Order: Serpentes		
Family:Typhlopidae		
Diard's Blind Snake	*Typhlops diardii*	R
Common Blind Snake	*Ramphotyphlops braminus*	C
Jerdon's Worm Snake	*Typhlops jerdoni*	R
Family: Boidae		
Rock Python	*Python molurus*	R
Family: Colubridae		
Common Vine Snake	*Ahaetulla nasuta*	C
Short-nosed Vine Snake	*Ahaetulla prasina*	R
Tawny Cat Snake	*Boiga ochracea*	R
Green Cat Snake	Boiga cyanea	R
Striped Keelback	*Amphiesma stolatum*	C
Ornate Flying Snake	*Chrysopelea ornata*	R
Painted Bronzeback Tree Snake	*Dendrelaphis pictus*	C
Common Bronzeback Tree Snake	*Dendrelaphis tristis*	R
Indian Rat Snake	*Coluber mucosus*	C
Indo-Chinese Rat Snake	*Ptyas korros*	R
Common Trinket Snake	*Coelognathus helenus*	R
Common Smooth Water Snake	*Enhydris enhydris*	V
Spot-tailed Kukri Snake	*Oligodon dorsalis*	R
White-barred Kukri Snake	*Oligodon albocinctus*	R
Russell's Kukri Snake	*Oligodon taeniolatus*	R
Common Wolf Snake	*Lycodon aulicus*	C
Zaw's Wolf Snake	*Lycodon zawi*	R
Yellow-speckled Wolf Snake	*Lycodon jara*	R
Checkered Keelback	*Xenochrophis piscator*	V
Red-necked Keelback	*Rhabdophis subminiatus*	R
Cherrapunji Keelback	*Amphiesma xenura*	R
Mock Viper	*Psammodynastes pulverulentus*	R
Family: Elapidae		
Banded Krait	*Bungarus fasciatus*	C
Common Krait	*Bungarus caeruleus*	R
Black Krait	*Bungarus niger*	R
Spectacled Cobra	*Naja naja*	C
Monocled Cobra	*Naja kaouthia*	C
King Cobra	*Ophiophagus hannah*	R
Family: Viperidae		
White-lipped Pit Viper	*Trimeresurus albolabris*	R

Cherrapunji Keelback

Tawny Cat Snake



Red-necked Keelback


Caterpillar (unknown)

4.5. Invertebrates

Doluchari VCF is just a tiny segment of naturally grown forested area in Rangamati district. Like other Village Common Forests in Chittagong Hill Tracts, Doluchari VCF is also managed by local inhabitants living nearby. Aside its negligible area, habitats of Doluchari VCF supports tremendous invertebrate population. Butterflies, Moths, Dragonflies and Damselflies, Beeltes, Spiders, Crabs, Grasshoppers etc are some common insect communities which are innumerable in this VCF.

About 102 species of butterflies are recorded from this VCF. Available nectar yielding vegetation, enough larval food plants, two rocky streams, numerous stagnant water sources, sandy soil for puddling etc. are some habitat characteristics of Doluchari VCF. As a result various common and endangered butterflies can easily be seen in this VCF year round. To maintain a healthy forest ecosystem role of butterfly is undeniable. They are the best pollinators among all insect communities. Their endless flight from flowers to flowers contributes to the regeneration of forest flora in long run.

Many threatened species of butterflies of the country like Tawny Rajah, Black Rajah, Common Imperial, Common Maplet, Redspot Duke, Common Bluebottle, Great Orange Tip, Common Wight, White Dragontail, Dark Archduke, White Bar Bushbrown, Black Prince, Apefly, Clipper, Grey Count etc. are commonly found in this VCF.

Order Odonata (Dragonflies and damselflies) is the least studied group of insects in Bangladesh apart from their huge economic and ecological importance. Adult Odonates are terrestrial and are found near water whereas the immature stages are aquatic and inhabit all types of freshwater habitats ranging from permanent running waters and lakes to small temporary rain pools. Doluchari VCF has all such type of habitat requirements hence supports considerable number of species of odonata fauna. During the study period a total of 32 species of dragonflies and damselflies were found in this VCF.

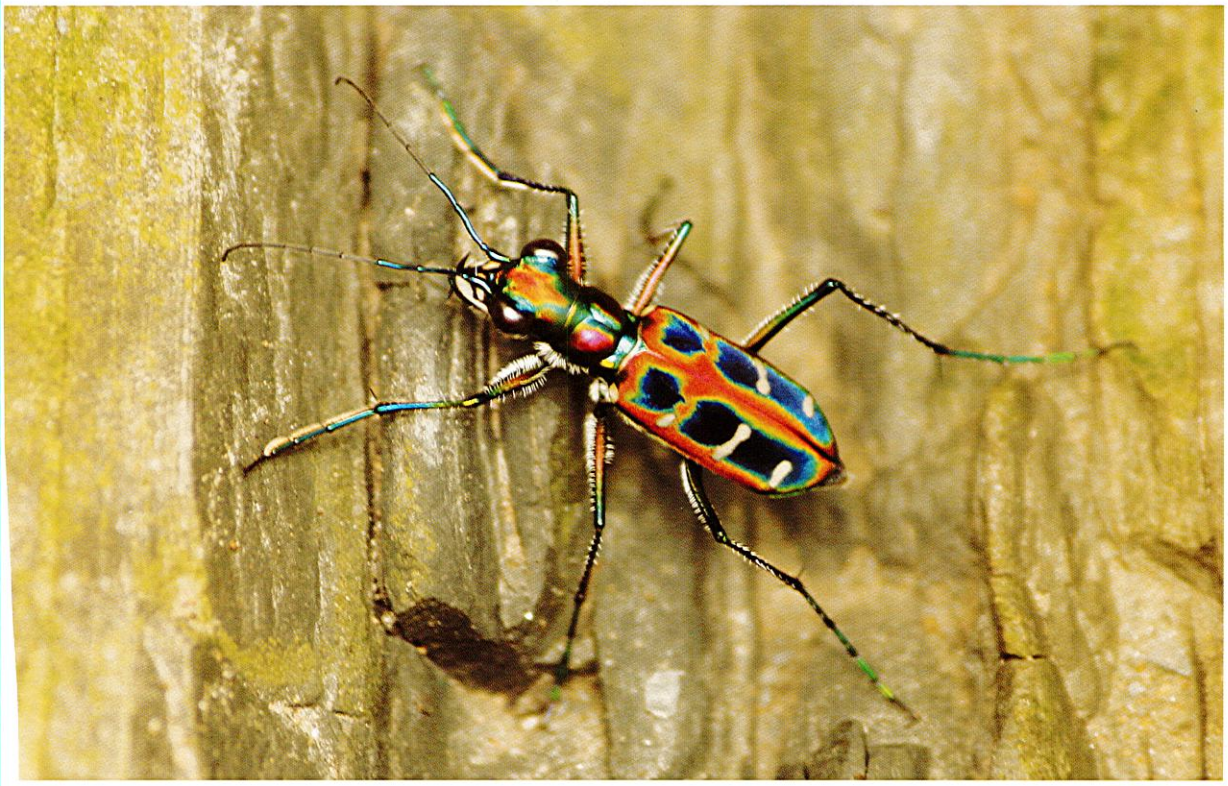
All stages of their life cycle are predaceous and feed on various insects like mosquitoes, blood-sucking flies and acting as an important biocontrol agent of many harmful insects and playing a crucial role in controlling pest population of agro-ecosystems. Apart from functioning as predators in the ecosystem, their value as indicators of habitat quality has also been widely appreciated in recent times.

Several species of Spiders were recorded during the study period. They are predaceous in nature and predate on butterflies, moths, dragonflies, damselflies, mosquitoes and other insects and play a vital role in forest ecosystems.

Few crab and shrimp species were found frequently in the streams running in and around the VCF. When fish resources are not available local indigenous people greatly depends on these shrimps and crabs to supplement their daily food items.

As is observed during the study period, role of invertebrate fauna is immense in maintaining the total ecosystem of Doluchari Village Common Forest.

