ISSN 1014-2789

FEATURING FOREST NEWS

TIGER PAPER

Regional Quarterly Bulletin on Wildlife and National Parks Management

Vol. XXXI: No. 2 April-June 2004

REGIONAL OFFICE FOR ASIA AND THE PACIFIC (RAP)
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
BANGKOK

Contents

TIGERPAPER

FOREST NEWS

CROP RAIDING BY WILD BOAR (*Sus scrofa*) IN AND AROUND ARAVALLI, AND ITS MANAGEMENT IN RAJASTHAN, INDIA

by A.K. Chhangani and S.M. Mohnot

Introduction

In general, the survival and reproduction of wild animals depends on their ability to locate and harvest sufficient food to meet their nutritional needs. Timing and selection of food plants are synchronized to meet the animals' nutritional requirements. While all animals have the same general need to acquire energy, the specific patterns of resource utilization may, however, vary according to species, age-sex classes, group, population and habitat. All species interact with a variety of food sources distributed in their home ranges within their reach.

Crop raiding by animals, in particular mammals like elephants (*Elephas maximus*), gaur (*Bos gaurus*), blackbuck (*Antilope cervicapra*), chinkara (*Gazella bennetti*), wild boar (*Sus scrofa*), Hanuman langur (*Semnopithecus entellus*), and porcupine (*Hystrix indica*) has been widely reported from all over the country (Prater, 1971; Schultz, 1986; Sukumar, 1990; Bohra *et al.*, 1992; Balasubramanian *et al.*, 1993; Chhangani, 1994; Chhangani, 2000; Chhangani and Mohnot, 1997; Chhangani *et al.*, 2002).

Wild boars are found in good numbers in the Kumbhalgarh Wildlife Sanctuary in the Aravalli Hills, and are very adept at crop raiding due to their acute sense of smell and nocturnal feeding habit.

The wild boar has an elongated head with an abruptly truncated mobile snout that ends in a flat disk containing the nostrils. The head is very strong and used in fighting, digging and bulldozing vegetation. Wild boars are omnivorous, living on crops, roots, tubers and carrion (Prater, 1971). They feed in the early morning and late evening or at night. They are more destructive to crops than any other animals. Wild boars live in groups of 6-23 animals.

Group of wild boar (Photo: A.K. Chhangani)

In India, crop damage by wild boar is very common along the immediate peripheries of wildlife sanctuaries and national parks. But there are several areas in and around human habitations on the outskirts of villages, towns and cities where they also do considerable damage to crops, vegetable fields and orchards. This man-animal conflict is mainly due to the conversion of forests into large-scale monoculture plantations, shifting cultivation, overgrazing, forest cutting, and encroachment in the home ranges, which reduces the availability of natural food to wild animals.

This study aims to examine the role of cultivated food plants and their seasonality in the diet of wild boars, determine the extent and damage of crop raiding, list the total species of crops, vegetables, fruits and flowers affected by the wild boars, estimate economic losses and threats to the livelihood of farmers living in and around Kumbhalgarh Wildlife Sanctuary, and look at the various strategies employed by the people in the conservation and management of wild animals.

Kumbhalgarh Wildlife Sanctuary

Kumbhalgarh Wildlife Sanctuary (KWS) lies between 25°0' and 25°40' N and 73°21' and 73°30

E , some 200 km south of Jodhpur in the west Aravalli hills of Rajasthan. The sanctuary has a total area of 585 km^2 and ranges in altitude from 274 to 1,155 m about sea level. There are distinct winter, summer and monsoon seasons. During summer months, the temperatures fluctuate between 30° - 48°C during May and June. In winter, the temperature can drop as low as 2ºC in December-January. The average annual rainfall is 725 mm.

A variety of agricultural and horticultural crops are grown in the study area, including: *Cyamopsis tetragonaloba, Triticum aestivum, Zea mays, Lycopersicon lycopersicum, Brassica oleracea* L. var. c*apitata, Abelmoschus esculentus, Pisidium guajava, Punica granatum, Citrus medica, Musa paradisiaca, Carica papaya, Tagetes erecta* and *T. patula.*

The forest is broadly dry deciduous or woodland type dominated by *Anogeissus pendula, Anogeissus latifolia, Boswellia serrata, Lannea coromandelica, Wrightia tinctoria, Acacia Senegal, Acacia catechu, Ziziphus mauritiana, Butea monosperma,* etc.

The undergrowth mainly consists of *Ziziphus nummularia, Adhatoda zeylanica, Grewia tenax, Grewia flavescens, Capparis sepiaria, Lantana camara*, etc. Some climbers and grasses are also found.

The main fauna of KWS includes leopard (*Panthera pardus*), hyena (*Hyaena hyaena*), Indian wolf (*Canis lupus*), jackal (*Canis aureas*), sloth bear (*Melursus ursinus*), wild boar (*Sus scrofa*), fourhorned antelope (*Tetracerus quadricornis*), chinkara (*Gazella gazella*), porcupine (*Hystrix indica*), sambar (*Cervus unicolor*), bluebull (*Boselaphus tragocamelus*), toddy cat (*Paradoxorus hermaphrodiatus*), jungle cat (*Felis chaus*), fox (*Vulpes bengalensis*), crocodile (*Crocodilus palustris*) and rock python (*Python molurus*).

