CHAPTER VIII

SUMMARY
Brahmaputra valley of Assam supports different ecozones but the amphibian fauna of the region still remain unexplored. The present study is designed with the following objectives:

a) Study of the taxonomic status of amphibians.

b) Study of food and feeding habits of amphibians.

c) To prepare an inventory on amphibian diversity in the valley and mid elevation forest.

The study was carried out in- Moist tropical evergreen forest; Semi evergreen forest; Moist deciduous forest; Dry deciduous forest; Savanna grassland; Littoral and swampy forest; Man modified / degraded habitat.

The study was carried out during 1995-2002 in three different seasons of the year namely premonsoon, monsoon and post monsoon.

Amphibians were identified following Boulenger (1882, 1920), Taylor (1965) and Chanda (1994). The sampling was done by laying quadrate and transect and the following indices were computed: - Diversity index (Shannon-Weiner); Evenness index (modified Hill ratio); Richness index (Margalef); Dominance index (Simpson).

A comparison of the food habits (identified up to order) of amphibians of grassland and woodland habitats in three different seasons was made. The food resources were utilized in computing niche width and niche overlap.

Presence of 30 species from the study sites, belonging to two orders – Anura (29 species) and Gymnophiona (one species) has been recorded. The
family Bufonidae represents by *Bufo melanostictus* and *B. stomaticus*. Two species of the family Megophryidae namely *Leptobrachium smithi* and *Xenophrys parva* were noted. *L. smithi* has vomerine teeth where as *X. parva* does not have vomerine teeth.

The family Microhylidae was represented by three species namely *Microhyla berdmorei*, *M. ornata* and *Uperodon globulosus*. *M. berdmorei* is comparatively larger, with long hindlimbs, and fully webbed toes. *M. ornata* has a small body and toes are with rudimentary webbing. *U. globulosus*, is a globular frog with a shovel shaped large inner metatarsal tubercles.

Nine species of Rhacophoridae were observed belonging to four genera namely *Philautus*, *Chirixalus*, *Polypedates* and *Rhacophorus*. The genus *Philautus* has four species viz. *P. andersoni*, *P. annandelii*, *P. Garo* and *P. jerdoni*.

One species of the genus *Chirixalus*, *C. vittatus* was observed, which is a small sized frog. The genus *Polypedates* was represented by *P. leucomystax* and *P. himalayensis*. The *P. himalayensis* has non ossified skin on the head where as *P. leucomystax* has well ossified skin on the head. *Rhacophorus bimaculatus* and *R. maximus* are the two species of the genus *Rhacophorus* that were recorded from the present study.

The family Ranidae was represented by twelve species under eight genera from the study sites. These are *Amolops gerbillus*, *Euphlyctis cyanophlyctis*, *Fejervarya limnocharis*, *F. syhadrensis*, *Hoplobatrachus crassus*,...
H. tigerinus Phrynoglossus borealis, Pterorana khare, Rana alticola, R. humeralis, R. leptoglossa and R. tytleri. F. limnocharis found to have four morphs which are differentiated from body size and varied middorsal line on the body.

The order Gymnophiona has single representative, Ichthyophis garoensis. I. garoensis is a large sized caecilian with yellow mid dorsolateral line extended from tail tip to jaws.

In Dibru-Saikhowa National Park 10 species of anurans were recorded; with a very low species richness (R= 1.599) and R. humeralis was the dominant species. Nameri National Park had 19 species with maximum species richness (R=3.8); the National Park is home for, rare species like Phrynoglossus borealis, Pterorana khare, Philautus andersoni, P. annadali, Uperodon globulosus and Chirixalus vittatus. 11 species were recorded Podumoni Bherjan Wildlife Sanctuary which also supporting rare species like P. jerdoni.

In Pobitora Wildlife Sanctuary eight species were found and the Sanctuary totally lacks any species of the family Rhacophoridae. Deepar Beel Bird Sanctuary, houses 11 species where more than half of the species belong to Ranidae. Chakrasila W.L.S. houses 11 species and in the Joypur Reserve Forest 14 species were recorded of which both Rhacophoridae and Ranidae constitute major share. 13 species each were recorded from Balipara Reserve Forest and Kholaghat Reserve Forest while Garbhanga Reserve Forest supports a species rich species fauna and 17 species of amphibians were observed. The Reserve
Forest housed endemic species like *Philautus garo* and *Ichthyophis garoensis*. Moyong Hills and Borduar Reserve Forest and Kulsi Reserve Forest also have high amphibian diversity of 16 and 17 species, of amphibians were recorded respectively. Dirheswari R.F., a disturbed habitat, also supported 09 species while in Govindapur Reserve 10 species of anuran and one species of *Ichthyophis* were noted.

The Brahmaputra Valley has a highly diversified amphibian fauna, which is admixture of Indian sub continental species, Chinese species, Myanmar and South East Asian species along with Oriental species. Semi evergreen Reserve Forest has the highest richness with 22 species (73%) followed by moist deciduous forest 20 species while Littoral and swampy forest area and degraded and man modified habitat support 11 species each.

The analysis of the gut content, revealed that *Bufo melanostictus*, *B. stomaticus*, *Hoplobatrachus crassus* and *H. tigrinus* had no preferences of food while species like *M. ornata*, *M. berdmorei*, *U. globulosus* were mainly dependent on hymenopteran insects and were niche specialist. Arboreal species like *Chirixalus vittatus*, *Polypedates leucomystax*, *P. himalayensis* and *Philautus garo*, fed mostly on Hymenoptera insects. In *Rana humeralis*, *Amolops gerbillus*, *R. leptoglossa*, *Euphlyctis cyanophlyctis* and *Fejervarya limnocharis* the Hymenopteran insect are the most preferred food while *Limnonectes lacticeps* and *R. alticola* as well as *R. tytleri* prefer coleoptran insects.
Anurans according to relationship were divided into three main groups namely primitive frogs, transitional frogs and advance frogs. In the Two species of primitive frog *Leptobrachium smithi* and *Xenophrys parva* were recorded from mid elevation moist deciduous forest. The advance frogs families observed were Bufonidae, Microhylidae, Ranidae and Rhacophoridae.

The specific amongst and overlap between species of Megophryidae and Bufonidae has been noted to be low. A high species overlap was observed between *Microhyla ornata* and *M. berdmorei*. The Ranidae, however, demonstrated various degree of niche overlap in different seasons. The diet analysis of Rhacophoridae presented a high degree of overlap, but partitioning of resources was observed in terms of habitat utilization. Various types of pests in the diet composition were recorded which suggests amphibian as natural pest destructor.

In the present study 18 genera of Amphibian were noted and based on distribution the amphibians could be classified into five groups namely,

a) Species of South Asia  
b) Species of Western India  
c) Species of Indian Sub-continent  
d) Species endemic to Eastern Himalaya  
e) Species of China, Myanmar and Far East.

The Brahmaputra valley has been proved to be a rich bio-diversity ecozone but endemism is less compared to Western Ghat.
The landscape and vegetations of Assam has been changed significantly. The main threats were identified as loss of forest cover due to unsustainable exploitation, change in land use pattern, flood and siltation and pollution of the habitat. However, threats and ultimate target group differs in different study area. The present study suggests,

a) Renewal of regional assessment of species based on IUCN threat categories to priorities amphibian species for conservation.

b) Inclusion of a few Reserve Forests representing different biotopes under protected area net work to ensure long term survival of threatened species, to exclude threats posing factors on the amphibians,

c) To impose restriction in of collection of forest product and

d) Restriction in the use of pesticides and fertilizer in the neighbouring agricultural fields.