Tiger Beetle

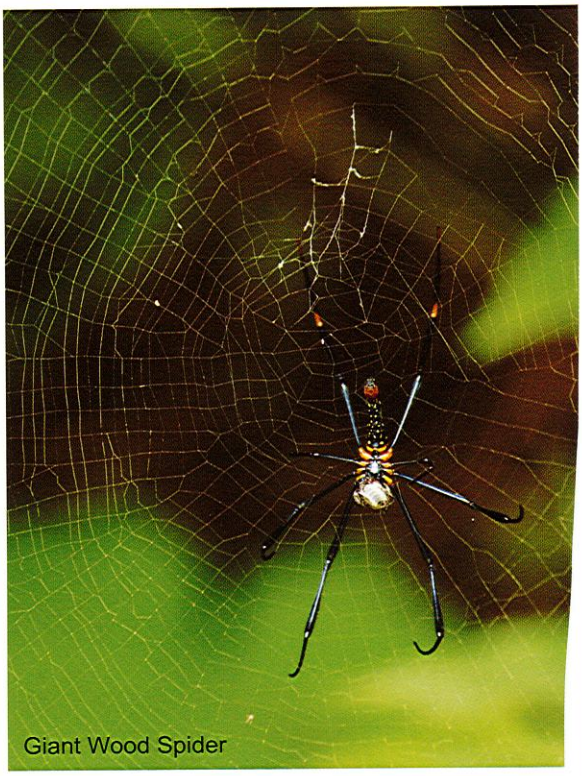


Unidentified Invertebrates


Unidentified Spider


Unidentified Spider


Unidentified Spider


Giant Wood Spider

Butterflies of Doluchari VCF

Status Code: C- Common, VC- Very Common, R- Rare
VR- Very Rare

English Name	Scientific Name	Status
Blue tiger	*Tirumala limniace*	C
Leopard lacewing	*Cethosia cyane*	C
Chocolate pansy	*Junonia iphita*	VC
Grey pansy	*Junonia atlites*	VC
Lemon pansy	*Junonia lemonias*	VC
Yellow pansy	*Junonia hierta*	VC
Pecock pansy	*Junonia almanac*	VC
Common castor	*Ariadne merione*	C
Angled castor	*Ariadne ariadne*	C
Common fourring	*Ypthima baldus*	C
Common fivering	*Ypthima huebneri*	C
Common Nawab	*Polyura athamas*	R
Common crow	*Euploea core*	VC
Common leopard	*Phalanta phalantha*	VC
Common palmfly	*Elymnias hypermnestra*	VC
Common baron	*Euthalia aconthea*	C
Common sailor	*Neptis hylas*	VC
Commander	*Moduza procris*	C
Clipper	*Parthenos Sylvia*	R
Grey count	*Tanaecia lepidea*	C
Knight	*Lebadea Martha*	C
Black Rajah	*Charaxes solon*	R
Tawny Rajah	*Charaxes psaphon*	C
Common Maplet	*Chersonesia risa*	R
Dark Archduke	*Lexias dirtea*	C
Redspot Duke	*Dophla evelina*	R
Black Prince	*Rohana parisatis*	R
Rustic	*Cupha erymanthis*	VC
Common Lascar	*Pantoporia hordonia*	C
Great eggfly	*Hypolimnas bolina*	VC
Dark-brand bushbrown	*Mycalesis mineus*	C
Plain tiger	*Danaus chrysippus*	VC
Striped tiger	*Danaus genutia*	VC
Tawny coster	*Acraea violae*	VC
Bamboo treebrown	*Lethe europa*	R
White-bar bushbrown	*Mycalesis anaxias*	R

a) Rustic b) Common Maplet
c) Black Rajah d) Red-spot Duke

Common Bluebottle

Butterflies of Doluchari VCF

Status Code: C- Common, VC- Very Common, R- Rare
VR- Very Rare

English Name	Scientific Name	Status
Common evening brown	*Melanitis leda*	VC
Blue mormon	*Papilio polymnestor*	VC
Common mormon	*Papilio polytes*	VC
Great mormon	*Papilio memnon*	R
Common rose	*Atrophaneura aristolochiae*	VC
Common jay	*Graphium doson*	VC
Lime butterfly	*Papilio demoleus*	VC
Yellow Helen	*Papilio chaon*	VC
Common Bluebottle	*Graphium sarpedon*	C
White Dragontail	*Lamproptera curius*	VR
Common mime	*Chilasa clytia*	VC
Common birdwing	*Troides Helena*	VR
Common emigrant	*Catopsilia Pomona*	VC
Mottled emigrant	*Catopsilia pyranthe*	VC
Chocolate albatross	*Appias lyncida*	C
Striped albatross	*Appias libythea*	C
Common grass yellow	*Eurema hecabe*	VC
Common gull	*Cepora nerissa*	R
Common jezebel	*Delias eucharis*	VC
Painted jezebel	*Delias hyparete*	VC
Red spot jezebel	*Delias descombesi*	VC
Common wanderer	*Pareronia valeria*	C
Psyche	*Leptosia nina*	VC
Great Orange Tip	*Hebomoia glaucippe*	C
Common pierrot	*Castalius rosimon*	VC
Angled pierrot	*Caleta caleta*	R
pointed ciliate blue	*Anthene lycaenina*	VC
Apefly	*Spalgis epius*	R
Common cerulean	*Jamides celeno*	VC
Metallic cerulean	*Jamides alecto*	C
Forget-Me-Not	*Catochrysops strabo*	C
Common line blue	*Prosotas nora*	VC
Tailless line blue	*Prosotas dubiosa*	C
Lime blue	*Chilades lajus*	VC
Lesser grass blue	*Zizina otis*	C
Pale grass blue	*Pseudozizeeriz maha*	C


a


b


c


d

a) Common Imperial b) White Bar-bushbrown

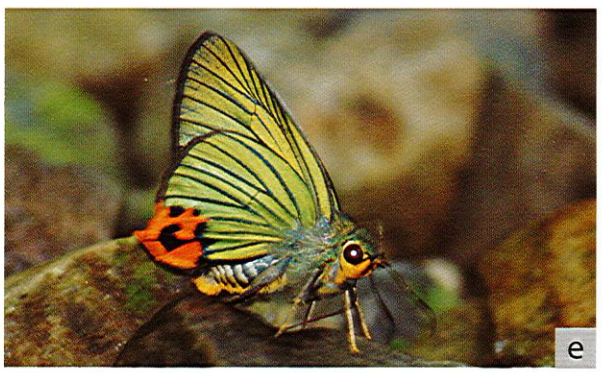
c) Tawny Rajah d) Knight


a


b


c


d


e


f


g

a) Tree Yellow

b) Dark Pierrot

c) Common Birdwing

d) White Dragontail

e) Indian Awlking

f) Common Yellow-breasted flat

g) Common Wight

Butterflies of Doluchari VCF

Status Code: C- Common, VC- Very Common, R- Rare
VR- Very Rare

English Name	Scientific Name	Status
Dark grass Blue	*Zizeeria karsandra*	C
Malayan	*Megisba Malaya*	R
Quaker	*Neopithecops zalmora*	VC
Common Tit	*Hypolycaena erylus*	C
Common Imperial	*Cheritra freja*	VR
Long-banded Silverline	*Spindasis lothita*	C
Common shot Silverline	*Spidasis ictis*	C
Chocolate Royal	*Remelana jangala*	C
Gram Blue	*Euchrysops cnejus*	C
Slate Flash	*Rapala manea*	C
Cenatur Oakblue	*Arhopala centaurus*	C
Large Oakblue	*Arhopala amantes*	C
Yamfly	*Loxura atymnus*	C
Punchinello	*Zemeros flegyas*	VC
Chestnut Bob	*Lambrix salsala*	VC
Indian palm Bob	*Suastus gremius*	R
Common Red Eye	*Matapa aria*	VC
Giant Redeye	*Gangara thyrsis*	R
Moore's Ace	*Halpe porus*	R
Tufted Ace	*Sebastonyma dolopia*	R
Common Wight	*Iton semamora*	C
Tree Flitter	*Hyarotis adrastus*	VC
Straight Swift	*Parnara guttatus*	VC
Chocolate Demon	*Ancistroides nigrita*	VC
Grass Demon	*Udaspes folus*	R
Common Banded Demon	*Notocrypta paralysos*	VR
Common Yellow-breasted Flat	*Gerosis bhagava*	C
Common Snow Flat	*Tagiades japetus*	VC
Chestnut Angle	*Odontoptilum angulata*	VR
Common Duffer	*Discophora sondaica*	R


