HIGHLIGHTS OF THE SURVEY

The proximity of land area to sea and periodic inundation by seawater in the Western Ghats region may influence the origin of diversity among domesticated varieties of crops and species. Good number of traditional varieties are grown in the region but unfortunately artificial culture of prawn and intensive agriculture through introduction of HYV has reduced the area for traditional varieties. This has resulted in the extinction of few local varieties from the region. There is need for urgent action to preserve these local species and varieties.

Traditional special varieties of paddy, banana, mango and vegetables are having distinct quality, taste and aroma with high value of nutrition and disease resistance. Vegetables are one of the major groups of crop diversity. Mainly Brinjal, green leafy vegetables, chilly, tuber crops like Kesu (Colacasia), lady’s finger, are the major vegetable crops having high diversity and special significance. Diversity of fruit crops like jack, Carissa carandus and others should be preserved with care by providing incentives to farmers. Use of medicinal plants in the traditional food system should be encouraged. There is need for protection and development of threatened species in the interest of preservation of genetic material for research and crop improvement programme.

Landraces of many crops have provided the genes needed for pest and disease resistance or for the crops to adapt to poor soils, drought and cold temperatures. Unfortunately, we are losing these pristine heritage sites with the change of people’s perception on greedy unsustainable cultivation practices. Documentation of crop diversity involves assessment of local level ecosystem. The information base needs to be organized by addressing the Intellectual Property Rights and conservation plans along with understanding of human aspiration, priorities of conservation and elaboration of biodiversity management plan for sustainable management.

♦ **Intellectual Property Rights on Agro-biodiversity:** Traditional rice varieties have distinct characters like aroma, pest & disease resistance, drought resistance and salt-water tolerance. These varieties should be conserved and protected from biopiracy. Local varieties of vegetables, fruits like appemidi mango, banana, jack and others have
unique characters, which are species specific. There is need for acquiring IPR over these species.

♦ **Recognition and Incentives to local farmers involved in the conservation of traditional crop varieties:** Persons like Mr. Deva Rao of Mittabagilu village of Belthangadi taluk in Dakshina Kannada district deserve to be recognized, encouraged and honored by providing incentives, as they are totally involved in the preservation of traditional varieties of crops. This will help in creating awareness among younger generation and motivating them in the continuation of conservation programme.

♦ **Creation of separate marketing channels for traditional crops and their products:** There is need for providing separate marketing channel for traditional crops and products. Value addition at local level generates additional income and provides rural employment. This will help in ensuring food security locally.

♦ **Assessment of pest and disease resistance properties of traditional crop varieties:** Generally local crops have characters like distinct taste, nutritionally rich, resistance to pest & diseases, resistance to drought and salt tolerance, etc. These characters of the species should be preserved for further crop improvement programme as *in-situ gene bank*.

♦ **Extension of agro-forestry to meet the domestic needs:** Still there is lot of opportunity to increase the agro-forestry activity through planting of multipurpose trees to meet the daily requirement of fuel wood, fodder, small timber, bamboo, medicine, etc. This will help in reducing the pressure on natural forests. Multiple products derived from agro-forestry provide opportunity for value addition at local level where there is high potential for rural employment.

The unique diversity of livestock is both a gift of nature and legacy of every generation of farmers since agriculture began. Cattle, dogs and chicken are the three animal groups maintained under domestication by significant proportion of people since many generations. Buffalo, goat and pig have been introduced in the beginning of 20th century. Modern breeds of chicken are bred only for meat. The traditional chicken is selectively bred as fighting cocks, as the cockfights are a favorite pastime for some communities.

Landraces of many livestock animals like Malnad gidda have provided the genes needed for pest and disease resistance or to adapt to hilly region with least care. Diversity and density of Malnad gidda is very high in the region. Variability among the breed is very high with distinct characters namely Varshagandhi etc.
These are serving the needs of farmers by providing milk for improving the health and prosperity of people and manure for the enrichment of soil.