Material and methods

Data on the wild boar was collected during a long-term eco-behavioral study on Hanuman langurs (*Semnopithecus entellus*) from 1995 to 2001. During the study 25 farmers were interviewed and a questionnaire was prepared to gather information on the type of crops affected, crop raid behavior, seasonality of food preferences, crop protection strategies, economic loss and other issues concerning people's livelihoods and wildlife conservation issues. Scan sampling and *ad libitum* sampling methods (Altamann, 1974) were also used to collect additional information. For population estimates of wild boar, census data from the state forest department were used. In addition, visual counts had been made in the study area during the 7-year long study of langurs. Photography and videography also confirmed the presence of wild boar in the study area.

Results and discussion

Crop raiding: Wild boars were recorded feeding on about 39 species of cultivated plants in and around the Kumbhalgarh Wildlife Sanctuary study area, which included 13 crop species, 19 vegetables and 7 species of flowers and fruits. Crops such as *Zea mays, Saccharum officinarum, Arachis hypogaea* and some vegetable species suffered the most damage by wild boars. The animals were also observed eating roots, stems, both young and mature leaves, flowers, fruits and occasionally whole plants. The frequency of how much a plant species was eaten depended on how easily the boars could invade the fields. All the farms in the study were equally vulnerable to crop raids by wild boars. Generally, the farms located right at the sanctuary's boundary wall and those with poor crop protection strategies were at most risk and experienced frequent losses.

Population: Wild boar has a fairly good distribution in KWS and can be easily spotted during the early mornings and evenings. According to the censuses, the wild boar population in the sanctuary showed a steadily increasing trend from 1986 to 2000 (from 422 to 799 animals).

Crop protection strategies and management: Farmers use many methods to protect their fields and orchards from wild boars. These include patrolling the fields, watchdogs, fencing, guns, potash bombs, etc. The most commonly used crop protection strategy used by 71% of the farmers is constant vigilance. About 20% use dogs to chase the wild boars away, while the

remaining 9% resort to more dangerous methods like shotguns, potash bombs and high voltage electrical current, which usually kills or seriously injures the animals. Another method commonly used by farmers is to construct fences out of the thorny twigs and branches of *Prosopis juliflora, Acacia nilotica, Ziziphus nummularia, Z. mauritiana* and *Euphorbia caducifolia.* However, despite all these crop protection measures, wild boars still manage to invade the crop fields.

The annual economic loss to farmers from crop damage in the study area is about US$2,500-3,000 from all 25 farms. However, the cost of crop protection for each farm ranged between US$200-250 per year, for a total of US$5,000-6,250 annually. Therefore, the monitoring cost to a farmer comes to more than the cost of the crop damage.

For successful protection, it would require that people be in the fields throughout the day during the seasons when the crops are most vulnerable. Obviously this is not possible because the farmers have other work to do. In some instances, 4 or 5 farmers jointly hire a person or persons (depending on the farmer group) to guard their crop fields. This practice is the most economical and also more successful among the crop protection strategies.

Over the last 6 years people's attitudes towards conservation of areas and wildlife have changed considerably. Before, there were few applications for gun licenses, but now the number has greatly increased with people's desire to protect their agricultural and horticultural fields from wildlife attacks. In the majority of cases, the farmers depend on their crops for survival. This change in attitude is not restricted to the farmers living around KWS, but has also spread to other areas as well. This is a man-wildlife conflict issue that is related to a lessening of interest in conservation among the people of India, Africa and the United States (Sukumar, 1985; Infield, 1988; Balasubramanian *et al*., 1993; Canover and Decker, 1991; Chauhan and Sawarkar, 1989).

Acknowledgments

This study was part of the Indo-US Primate Project, a collaborative program between the Ministry of Environment and Forests, Government of India, and the U.S. Fish & Wildlife Service (Grant Agreement No.INT/FWS-22). The authors would like to thank Dr. Ashok Purohit and Dr. L.S. Rajpurohit, Department of Zoology, J.N.V. University, and the staff of the State Forest Department and officials of Kumbhalgarh Wildlife Sanctuary, especially A.C.F. Shri Lalit Singh Ranawat and Shri Sukhdave and Shri Madan Mali, for their support during this field survey. Thanks also to Mr. Bundu Khan for help during the computation work.

References

Altmann, J. 1974. **Observational study of behaviour: sampling methods**. *Behaviour* 49:227-267.

Balasubramanian, M., Baskaran, N., Swaminathan, S. and A.A. Desai. 1993. **Crop raiding by elephants in the Nilgiri Biosphere Reserve, India**. Paper presented at the international seminar on the conservation of the Asian elephant. Mudumalai.