a


b


c

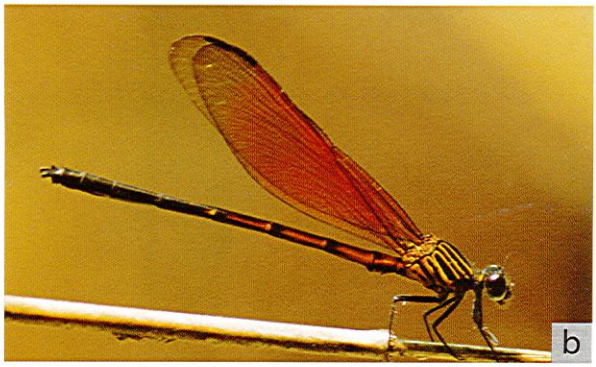

d

a) Trumpet Tail

b) Crimson-tailed Marsh Hawk

c) Black Marsh Glider

d) Common Clubtail



Dragonflies of Doluchari VCF

Status Code: C- Common, VC- Very Common, R- Rare
VR- Very Rare

English Name	Scientific Name	Status
Ditch Jewel	*Brachythemis contaminata*	VC
Scarlet Marsh Hawk	*Aethriamanta brevipennis*	C
Ruddy Marsh Skimmer	*Crocothemis servilia*	C
Ground Skimmer	*Diplacodes nebulosa*	C
Fulvous Forest Skimmer	*Neurothemis fulvia*	VC
Pied Paddy Skimmer	*Neurothemis tullia*	VC
Green Marsh Hawk	*Orthetrum sabina*	VC
Crimson Tailed Marsh Hawk	*Orthetrum pruinosum*	R
Common Picture Wing	*Rhyothemis variegata*	VC
Long-legged Marsh Glider	*Trithemis pallidinervis*	VR
Greater Crimson Glider	*Urothemis signata*	R
Common Clubtail	*Ictinogomphus rapax*	VR
Black Marsh Glider	*Trithemis festiva*	C
Trumpet Tail	*Acisoma panorpoides*	C
Yellow Tailed Ashy Skimmer	*Potamarcha congener*	R
--	*Epophthalmia* sp.	R

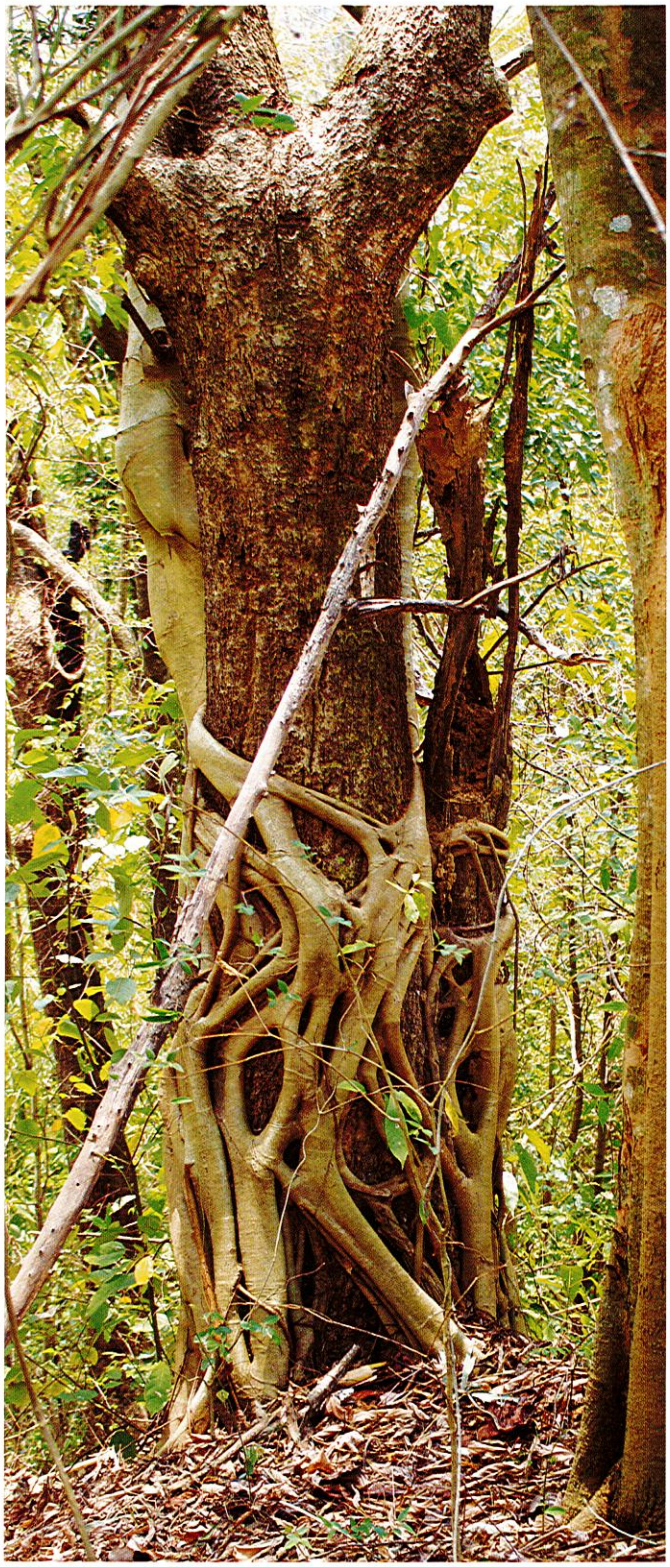
Damselflies of Doluchari VCF

Status Code: C- Common, VC- Very Common, R- Rare
VR- Very Rare

English Name	Scientific Name	Status
Coromandel Marsh Dart	*Ceriagrion coromandelianum*	VC
Orange-tailed Marsh Dart	*Ceriagrion cerinorubellum*	C
Saffron-faced Blue Dart	*Pseudagrion rubriceps*	R
Black Kneed featherleg	*Pseudocopera ciliata*	C
Stream Glory	*Neurobasis chinensis*	VC
Clear Winged Forest Glory	*Vestalis gracilis*	C
Black-tipped Forest Glory	*Vestalis apicalis*	R
Ochraceous Darkie	*Euphaea ochrace*	VR
Twin-spotted Sylvan	*Coeliccia didyma*	C
Black Emperor	*Rhinocypha quadrimaculata*	C
Black Marsh Dart	*Onychargia atrocyana*	VC
Blue Grass Dartlet	*Pseudagrion microcephalum*	C
Milky Dartlet	*Agriocnemis lacteola*	C
Yellow Bush Dart	*Copera marginipes*	R
Senegal Golden Dartlet	*Ischnura senegalensis*	C
River Heliodor	*Libellago lineata*	C

a) River Heliodor b) Ochraceous Darkie
c) Black Emperor d) Stream Glory

Unidentified Crab



4.6 Flora

Doluchari VCF is the part of Chittagong Hill Tracts and the forest is tropical mixed evergreen type. A total of 113 species of plants of different categories viz. tree, shrub, herb, climber, fern, epiphyte and parasite are recorded from this public managed forest. This is the first attempt to register the floral diversity of this VCF and we strongly believe that many species of trees are yet to be identified.

Trees are the most dominant floral component of this VCF. About 39 species of trees belonging to 27 genus and 22 families were recorded from here. Family Moraceae has been represented by the highest number of species (8). Different *Ficus* species are the major source of food for wild animals in this VCF and act as keystone species. Some common tree species are *Alstonia scholaris*, *Albizia chinensis, Ficus auriculata, Ficus racemosa, Ficus semicordata, Grewia nervosa, Holarrhena antidysenterica, Terminallia bellirica* etc.

A total of 19 species of shrubs belonging to 17 genus and 17 families were identified from this VCF. Shrubs are very important in terms of medicinal, foods and other important services. People from nearby villages are allowed to collect small scale of different shrubs species for medicinal purposes. Some important shrubs are *Clerodendrum viscosum*, *Lantana camara*, *Melastoma malabathricum*, *Schizostachyum dullooa*, *Solanum torvum*, and *Ziziphus oenoplia.*

Doluchari VCF is represented by 25 species of shrubs under 24 genus and 17 families. These plant communities support enormous insect population. *Imperata cylindrical*, *Centrella asiatica*, *Colocasia esculenta*, *Heliotropium indicum*, *Musa ornata, Saccharum spontaneum*, *Solanum americanum, Zingiber capitatum* etc are some common shrubs of this VCF.