Initiative for introduction of indigenous milking cattle breeds suitable for the region by BAIF institute and Ramachandrapura matt were welcomed by the local farmers in the coastal district. Density of local Buffalo breed is high with less variability and improved breeds like Surthi and Murra breeds have become dominant breeds among the newly introduced breeds. No sheep in the region except one farmer migrated to Ankola taluk.

Country dogs with good characters were meant for farm protection. Majority of exotic/improved dog breeds are being kept as pet animals in and around the towns. Other domesticated animals like cat, rabbit and pigeon are reared as hobby.

Traditional breeds have provided the genes needed for pest and disease resistance or to adapt for hilly region having least care, drought and cold temperatures. Unfortunately we are losing this pristine genetic diversity with the introduction of exotics.

Documentation of livestock diversity involves assessment of ecosystem at local level hence; the information needs to be organized by addressing the Intellectual Property Rights and conservation plans. Understanding of the aspirations of people, need for development, conservation priorities and elaboration of biodiversity management plans for sustenance needs to be addressed.

♦ **Intensive and season oriented survey and documentation is needed to collect information on higher diversity in the region:** Working breed of domestic animals are expensive to maintain during the off-season. Hence, the farmer disposes them during summer season. Hence the seasonal data is required to be collected to draw the conservation and management plans.

♦ **Protection of traditional and native cattle breeds and preservation of unique characters:** Traditional breeds have provided the genes needed for pest and disease resistance or for adaptation to hilly region where there is adverse climatic condition. Indigenous breeds are also hardy, resistant to pest and diseases yield comparatively more milk than Malnad gidda like Sahiwal and others. They should be popularized, conserved and protected from biopiracy.
The unique characters of traditional/indigenous breeds need to be preserved and protected for further breeding programme in future.

- **Recognition and providing incentives to persons involved in the conservation of traditional livestock diversity**: Persons like Mrs. Janaki Honda, Kota village, Udupi and Dr. Raghuram Bhat of Ankola, Uttara Kannada district need to be recognized, honoured and encouraged by providing incentives to create awareness among the younger generation and motivate them to involve in protection and conservation of livestock diversity in the region.

- **Facilitating marketing channels for livestock products and encouragement of farmers to promote the conservation of traditional breeds**: Proper marketing channel is needed for dairy products and their byproducts to enhance the income of farmers through milk unions. Value addition at local level provides avenue for generation of rural employment and higher income leading to economic improvement. Improvement in the density of exotic animals is needed.

- **Assessment of traditional breeds for pest resistance, disease resistance and other good traits for further livestock improvement**: Milk from traditional breeds is thick and nutritionally rich as compared to other breeds. Resistance of certain local breeds to diseases, pests and drought should be identified and conserved for further improvement programme by creating in-situ gene bank.

Parameters considered for the survey were: Date, Time, Place, Taluk, District, Latitude, Longitude, Altitude, Weather, Habitat, Species, Individuals, Condition and Status of the bird species documented during the study.

Totally about 1611 individuals of 92 species birds were documented during the one hour study at each of the 23 locations. Many of the bird species especially raptors had locally declined in the districts. Bay owl is the first report from the Uttara Kannada district. White Bellied Sea Eagle, which has now become rare, was breeding at Mangalore taluk of Dakshina Kannada district. Some of the endemic birds sighted during the study were Little spider-hunter, Blue-winged parakeet, Malabar Trogon, Malabr Grey Hornbill, Great Black woodpecker and common Hill-Myna. Some of the rate birds like White-bellied Sea-Eagle, Great horned owl, Greater cormorant, Crested Serpent Eagle, Black-headed oriole, Quaker Tit-Babbler, Indian Scimitar-Babbler, Eurasian Spoonbill, Brahminy Shelduck, Western Marsh-Harrier, Pallid Harrier, Pacific Golden-Plover, Oriental Pratincole, Green Imperial-Pigeon, Pompadour Green-Pigeon also were newly reported for the unusual habitats. Vultures (King Vulture,
Eurasian Griffon, White Backed Vulture, Long Billed Vulture and Scavenger Vulture) that was reported to be existing twenty years back had drastically declined.