Bohra, H.C., Goyal, S.P., Ghosh, P.K. and I. Prakash. 1992. **Studies on ethology and eco-physiology of the antelopes of the Indian desert.** *Annuals of Arid Zone*, 32(2):83-96.

Chauhan, N.P.S. and V.B. Sarwarkar. 1989. **Problems of over-abundant populations of Nilgai and Black Buck in Haryana and Madhya Pradesh.** *Indian Forester*, 115(7):488-493.

Chhangani, A.K. 1994. **Crop raiding behaviour and status survey of Nilgai (*Boselaphus tragocamelus*) around Jodhpur.** M.Sc. project report submitted to J.N.V. University, Jodhpur.

Chhangani, A.K. 2000. **Eco-behavioural Diversity of Langurs (*Presbytis entellus*) Living in Different Ecosystems**. Unpublished Ph.D. thesis. JNV University, Jodhpur.

Chhangani, A.K. and S.M. Mohnot. 1997. Kumbhalgarh **Wildlife Sanctuary under stress**. Nat. Symp. Public Participation & Env. Protection. Dec.1997. JNV University,

Jodhpur.

Chhangani, A.K., Purohit, A.K. and S.M. Mohnot. 2002. **Status survey and ecology of Nilgai (*Boselaphus tragocamelus*) around Jodhpur, Rajasthan**. *Cheetal* Vol.41:No.2 p.7-14.

Conover, M.R. and D.J. Decker. 1991. **Wildlife damage to crops: Perceptions of agricultural and wildlife professionals in 1957 and 1987**. *Wildlife Soc. Bull*. 19:46-52.

Infield, M. 1988. **Attitudes of a rural community towards conservation and a local conservation area in Natal, South Africa.** *Biol. Conserv*. 45:21-46.

Prater, S.H. 1971. **The Book of Indian Animals**. Bombay Nat. Hist. Soc., Bombay.

Schultz, B.O. 1986. **The management of crop damages by wild animals**. *Indian Forester* 112(10):891-899.

Sukumar, R. 1985. **Ecology of the Asian Elephant (*Elephas maximus*) and its interaction with man in South India.** Ph.D. thesis, India Institute of Science, Bangalore. pp.542.

Sukumar, R. 1990. **Ecology of the Asian Elephant in Southern India: II Feeding habits and crop raiding patterns**. *J. Tropical Ecology* 6:35-53.

Vansina, J. 1990. **Paths in the Rainforest. Toward a History of Political Tradition in Equatorial Africa**. Madison, University of Wisconsin Press.

Yoshiba, K. 1968. **Local and inter-troop variability in ecology and social behaviour of common Indian langurs.** In: Phyllis Jay (Ed.) *Primates*. New York, Holt, Rinehart & Winston. p.217-242.

Authors' address: c/o Primate Research Centre, 396, 3rd 'C' Road, Sardarpura, Jodhpur-342001,India; E-mail:chhanganiak@yahoo.com

Farmer with shotgun protecting crops from wild boar (Photo: A.K. Chhangani)

Table 1: Cultivated plants consumed by wild boar at Kumbhalgarh Wildlife Sanctuary

No.	Local Name	Botanical Name	Months when consumed
		Crops	

1	Ganwar	*Cyamopsis tetragonaloba*	July to December
2	Genhu	*Triticum aestivum*	November to March
3	Chana	*Cicer arietinum*	November to March
4	Moong	*Phaselus radiatus*	July to October
5	Rizka	*Medicago sativa*	April to July
6	Makka	*Zea Mays*	August to October
7	Moth	*Vigna aconitifolia*	August to October
8	Ganna	*Saccharum officinarum*	February to April
9	Mungphali	*Arachis hypogaea*	November to January
10	Sarson	*Brassica campestries*	December to January
11	Jawar	*Sorghum bicolor*	August to September
12	Til	*Brassica juncea*	September to October
13	Kapas	*Gossypium heerbaceum*	September to October
		Vegetables	
1.	Gajar	*Daucas carota*	December to March
2.	Dhania	*Coriandrum sativum*	October to February
3.	Chandalia	*Amaranthus hybridus*	August to December
4.	Kakri	*Cucumis sativys*	January to April
5.	Muli	*Raphanus sativus*	November to February
6.	Tamatar	*Lycopersicon lycopersicum*	September to March
7.	Band gobi	*Brassica oleracea L. var capitata*	December to February
8.	Bhindi	*Abelmoschus esculentus*	March to April
9.	Baingan	*Solanum melongena*	March to June
10.	Kachar	*Cucumis melo var. culta*	August to September
11.	Kanda	*Allium cepa*	November to January
12.	Palak	*Rumex vesicarium*	November to February
13.	Pudina	*Mentha spicata*	June to September
14.	Sakarkand	*Ipomoea batatas*	October to January
15.	Ful gobi	*Brassica oleracea L. var botrytis*	November to January
16.	Mirchi	*Capasicum annuum*	October to November
17.	Methi	*Trigonella foenum-graecum*	November to January
18.	Matira	*Citrullus lanatus*	August to September
19.	Tumbi/All	*Lagenaria siceraria*	July to September
		Cultivated flowers and fruits	
1.	Amrood	*Picidium grajava*	September to December
2.	Anar	*Punica granatum*	October to January
3.	Nimbu	*Citrus medica*	February to April
4.	Kaila	*Musa paradisiacal*	February to March
5.	Papita	*Carica papaya*	November to February
6.	Hajara	*Tagetes erecta*	November to February
7.	Hajara	*Tagetes patula*	November to February