Other than above stated plant communities, climbers (16 species), ferns (6 species), epiphytes (4 species) and parasites (4 species) constitute the overall plant communities of Doluchari VCF.

A mature Bohera Tree (mother tree) found at the middle of VCF

Trees in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Family	Local Name	Use
Albizia chinensis	Mimosaceae	Chakua Koroi	Fd, N, T
Albizia odoratissima	Mimosaceae	Tetoya Koroi	Fd, M, N, T
Albizia procera	Mimosaceae	Sada Koroi	F, M, T
Alstonia scholaris	Apocynaceae	Chatim	M, N
Aphanamixis polystachya	Meliaceae	Pitraj, Royna	M, T
Artocarpus chama	Moraceae	Chapalish	Fd, T
Bombax insigne	Bombacaceae	Bon shimul, Bon tula	N
Cassia fistula	Caesalpiniaceae	Sonalu	Fd, M, N, T
Dipterocarpus alatus	Dipterocarpaceae	Garjon (Sada)	M, T
Dipterocarpus costatus	Dipterocarpaceae	Baitta Garjon	F, N, T
Dipterocarpus turbinatus	Dipterocarpaceae	Tellia Garjon	T
Duabanga grandiflora	Sonneratiaceae	Bandarhola	T
Erythrina fusca	Fabaceae	Panya Mandar	N
Ficus auriculata	Moraceae	Baradumur	Fd
Ficus benghalensis	Moraceae	Bot	Fd, M, N
Ficus fistulosa	Moraceae		M
Ficus hispida	Moraceae	Dumur	Fd, M, N
Ficus lamponga	Moraceae	Jig bot, Katgularia	F
Ficus racemosa	Moraceae	Dumur, Jagyadumur	Fd, M
Ficus semicordata	Moraceae	Chokorgola	Fd, M, N

Teak Plantation

Aegle marmelos

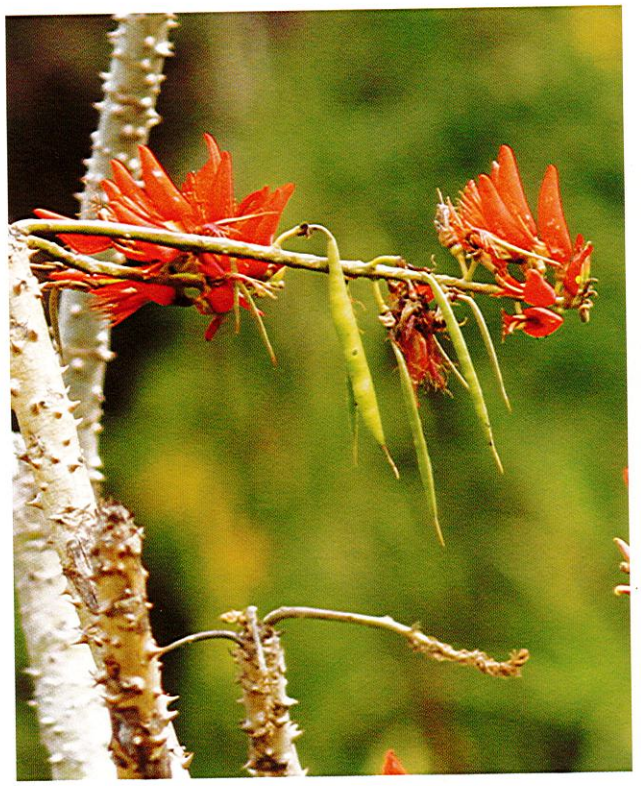
Unidentified Plant Species

Trees in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Ficus variegata	Moraceae	Bara dumur	F, Fd
Gmelina arborea	Verbenaceae	Gamar	M, T
Grewia nervosa	Tiliaceae	Assar	F, M
Holarrhena antidysenterica	Apocynaceae	Kurchi, Kuruj	M
Lithocarpus acuminata	Fagaceae	Kali Batna	T
Macaranga denticulata	Euphorbiaceae	Bura	M
Neolamarckia cadamba	Rubiaceae	Kadam	M, T
Phyllanthus emblica	Euphorbiacceae	Amloki	Fd, M, N
Protium serratum	Burseraceae	Gutgutia	Fd, T
Pterospermum acerifolium	Sterculiaceae	Muskanda	M
Pterospermum semisagittatum	Sterculiaceae	Lana-assar	M
Schima wallichii	Sapindaceae	Konak	M, T
Senna siamea	Caesalpiniaceae	Minjiri	Fd, N, T
Streblus asper	Moraceae	Sheora/Harba	Fd, M
Swintonia floribunda	Anacardiaceae	Civit	N, T
Syzygium balsameum	Myrtaceae	Buti Jam	F, Fd, N
Terminalia bellirica	Combretaceae	Bohera	Gd, M, T
Trewia nudiflora	Euphorbiaceae	Latim gach, Pitali	M
Zanthoxylum rhetsa	Rutaceae	Bajna, Bazinali	M, N, T

Neolamarckia cadamba



Erythrina fusca

Ficus semicordata

Shrubs in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Bambusa tulda	Poaceae	Mitinga, Mirtinga, Taralla	Fd, N
Clerodendrum viscosum	Verbenaceae	Bhant, Ghetuphul, Ghetu.	M
Crotalaria pallida	Fabaceae	Jan-jhani	M, N
Dalbergia spinosa	Fabaceae	Chulia-kanta, Anantakanta	
Dendrocalamus longispathus	Poaceae	Ora	Fd, N
Lantana camara	Verbenaceae	Lantana	M, N
Melastoma malabathricum	Melastomataceae	Bontezpata	M
Morinda angustifolia	Rubiaceae	Bonmali	N
Saprosma ternatum	Rubiaceae	Karful Gachh	
Schizostachyum dullooa	Poaceae	Dolu Bansh	N
Senna alata	Caesalpiniaceae	Dadmardon	M, N
Solanum torvum	Solanaceae	Tit begun, Gota begun	Fd, M
Tabernaemontana divaricata	Apocynaceae	Tagar, Dudh phul	N, M
Tarenna campaniflora	Rubiaceae	Kakra, Haru Lodi	M
Triumfetta rhomboidea	Tiliaceae	Banokra	M, N
Uraria crinita	Fabaceae	Dieng-kha-riu	M
Uvaria cordata	Annonaceae	Gagh-ranga	
Ziziphus oenoplia	Rhamnaceae	Bonboroi	Fd, M, N
Ziziphus rugosa	Euphorbiaceae	Jangli Boroi	Fd, M

Different Ficus species of Doluchari VCF act as keystone species for mammals and birds of that region. Role of these *Ficus* sp. are immense in terms of conservation of our native fauna.

Herbs in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Achyranthes aspera	Amaranthaceae	Apang, Upatlengra	M
Amaranthus viridis	Amaranthaceae	Ban-nate, Notay	M
Amorphophallus bulbifer	Araceae	Amla-bela, Jongle Ol.	Fd, M
Aponogeton echinatus	Aponogetonaceae	Ghechu	Fd
Celosia cristata	Amaranthaceae	Morogphul	M, N
Centella asiatica	Apiaceae	Thankuni	Fd, M
Chromolaena odorata	Asteraceae	Assamlata	M
Chrysopogon aciculatus	Poaceae	Lengra, Premkanta	Fd, M, N
Colocasia esculenta	Araceae	Kachu	Fd, M
Costus speciosus	Cymodoceaceae	Bonroi, Khustha, Kura	M
Curcuma zedoaria	Zingiberaceae	Shoti, Failla	M, N
Cymbopogon citratus	Poaceae	Dhan Sabarang, Lemon Ghas	Fd, N
Eclipta alba	Asteraceae	Kesaraj, Bhimraj	M
Eragrostis tenella	Poaceae	Koni Ghas	Fd
Heliotropium indicum	Boraginaceae	Hatisur	M
Imperata cylindrica	Poaceae	ChhanSungrass	Fd, M, N
Musa ornata	Musaceae	Kola	Fd
Peristylus constrictus	Orchidaceae	Bhuinora	M, N
Phyla nodiflora	Verbenaceae	Bhuiokra, Karoghar	M
Rauvolfia serpentina	Apocynaceae	Sarpagandha	M
Saccharum spontaneum	Poaceae	Kash, Kaichcha, Kagara	Fd, N
Solanum americanum	Solanaceae	Tit-begun	Fd, M
Sphenoclea zeylanica	Sphenocleaceae	Jhil Marich	
Zingiber capitatum	Zingiberaceae	Jongli Ada	Fd
Zingiber zerumbet	Zingiberaceae	Bon Ada	M