The different landscape types like the forests, river, mangroves, sea and others, topography and others, topography and other environmental factors have enriched the bird diversity in all the three coastal districts. During the survey, interesting findings about the bird species and their habitats, status were documented. Vultures (King Vulture, Eurasian Griffon, White Backed Vulture, Long Billed Vulture and Scavenger Vulture), that thrived well in these three districts decades ago, has become locally extinct. White-bellied Sea Eagle, quite rately sighted, was breeding at Mangalore of Dakshina Kannada district. Many of the rare and endemic birds were also sighted during the survey.

It was noticed that, the decline in Vulture populations were due to the non-availability of food (as they scavenge on the carcass of animals) Another reason being the destruction of their prime habitats like the tall trees, rocky areas, etc. On the contrary, the White-bellied Sea Eagles were found breeding due to the availability of proper roosting trees and food.

Many of the pristine forests, mangroves and river sides were being disturbed due to anthropogenic pressures in the name of developments and agriculture. Birds like Hornbills, Woodpeckers require tall trees for food and shelter, Wetland birds require good and less disturbed water body. Shore birds like seagulls prefer proper shore habitats and estuaries. Many a times these esauries and shore also face anthropogenic problems, thus leading to the disturbance in the population of shore birds.

About 68 species of birds were documented during the study of which few birds like White-bellied Sea-Eagle, Great horned owl, Great cormorant, etc were also sighted. There are still potential habitats that are pristine and preferred by the birds at these districts. Yet there are many developmental pressures on these three coastal districts that could erode the habitats and in turn depleting the unique bird population. The uniqueness and the rich avifauna must be conserved by protecting their habitats.

1. Protect the wetlands, mangroves, shores from any enroachments and developmental activities.
2. Tall and old trees to be protected even if they are outside the protected areas.
3. Provide feeding ground (Caracas to be left at restricted area) for the vultures, so that the population could be re-established.
Butterflies are depicted as symbols in art since the times immemorial. They are among the most fascinating and beautiful animals. Butterflies undoubtedly are the most attractive among all insects. Vivid colours, shapes, sizes and patterns have fascinated man from Bronze Age. Most butterflies are diurnal and hence, easy to observe. Butterflies are the subject for the study for both biologists and the layman. Butterflies are primary consumers and so are important in any ecosystem. The life cycle of butterflies are closely related to plants. Relationship between any species of plants and butterfly is very specific. Plants and butterflies have co-evolved together. Butterflies are sensitive to environmental changes and are indicators.

The order Lepidoptera is the second largest diverse group of insects. So far, 1,40,000 species have been described. Of them 17,200 species are butterflies (Rhaopalocera). Lepidopterans have scales all over the body. Butterflies fly during the day, moths during night. Butterflies at rest hold the wings vertically over the back. Moths, in contrast may either hold the wings tent like over the back or wrap them around the body or extend them to the sides. Virtually all butterflies have knob like clubs at the tip of the antennae. Moths lack antennal clubs. The caterpillar has three pairs of walking legs and five pairs of prolegs.

One hundred and three species of butterflies were recorded in coastal Karnataka during 12 months. These species belonged to 5 families and 67 genera. Nine species could not be identified. All butterflies except few were identified without killing them. The features, attributes and characteristics together formed the basis, for identifying the specimens. Maximum number of species belonged to Nymphalidae. Papilionidae and Pieridae. Both the caterpillars and adult require specific plant and habitat. If either the plant or habitat is remained, the butterfly is vulnerable to the changes. In coastal Karnataka, land development is occurring rapidly. This will have definite adverse effects on the butterfly fauna. But the authorities can do well to preserve habitats and plants of butterflies and other fauna in designated stretches of land. In this report, larval and adult host plants of butterflies species are not indicated as they have been listed by earlier workers. Further plants associated with butterflies recorded during the current survey in coastal region, is already reported.