STATUS OF WILD WATER BUFFALO (*Bubalus bubalis*) IN THAILAND

by Rattanawat Chaiyarat

Introduction

The wild water buffalo (*Bubalus bubalis*) is a critically endangered species. Some believe that the total world population is below 200 individuals, while researchers in Northeast India estimate that there are less than 4,000 individuals (Hedges, in press). Accordingly, the species is listed by the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES, 1979) as "Seriously Threatened," and by The World Conservation Union (IUCN) as "Endangered" (IUCN, 2000).

Huai Kha Khaeng Wildlife Sanctuary (HKK) in Uthai Thani Province, western Thailand, has recently been identified by IUCN as one of four key areas for the protection of wild water buffalo (Hedges, in press). The other areas are Bastar and Raipur districts of Madhya Pradesh (India), Manas Wildlife Sanctuary/Project Tiger Reserve (India), Kosi Tappu Wildlife Reserve (Nepal) and Royal Manas National Park (Bhutan). Elsewhere in South and Southeast Asia there are only feral buffalo (Hedges, in press).

Former distribution

In Thailand, wild water buffalo were reported to exist in relatively small herds totaling less than 40 individuals (Lekagul and McNeely, 1977). The population was "discovered" in 1964 when Royal Forest Department (RFD) officials were investigating reports of hunting in the remote HKK forest area and came upon the carcass of a wild water buffalo, providing evidence that wild water buffalo still existed in Thailand (Nakhasathien and Stewart-Cox, 1990). The officials viewed it as a significant find, and HKK was set-up to protect the endangered population.

A more recent survey in March 2000 called the size of the wild water buffalo population into question. Prayurasiddhi and Chaiwatana (2000), using a helicopter to fly over the survey area on two consecutive days, estimated the population of wild water buffalo in the sanctuary at 72. On the

In 1970, Seidensticker and McNeely (1975) surveyed the sanctuary on foot, walking first from Huai Ai Yoh forest guard station west of the HKK River, then following the river south to the sanctuary boundary. The study concluded that there were two separate populations of wild water buffalo in the sanctuary – one located in the riverine tall grass areas near the confluence of the Huai Ai Yoh, and a second group downstream, near what is today Krung Krai Guard Station.

The following year, a small herd of 6 wild water buffalo (5 adults and 1 calf) were sighted during a helicopter reconnaissance flight, 8 km south of Khao Bandai (Prayurasiddhi, 1977).

In 1985, Naksathit and Chanard undertook a new survey following the HKK River from Khao Ban Dai Forest Guard Station to Krung Krai Forest Guard Station, documenting both the size of water buffalo tracks encountered (assuming that different track sizes indicated different individuals), and estimating the size of the area used. The survey suggested that the population was between 35 to 40 individuals in the 70 km^2 area (Naksathit and Chanard, 1985).

Uicharoensak (1992) and another RFD researcher undertook a follow-up wild water buffalo survey of the same area, utilizing the same methodology. Observations were also made on species being grazed and on salt-lick use in the area. Uicharoensak (1992) found that wild water buffalo utilized all the forest types within a 1 km radius from the HKK river. No tracks were observed beyond this distance. The distribution of wild water buffalo was particularly high between Sob Huai Hin stream and Krung Krai Forest Guard Station. The study concluded the population to be between 36 and 39 individuals.

first day, 5 sightings were made and a total of 6 males, 21 females and 8 sub-adults were recorded. The largest herd contained 23 individuals. On the second day, 7 sightings were made, involving 10 males, 24 females, and three sub-adults. The distance between the sightings was not provided.

The social organization of wild water buffalo in Thailand has not been studied. According to Hedges (in press), Asian wild water buffalo generally exhibit the social structure characteristics of wild cattle, with the basic unit appearing to be the cow plus calf, and groups predominantly consisting of cows with calves and sub-adults, although some groups may also contain adult bulls on occasion. However, solitary bulls are the norm. Groups of sub-adult and adult males also occur, but these all-male groups tend to be rather ephemeral and do not show the same degree of cohesion as the groups of cows with offspring.

Large herd sizes of 75-100 animals have also occurred, but these were more common when the species was more numerous (Daniel and Grubh, 1966). It is likely that these large groups were only temporary assemblages of small herds (Prater, 1965). Our study attempted to estimate the population size and structure and identify the major factors limiting the population of wild water buffalo in Thailand. The results would be helpful in formulating conservation and management strategies to ensure the long-term survival of wild water buffalo in Thailand and other habitats.