Heliotropium indicum

Climbers in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Adenia trilobata	Passifloraceae	Akandaphal	M
Calamus guruba	Arecaceae	Jali Bet, Kejuni Bet	N
Calamus viminalis	Arecaceae	Bara Bet, Khorkhoijja Bet	N
Coccinia grandis	Cucurbitaceae	Telakucha	Fd, M
Entada rheedii	Mimosaceae	Gilalata	M, N
Ipomoea maxima	Convolvulaceae	Ban Kalmi	
Merremia umbellata	Convolvulaceae	Sada Kalmi	M
Mikania cordata	Asteraceae	Assam lata	M
Paederia cruddasiana	Rubiaceae	Gandha-bhadali Pata	
Piper hamiltonii	Piperaceae	Jangali Pan	
Piper peepuloides	Piperaceae	Pipal	M
Smilax ocreata	Smilacaceae	Kumarilata	
Tragia involucrata	Euphorbiaceae	Chotra pata, Bichuti	M
Trichosanthes tricuspidata	Cucurbitaceae	Makal	M
Vigna adenantha	Fabaceae	Bon Barboti	
Cissus adnata	Vitaceae	Painna lata, Bhatia lata	

Trichosanthes tricuspidata

Ferns in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Adiatum incisum	Adiantaceae	Biddapata	*N
Angiopteris evecta	Angiopteridaceae	Dhekia Shak	Fd, N
Dicranopteris linearis	Gleicheniaceae	Lomba, Dhekia	M
Diplazium polypodioides	Athyriaceae	Dhekia	No
Lindsaea ensifolia	Lindsaeaceae	Bon Dhekia	
Pteris pseudopellucida	Pteridaceae	Dhekia.	

Epiphytes in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Scientific Name	**Family**	**Local Name**	**Use**
Aerides multiflora	Orchidaceae		N
Dendrobium fimbriatum	Orchidaceae		N
Pothos scandens	Araceae	Hatilata, Batilata	M
Robiquetia succisa	Orchidaceae		N

Parasites in Doluchari VCF

F = Fuel; Fd = Fodder or any kind food supply to the animals; M = Any kind of medicine; T = Timber and N= uses other than fuel, food, medicine, timber (mainly non-timber uses)

Scientific Name	Local Name	Family	Life forms
Cuscuta chittagongensis	Cuscutaceae	Pahari Swarnalata	
Cuscuta reflexa	Cuscutaceae	Swarnalata	M
Hoya parasitica	Asclepiadaceae	Pargacha	
Scurrula gracilifolia	Loranthaceae	Pargacha	

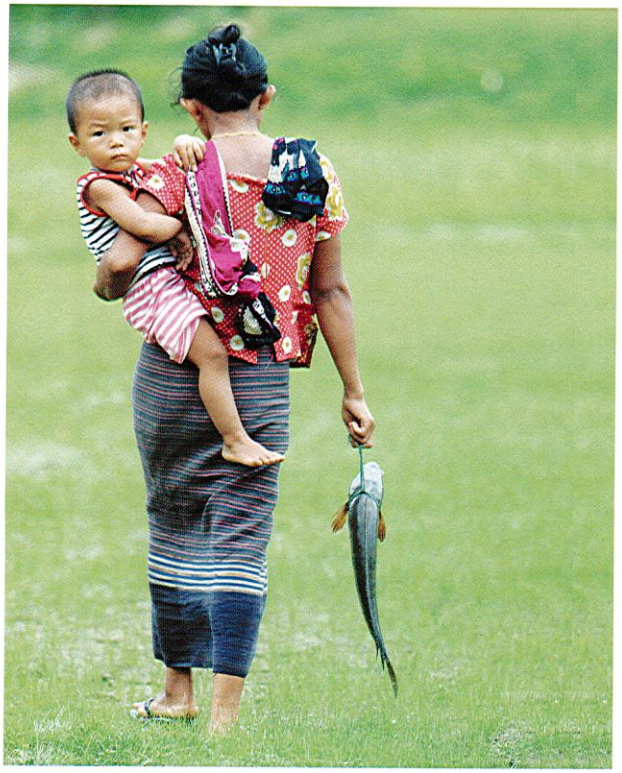
CHAPTER 5
CONSERVATION

5.1 Role of DVCF

Geographically Doluchari VCF is the extension of Rampahar hill of Kaptai National Park. So the biodiversity of this VCF is as rich as the Kaptai National Park. Doluchari VCF is characterized by hill ranges and two major charas (i.e. streams) which are covered by natural mixed evergreen forests, bamboos, climbers, epiphytes, herbs and shrubs as well as plantation of teak. Presence of enormous bamboos ('Dolu'- a locally named bamboo species) in this region reflects the name of this VCF. Bamboos are highly sought non timber forest products of this VCF. However communities living in and around the VCF are not allowed extracting bamboos indiscriminately without prior permission from Karbari or Mouza Headman. In case of emergency one can collect small amount of bamboos to meet the needs. Bamboo shoots are very popular food items among Chakma and Tanchangya community living in and around the VCF. The local inhabitants can collect bamboo shoots to meet their household needs from July to September but they are not allowed to sell the shoots in the market after collecting from VCF which is a punishable offense.

Two charas/streams alongside the VCF supply water in this region. Although the streams become almost dry during the winter but provide enough drinking water for animals and local inhabitants to nearby areas. Doluchari VCF harbors large number of insect population. Due to their enormous assemblage, many insectivorous birds, lizards and amphibians are seen throughout the year and a healthy ecosystem prevails in the VCF. There exists numerous small pits or pool of water inside the VCF year-round so that amphibians can safely meet their basic requirements for reproduction. Doluchari and Kukujjyachari chara running alongside the VCF yield large number of crabs and shrimps population. Such food items are the major source of protein during banning of fishing in Kaptai lake. Indigenous people living in and around the VCF collect medicinal plants for traditional treatment of fever, Jaundice and many other diseases. At a regular interval the local people can collect bamboo and other timber-yielding plants for making house, furnitures and boats after the permission of VCF management committee.

Uses of streams for different purposes. Washing of vegetables, bathing, collection of wild species of shrimps and crabs are some basic examples.

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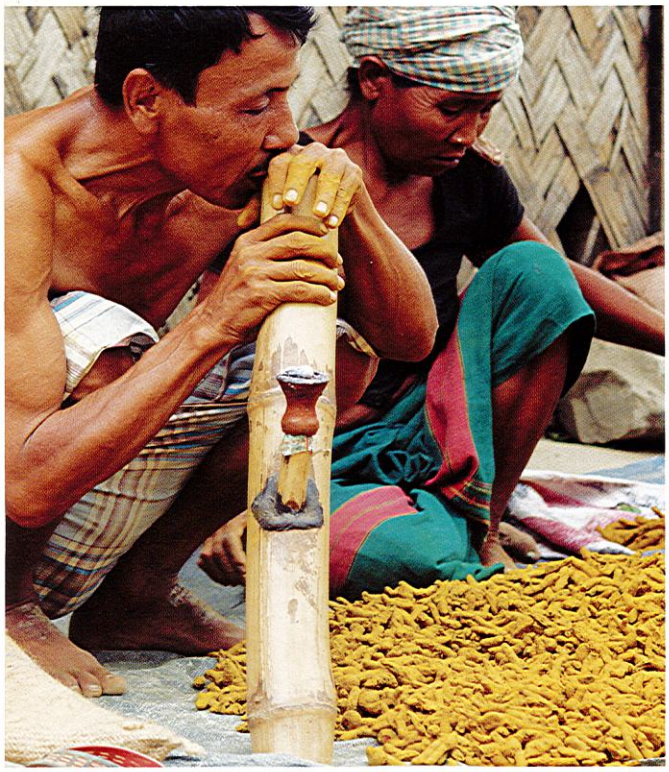
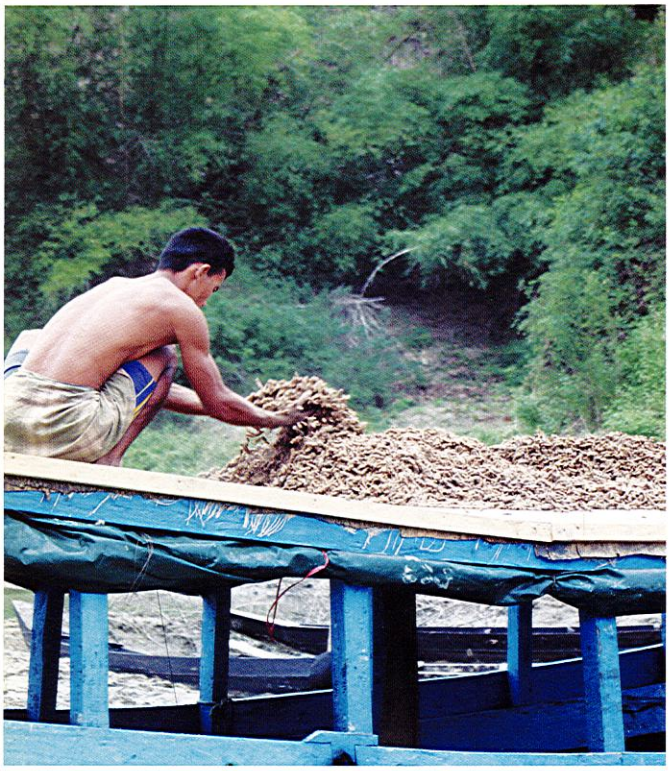
Mass extraction of medicinal plants, timber, banana, bamboo and bamboo shoots, shrimps and crabs are completely prohibited inside VCF boundary. While small scale of all basic commodities can be harvested from VCF having prior permission from village headman or Karbari.

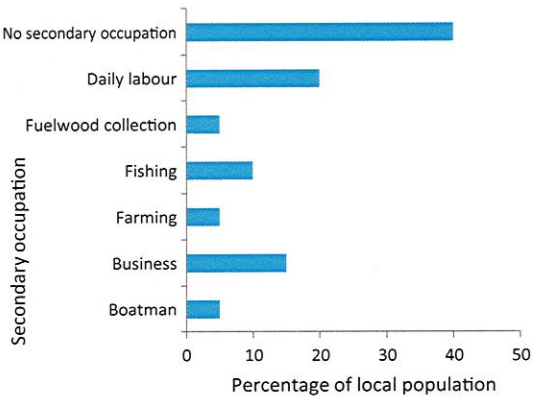




5.2 Socio-economic condition of local people

Questionnaire survey was conducted among the local inhabitants who are being benefited from the Doluchari VCF. Most of the respondents (45%) were 20-30 years old, followed by 31-40 years (30%), 41-50 years (15%), 51-60 years and above 60 years (5 %) each.

Most of the local people (55%) have primary education followed by 25% people of that community completed junior education (class VI to X). About 10% people of the local community have completed up to Secondary School Certificate (SSC) or Higher School Certificate (HSC) level. Only 10% people are illiterate. Almost all the villagers (90%) are either farmer or *Jhum* cultivator and very few of them have small business (5%). About 40% of the people have no secondary occupation while rest of the population is involved in occasional or seasonal alternative occupation. About 20% people are involved in daily wages and 15% are involved in small business while others are involved in fishing (10%), fuel wood collection, as a boatman, and farming (5% each) as their secondary occupation.



Secondary occupation of the villagers

Processing of turmeric (as shown in the images) are normally cultivated in hills around the VCF because all sort of cultivation is prohibited inside the VCF

About 50% of the families have 3 to 5 family members while 25% has 6 members and 20% has 7 members in a family. About 45% families have one or two children while 20% has three children and another 20% has more than four children.

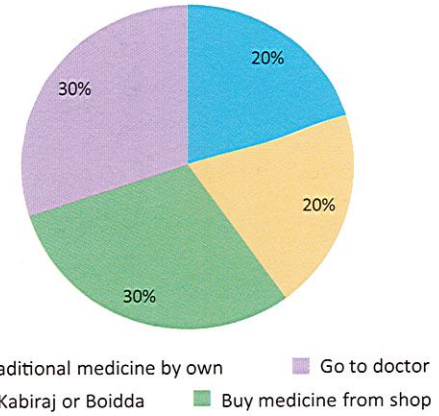
Most of the families in the local community are concerned about the education of their children and 90% parents do not encourage their children to be involed in parents' occupation. Among the children about 81.25% is school going. The primary chools are within 1km from their home.

The daily income of most of the people in this community (80%) varies from Tk. 200 to Tk. 300. Very few people (10%) earn more than Tk. 500 and rest 10% has Tk. 700 to Tk. 1000 income per day. About 90% people of this community practice *Jhum* cultivation but none of them has any *Jhum* land in VCF area. Most of the people (80%) of the local community mentioned that they cannot use same *Jhum* land for more than 2 to 3 years while 20% of them mentioned that they can use it for more than 5 years. The *Jhum* cultivators grow various kinds of crops including banana, turmeric, ginger, paddy, chilly and vegetables in their *Jhum* land.

All the families of the villages collect water for drinking and other household uses from the stream running through VCF. All the villagers (100%) are agreed that VCF is beneficial to them as they get water, food, traditional medicine, fuel wood, bamboo and potential timber for future use from the VCF. About 65% of the villagers mentioned that biodiversity of the area has been decreasing day by day but the VCF acts as a safeguard for the biodiversity of this region.

Paddy is only cultivated during dry season around the valleys of DVCF. Water from the DVCF used for irrigation in these paddy fields. These paddy production is the main source of rice throughout the year for the villagers

Besides other common diseases, Malaria is the major disease in this area and about 40% families suffered from Malaria. The nearest health care facilities are located at Rangamati, about 15km far from their village. When they get sick, about half of the people (20%) use traditional medicine by their own or 20% go to the *Kabiraj* (who treats with traditional medicine). About 30% of them buy conventional medicine from the nearest pharmaceutical stores and only 30% visit doctor.



Health care practice among the people living around the VCF

Almost all the people (90%) in the VCF area mentioned that nowadays they do not go for hunting. About 10% families of the community are involved in hunting and the regular hunted animals include different species of birds, wild boar, pangolin, porcupine and snakes. They hunt wild animals primarily for their meat but also use their skin, fur, fat, bile, horn, beak, teeth, scales and scutes for making traditional medicine. About 40% of the hunters get injured from wild animals during hunting. In most cases, they are attacked by wild boar or get snake bite.

Spending leisure time by the community members of DVCF

5.3 Conservation Issues

Though the villagers are managing the VCF for the betterment of their life, they are also facing different challenges to do that. Some of the threats to the VCF and its biodiversity are as follows.

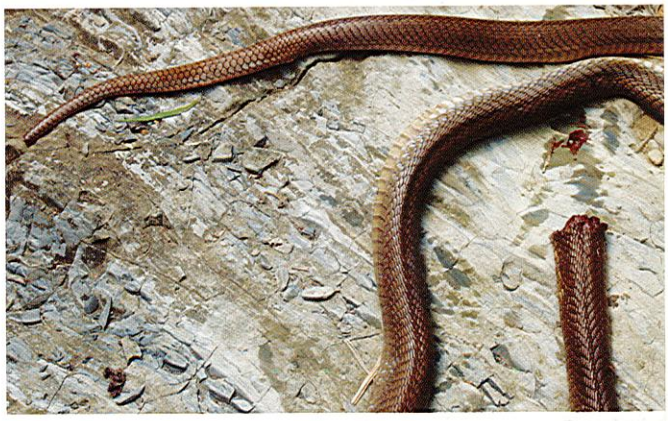
As the villagers mentioned that very few families are involved in hunting of wild animals and they do not hunt from the VCF area, but some of them illegally hunt animals from the VCF. Hunters from other areas also invade the VCF for hunting. Our research team also observed hunting of snakes inside the VCF area.

Indiscriminate collection of prawn and crabs in unsustainable way may cause imbalance to the biodiversity of the VCF area. Collection of crustaceans should be stopped during their breeding season and especially during winter when they become clustered.