Current distribution and population status

The current study was carried out in HKK during 1999 to 2001. The focus was on lowland areas near HKK River, where wild buffalo are known to be present. In the field, signs of wild water buffalo were also found all the way from Krung Kai Wildlife Guard Station to the Sob Huai Ai Yoh area. This area can be divided into two parts – the first part from Krung Kai Wildlife Guard Station to Khao Ban Dai Wildlife Guard Station, and the Transmission of disease to the wild water buffalo population in HKK is seen as a potential major threat. The wild water buffalo population is in contact with the domestic population, which substantially increases the potential for the transmission of disease, e.g. rinderpest and

second part from Khao Ban Dai Wildlife Guard Station to the Sob Huai Ai Yoh area. The signs of wild water buffalo were concentrated in the first part. This might be because the terrain through the second part is considerably steeper than the area in the first part. It could also be that lower river volumes between Sob Huai Ai Yoh and Khao Ban Dai Wildlife Guard Station (an area not affected by the Sri Nakarin Dam) permit the movement of wild water buffalo north along the stream and riverbank in the dry season. Evidence was also found that the animals traveling north of Khao Ban Dai Wildlife Guard Station tended to be solitary bulls (i.e. larger tracks measuring 20x20 cm^2), as opposed to herds with cows and calves.

The average herd size was estimated to be 5.67 individuals (SD=4.75, N=21 times), with herd sizes ranging from 2 to 19 individuals. The dung count survey shows a current population of 38 (Chaiyarat, 2001). Track-based assessments carried out in the mid-1980s and early 1990s also recorded populations of between 35-40 (cf. Naksathit and Chanard, 1985; Uicharoensak, 1992).

During the study, the carcass of an adult female wild water buffalo was found and judged to have been killed by a tiger (pers. obs. February 29, 2000). Tigers are the primary predators of wild water buffalo in HKK; however, the finding of an adult wild water buffalo killed by a tiger does not fit well with the suggestion of Lekagul and McNeely (1977) and de Silva *et al.* (2001) that predators of wild water buffalo prey primarily on calves, juveniles or unhealthy buffalos. Another paper exists that supports the view that adult wild water buffalo are also subject to predation by tiger. Bhumpakphan (1997) reported finding two adult wild water buffalo that had been killed by tiger attacks in HKK. Attacks on calves and juvenile wild water buffalos by tiger are also likely to be common. Petdee (2000) found buffalo hair in tiger scat in the wet season, a period that coincides with the birthing season of wild water buffalo.

food-and-mouth disease. Most domestic water buffalos were either removed from the sanctuary or shot in the early 1990s. There are, however, several villages in the sanctuary's buffer zone, and domestic water buffalo are numerous in these villages. Wild water buffalo have courted

domestic buffalos at the edge of the sanctuary. Each such encounter substantially increases the threat of transferring disease to the wild population.

No evidence of poaching of wild water buffalo was observed in HKK during the study period. Fortunately, wild water buffalos are not generally affected by trophy hunting. Most people are unable to tell the difference between the horns of wild and domestic water buffalo and the low market prices reflect this confusion.

Conservation and management

There are two important reasons for considering the option of translocating wild water buffalos. The first is the threat of disease wiping out the single population. The second reason is the fact that the wild water buffalo population in HKK has not grown in the last 15 years.

Transmission of disease to the single wild water buffalo population is a major concern. During the research period, foot-and-mouth disease reached pandemic proportions globally. There are domestic buffalo in the immediate vicinity of HKK. It would be very easy to pass diseases from domestic to wild population or vice versa.

The reason for the population's failure to thrive is not known. Available evidence suggests that the herd is healthy. Females in the herd are capable of reproducing (Kraison Wiriya, pers. comm., 1998; Prayurasiddhi and Chaiwatana, 2000). And the forage inside the sanctuary is known to be of good nutritional quality and plentiful (Chaiyarat, 2002). There is no evidence of environmental degradation due to overuse. One suggestion for the stagnant population growth is that there is unusually high predation in the sanctuary. Another is that a large portion of new-born calves may be lost by drowning in the HKK River during the yearly floods in October.

Translocation initiatives are controversial for two reasons. The first is the small size of the population, which is less than 50 individuals. Removing 4 or 5 individuals reduces the genetic variety in the remaining wild population. The IUCN Action Plan recommended against translocation in Nepal on the basis of a small population (Hedges, in press). The second reason is that the translocation of wild water buffalo inevitably brings up the issue of resettling villages from wildlife sanctuaries, which is a highly sensitive topic.

Acknowledgments

Our great appreciation and thanks are given to Theerapong Choomsangsri, Sompong Jantawayot and forestry students of Kasetsart University for their technical support and friendship. We gratefully acknowledge Wirot Kempanya and Wanchanok Suvannakhorn for facilitating this research. Thanks are also offered to Dr. Schwan Tunhikorn for his permission and encouragement to study the wild water buffalo in Huai Kha Khaeng Wildlife Sanctuary, and to WWF-Thailand for funding this research.