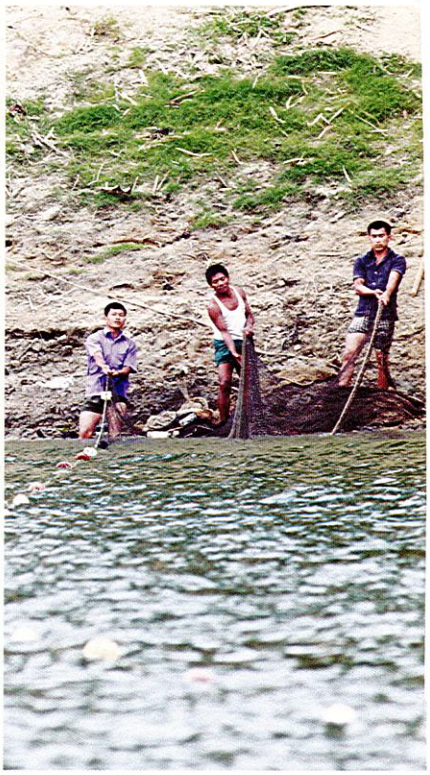
Some of the villagers collect large sized tadpoles from the puddles in the stream. Large scale collection of tadpoles may cause threat to the particular species of frogs such as Point-nosed Frog, Smith's Litter Frog, Berdmore's Microhylid Frog.

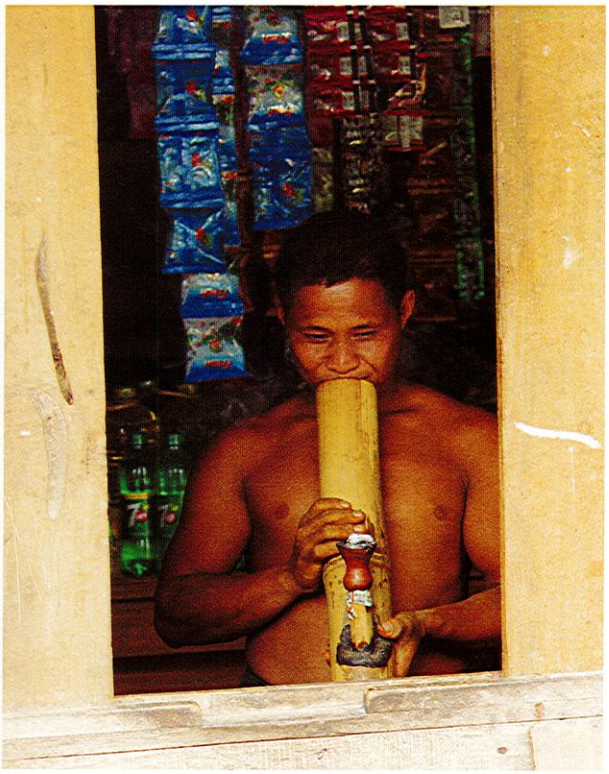
Small scale fuel wood collection from the VCF area is allowed but it becomes a problem when they illegally collect large scale fuel wood from the VCF. Some of the people from outside are involved in this process.

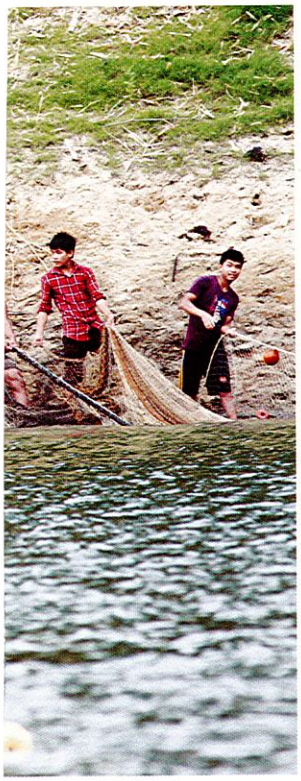
Local people use excessive pesticides in their agricultural fields and *Jhum* lands. Drainage of insecticides or pesticides into the streams and wetlands increase water pollutaion. Water pollution may be a threat to the breeding of amphibians and fishes in streams and also may cause interruption in food chain.

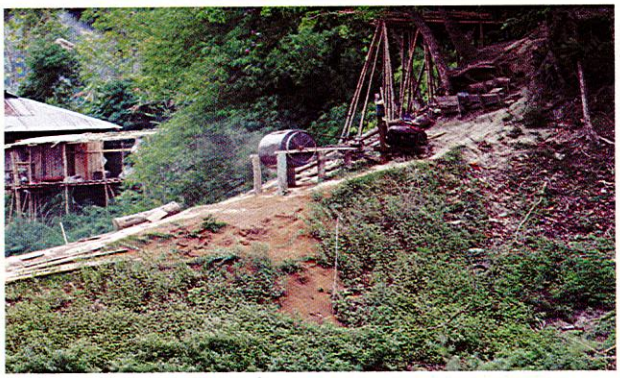


Hunting of wildlife is a punishable offense and totally restricted inside DVCF. However, hunting of rat snake and cobra for local consumption were recorded

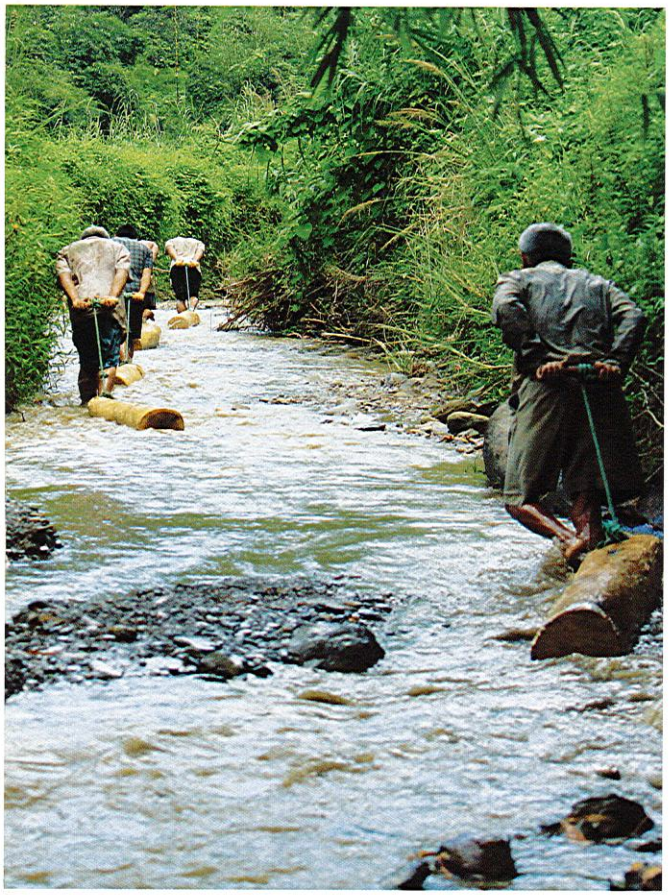








People of the different villages around DVCF generate their daily income through various alternate livelihood

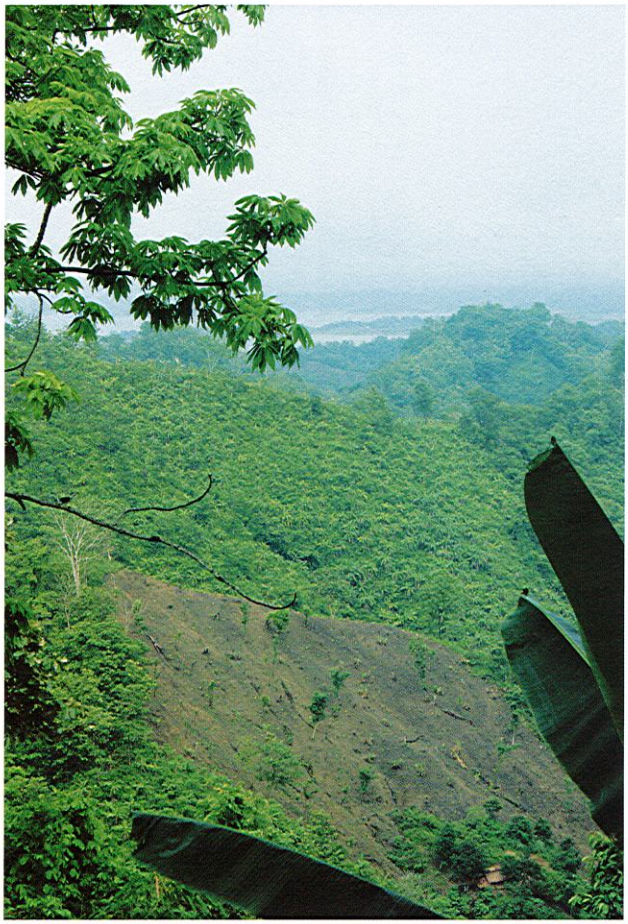


People residing around the VCF have made timber yielding plantation of Teak (*Tectona grandis*) and Gamari (*Gmelina arborea*) in nearby hills. It is quite impossible for them to extract those tree logs from remote areas during dry season. So during wet season tree logs are carried by the strong water flow of the streams to Kaptai lake to the downstream near their village.