References

Bhumpakphan, N. 1997. **Ecology characteristics and habitat utilization of gaur (*Bos gaurus* H. Smith, 1827) in different climate sites.** Dissertation, Kasetsart University, Bangkok.

Chaiyarat, R. 2001. **Ecology and habitat utilization of wild water buffalo (*Bubalus bubalis*) in Huai Kha Khaeng Wildlife Sanctuary, Thailand.** Dissertation, Kasetsart University, Bangkok.

Chaiyarat, R. 2002. **Forage species of wild water buffalo (*Bubalus bubalis*) in Huai Kha Khaeng Wildlife Sanctuary, Thailand.** *Buffalo Journal* 3:289-302.

CITES. 1979. **Convention on international trade in endangered species of wild fauna and flora.** Regulations and appendices published by the Federal Wildlife Permit Office, United States Fish and Wildlife Service, Washington, D.C., USA.

Daniel, J.C. and B.R. Grubh, 1966. **The Indian wild water buffalo, *Bubalus bubalis* (Linn.), in peninsular India: a preliminary survey.** *Journal of Bombay Natural History Society*

63:32-53.

DeSilva, M., Dissanayake, S. and C. Santiapillai. 2001. **Aspects of the population dynamics of wild water buffalo (*Bubalus bubalis*) in Ruhuna National Park, Sri Lanka.** Http://www.wht.org/publications/serials/abstracts/Contents1-1/Abstracts/buffalo.html.

Hedges, S. in press. **Asian wild cattle and buffaloes. Status Report and Conservation Action Plan**. IUCN/SSC Asian Wild Cattle Specialist Group, Gland, Switzerland.

Lekagul, B. and J.A. McNeely. 1977. **Mammals of Thailand.** Association of the Conservation of Wildlife, Bangkok, Thailand.

Nakhasathien, S. and B. Steward-Cox. 1990. **Nomination of the Thung Yai-Huai Kha Khaeng Wildlife Sanctuary to be a UNESCO World Heritage Site.** Wildlife Conservation Division, Royal Thai Forest Department, Bangkok, Thailand.

Naksathit, N. and T. Chanard. 1985. **Progress Report in the ecology of wild water buffalo in Huai Kha Khaeng Wildlife Sanctuary, Uthai Thani Province and the surrounding area.** Royal Thai Forest Department, Bangkok, Thailand (in Thai).

Prater, S.H. 1965. **The Book of Indian Animals.** Bombay Natural History Society, Bombay.

Petdee, A. 2000. **Feeding habits of the tiger (*Panthera tigris* Linnaeus) in Huai Kha Khaeng Wildlife Sanctuary by fecal analysis.** M.S. thesis, Kasetsart University, Thailand (in Thai).

Prayurasiddhi, T. 1977. **Progress Report on wild water buffalo (*Bubalus bubalis* Linnaeus, 1758) in Huai Kha Khaeng Wildlife Sanctuary, Uthai Thani Province, Thailand.** *Journal of Wildlife in Thailand* 8:13-23 (in Thai).

Prayurasiddhi, T. and S. Chaiwatana. 2000. **Aerial survey on population of wild water buffalo in the Huai Kha Khaeng Wildlife Sanctuary, Thailand.** *Journal of Wildlife in Thailand* 8(1):150-153 (in Thai).

Seidensticker, J. and J. McNeely. 1975. **Observations on the use of natural licks by ungulates in the Huai Kha Khaeng Wildlife Sanctuary, Thailand.** *Natural History Bulletin of the Siam Society* 26:25-34.

Uicharoensak, V. 1992. **Ecology and current distribution of wild water buffalo (*Bubalus bubalis* Linnaeus, 1758) in Huai Kha Khaeng Wildlife Sanctuary, Uthai Thani Province.** Kasetsart University, Bangkok, Thailand (in Thai).

Author's address: c/o Department of biology, Faculty of Science, Mahidol University, Bangkok-10400,Thailand.

NATURAL RESOURCES MANAGEMENT IN BANGLADESH: LINKING NATIONAL PRIORITY TO GLOBAL PERSPECTIVE

A.H.M. Ali Reza

Introduction

The earth's biological foundation is eroding at a rate unequaled in at least 65 million years (Johnson 1995). Rapidly escalating human demands for natural resources are causing genes, species, and natural ecosystems to disappear at an unprecedented rate. Therefore, conservation is becoming a crisis discipline. Deciding what to conserve and where is an essential first step in managing the crisis.

Although estimates vary widely, there may now be 30 million or more species on the earth. Living organisms are found everywhere on the surface of the planet, including such inhospitable places as the polar icecaps and deep within sulfur springs thousands of meters below the surface of the Pacific Ocean. The interaction of species with each other and their environments has multiplied with the growing diversity of life, giving rise to new evolutionary pathways that eventually contribute to the formation of new species and ecosystems. One of these pathways produced the species *Homo sapiens* roughly one million years ago.