Logging is not allowed within the DVCF area and local community does not collect timber from Doluchari VCF. It was observed that the streams through this VCF are used for transportation of logs are eventually collected from other hills outside this VCF in monsoon. During monsoon, streams become very important route for the transportation of logs. As they transport logs through the VCF, sometimes illegal logging may occur in the VCF during this process.

Slash and burn is completely prohibited inside DVCF and no record of habitat burning was observed inside. However, slash and burn for shifting cultivation in all hills around DVCF was recorded

Logs collected from other hills carried through the streams of DVCF



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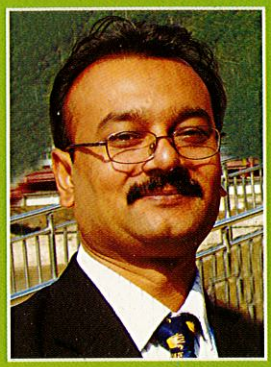
Scarlet Minivet (male)

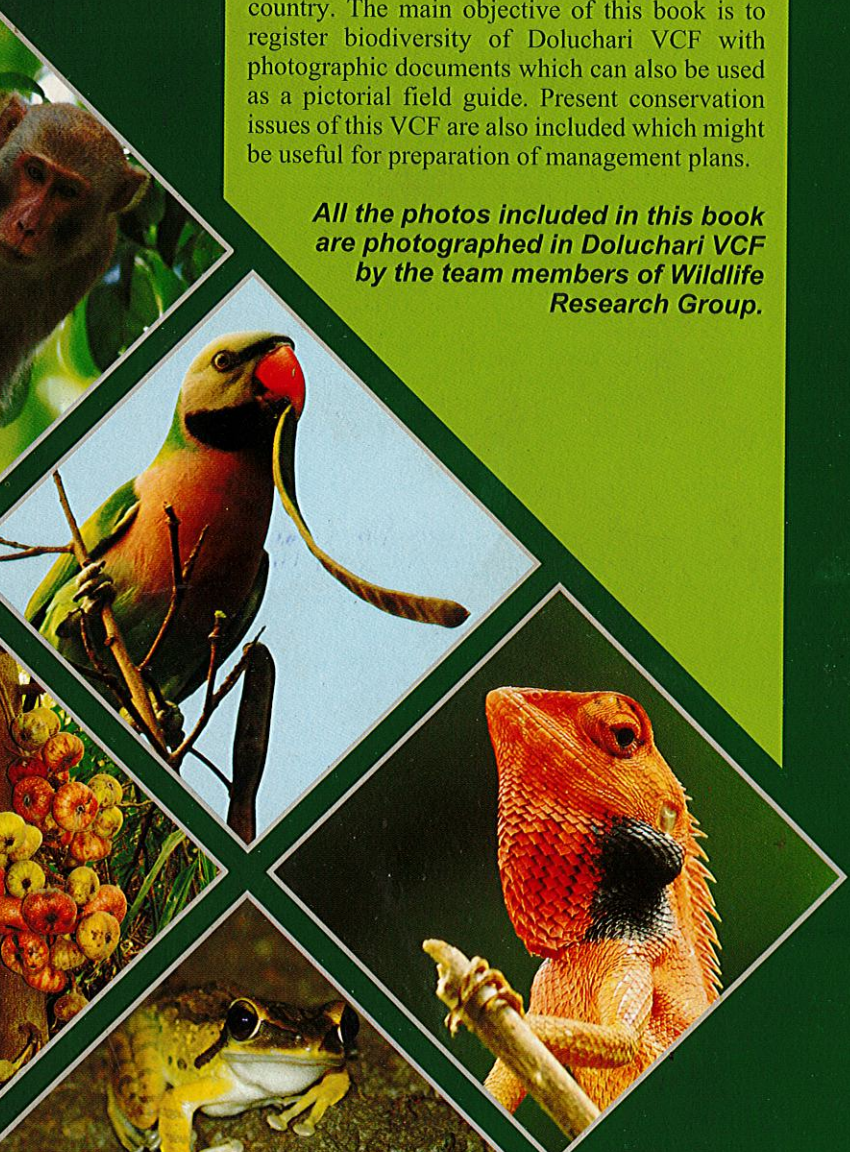
Rhesus Macaque

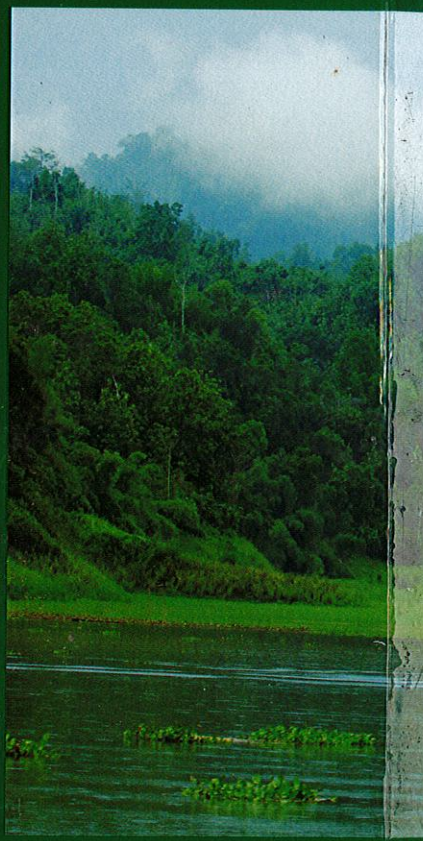


Dr. Mohammed Mostafa Feeroz is the senior most Professor of the Wildlife Research Group in the Department of Zoology, Jahangirnagar University. He completed his MSc in Wildlife Ecology from Jahangirnagar University in 1989. He was awarded the Commonwealth Scholarship for PhD Program in 1995 and obtained his degree in Wildlife Ecology, Management and Conservation from the University of Cambridge, UK in 1999. Recently he has expanded the wildlife research field in Bangladesh, added two new arenas: wildlife population genetics and transmissible diseases between wildlife and human by developing link programs with the University of Washington, Seattle, USA, St. Jude Children's Research Hospital, Memphis, USA and the Primate Research Institute, Kyoto University, Japan. Prof. Feeroz is awarded NIH (National Institute of Health, USA) Grant and also completed 39 research projects as the Coordinator/Principal Investigator funded by international organizations. He has published 103 research articles in national and international journals and is also the author/co-author of 15 books, and has participated in 35 international symposiums and congresses held in 12 countries. He is the member of "Wildlife Advisory Board", Ministry of Environment and Forest, Bangladesh, "National Expert Committee" for SRCWP, Tangua Haor and many others. He is also the member of 21 national/international organizations including IUCN Species Survival Commission (SSC). He is the "Lead Assessor" of Red List Assessing Group-Mammals, the Red List Updating- Bangladesh by IUCN. He has developed "Fun and Learn" non-formal environmental education training program for school children living in and around the protected areas of Bangladesh. He is the founder of the Wildlife Rescue Centre (WRC) in Jahangirnagar University, the first of its kind in Bangladesh. He received National Award "Bangabandhu Award for Wildlife Conservation 2014" for his outstanding contribution to education, research and conservation of wildlife of Bangladesh.

Doluchari Village Common Forest (DVCF) is less than 1 km² in size but support more than 67% of the amphibian species of the country because of its diverse habitat. This VCF became oasis for the wildlife of this region during dry season when all other surrounding hills are burnt for jhum cultivation. Thus this VCF plays a vital role for the biodiversity conservation of this region. Biodiversity of this VCF has been monitored by Wildlife Research Group (WRG), Department of Zoology, Jahangirnagar University which is supported by Arannayk Foundation. This book is the outcome of this research and can be used by conservationists, researchers, both amateur and professionals throughout the country. The main objective of this book is to register biodiversity of Doluchari VCF with photographic documents which can also be used as a pictorial field guide. Present conservation issues of this VCF are also included which might be useful for preparation of management plans.

All the photos included in this book are photographed in Doluchari VCF by the team members of Wildlife Research Group.





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