Extinction is, however, a fact of life. Sooner or later, every species meets its fate; it may be overwhelmed by environmental changes or by the debut of a new species. The fossil record indicates that during the more than 3.5 billion year history of life, the average longevity of a species has ranged from less than a million years for some groups of mammals, to about 10 million years for certain groups of invertebrates and flowering plants (Wilson, 1992). The fossil record indicates that life has been impoverished by five massive extinction events during the past 450 million years, each of them wiping out between 25 and 50 percent of all biological families (Raup, 1988).

Diversity in genes, species, and ecosystems has contributed immensely to the productivity of agriculture, forestry, fisheries, and industry. Globally, species have been disappearing at 50-100 times the natural rate, and this is predicted to rise dramatically. Based on current trends, an estimated 34,000 plant and 5,200 animal species – including one in eight of the world's bird species – face extinction. In modern society, biodiversity contributes enormously to human welfare as well. For example, a substantially high figure of prescription drugs worldwide owe their existence to compounds first derived from plants, e.g. Neem (*Azadurachata indica*) is prescribed for malaria, skin disease, inflammation while Thankuni (*Centella asiatica*) is used as stimulant. The over-the-counter value of plant-derived pharmaceuticals alone exceeds US $ 40 billion per year worldwide (Miller and Tangley, 1991).

While the loss of individual species draws our attention, it is the fragmentation, degradation, and outright loss of forests, wetlands, coral reefs, and other ecosystems that poses the gravest threat to biodiversity. Forests are home for much of our known terrestrial biodiversity, but about 45 percent of the Earth's original forests are gone, cleared mostly during the past century. Up to 10 percent of coral reefs, among the richest ecosystems, have been destroyed, and one third of the remainder face collapse over the next 10 to 20 years. Coastal mangroves, a vital nursery habitat for countless aquatic species, are also vulnerable, with half already gone. The awareness of the need for conservation has been on the rise since the 1950's in the developed world. Rachel Carson, in her 1962 seminal work, **Silent Spring**, had signaled the widespread effect of pollution on the environment. In 1972, another significant book, **The Limits to Growth** articulated the

fear of exhausting the earth's non-renewable resources. These were some important milestones in raising worldwide consciousness of the adverse environmental impacts of the development activities. The idea that the environment and development are two sides of the same coin had become apparent in the 1970s. In 1972, the first major world conference on Human Environment was held in Stockholm, where Heads of States from all over the world came together for the first time to consider the state of the earth. The United Nations Environment Programme (UNEP) was established to deal with the environmental issues. The World Conservation Strategy was conceived by the The World Conservation Union (IUCN), UNEP and the Worldwide Fund for Nature (WWF) in 1980, as a means of providing a comprehensive, sector-wise analysis of conservation and resource management issues, to integrate environmental concerns into the development process: *"¼because unless patterns of development that also conserve living resources are widely adopted, it will become impossible to meet the needs of today without foreclosing the achievement of tomorrow" (IUCN/UNEP/WWF, 1980)* The World Com- mission on Environment and Development (WCED), more popularly known as the Brundtland Commission after its chairperson Madam Brundtland, the former Prime Minister of Norway, was established by the UN in the mid 1980's. The commission held a series of private consultations with the leaders, experts, governments and people in different regions and published its landmark report called "Our Common Future" in 1987. In 1991, a revolutionary book was published: **Caring for the Earth** (IUCN/UNEP/WWF, 1991) whic h documented the principles and strategies for sustainable living.

Following the Brundtland Commission Report, the issues and concepts of sustainable development have been adopted by the UN as well as most of the countries and led to the UN General Assembly resolution in 1989 to hold a World Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil in 1992, also known as "Earth Summit". In Rio, over 110 Heads of States or Government officially signed four documents: i) the Rio Declaration; ii) Agenda 21; iii) the Framework Convention on Climate Change; and iv) the Convention on Biological Diversity (CBD). The CBD is the first global agreement on the conservation and sustainable use of biological diversity. Over 150 governments signed the document at the Rio conference, and since then more than 175 countries have ratified the agreement. The Convention reminds decision-makers that natural resources are not infinite and sets out a new philosophy for the 21st century – that of sustainable use.

Bangladesh perspective

A broad range of ecosystems are found in Bangladesh, including tropical evergreen forests, deciduous forests, mangrove forests, riparian and coastal wetlands, and the littoral, sub-littoral and benthic communities of the Indian Ocean. Over 50% of Bangladesh can be classified as wetlands (Khan *et al.*, 1994). Together with neighboring India, Bangladesh supports the largest remaining mangrove forest in the world – the Sundarbans. Bangladesh has a rich agro-biodiversity. Over 12,000 plant varieties have been recorded to date, representing a valuable, but rapidly vanishing, genetic resource. On the other hand, many of the faunal species are globally threatened, such as the Asian elephant, the Bengal tiger, the Gangetic gharial, the Ganges river dolphin and the hoolock gibbon, among others. Although it is not frequently recognized, Bangladesh supports a wealth of biodiversity, including 113 species of mammals, 628 species of birds, 126 species of reptiles, 22 species of amphibians, 708 species of freshwater and marine fishes, 400 species of mollusks, about 70 species of bees and as many species of wasps, about 5,700 species of angiosperms (68 woody, 130 fiber yielding, 500 medicinal, and 29 orchids), 1,700 species of pteridophytes, and 3 species of Gymnosperms (Nishat *et al.*, 2002). In 2000, the IUCN-Bangladesh Country Office published the **Red Book of Threatened Animals of Bangladesh**, which listed 43 species of mammals, 47 birds, 63 reptiles, 8 amphibians and 58 fish species as facing various degrees of extinction. According to the similar exercise recently completed by the Bangladesh National Herbarium, 106 vascular plant species face risks of various degrees of extinction in Bangladesh.

Table 1: List of threatened animals of Bangladesh

Group	Total no. of Living Species	Threatened Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Total	Not Threatened
Fishes	708	12	29	17	58	584
Amphibians	22	0	3	5	8	7
Reptiles	126	13	28	27	63	24
Birds	628	19	20	8	47	413
Mammals	113	21	15	7	43	17
Total	**1,597**	**65**	**94**	**59**	**219**	**1,045**

Source: IUCN Bangladesh, 2000

In the vast majority of extinctions, we will never know what we are missing. Only a fraction of the world's total number of species – estimated to be between 10 and 30 million – have been identified and described by science (Johnson, 1995). For instance, IUCN Bangladesh has very recently reported the sighting of the Asian leaf turtle (*Cyclemys dentata*) in the Chittagong Hill Tracts and black krait (*Bungarus niger*) from the Sundarbans mangrove forest, which were not nationally described to have occurred in the past. Moreover, IUCN Bangladesh has also reported the sighting of the Indo-Pacific hump-backed dolphin (*Sousa chinensis*) and Nypa mollusk (*Enigmonia aenigmatica*) in the Sundarbans mangrove forest of Bangladesh, which were also not nationally described earlier. But even if human society does not notice the passage of these anonymous species, it is clear that biological resources in their myriad forms are essential to human welfare.

The biodiversity of Bangladesh, however, faces a broad array of anthropogenic threats. With more than 130 million people, a population growth rate of 2.17 percent, and a population density of 800 people per km^2, the pressure on the nation's natural resources is intense. Population pressure, habitat loss and fragmentation, pollution, illegal killing and hunting are putting tremendous pressure on the existing biodiversity of the country. Hence, over the last 100 years, Bangladesh has lost about 10 percent of its mammalian fauna, 3 percent of its avifauna and 4 percent of the reptilian fauna (Khan, 1998). If the current trend is allowed to continue, many more of our precious species will end up in the following extinction list.

Table 2: List of wildlife extinctions in Bangladesh during the last century

Group	Common name	Scientific name	Past distribution
Reptiles	Marsh crocodile	*Crocodylus palustris*	Most of the rivers throughout Bangladesh
Birds	Pin-headed Duck	*Rhodonessa caryophyllacea*	Haor wetlands and some parts of mixed evergreen forest
	Common Peafowl	*Pavo cristatus*	Deciduous forests of Bangladesh
Mammals	One-headed Rhinoceros	*Rhinoceros unicornis*	Sundarbans, Garo hills, Valleys of Sylhet and wetlands of Mymensingh
	Asiatic Two-horned Rhinoceros	*Didermoceros sumatrensis*	From Comilla to Teknaf in the evergreen forest wetlands
	Javan Rhinoceros	*Rhinoceros sondicus*	Chittagong Hill Districts

Wolf	*Canis lupus*	Last sighted in Noakhali
Swamp Deer	*Cervus duvauceli*	Sundarbans and moist deciduous forest of Mymensingh
Hog Deer	*Axis porcinus*	Sundarbans and Sylhet
Gaur	*Bos gaurus*	All inland forests
Wild Buffalo	*Bubalus bubalis*	Low-laying chars in the southern districts, wetlands of Jessore, Sylhet, Mymensingh, Sundarbans and valleys of CHT
Nilgai	*Boselaphus tragocamelus*	From Tetulia to Barind tract
Banteng	*Bos benteng*	Inland forests

Source: IUCN Bangladesh 2000

A quiet revolution has been under way since the first half of the 1990's as, keeping the pace with the rest of the world, environmental sustainability, viz. sustainable development planning, has become a central theme of policymakers in Bangladesh. The Government's pro-nature commitment is reflected in the new Ministry of Environment and Forest (MoEF) and an upgraded Department of Environment (DoE). Moreover, the Government has also formulated some long-term sustainable environment management plans and programs, which will be discussed later on. There are two important national documents related to management of the environment in Bangladesh, which have subsequently been translated into programs: 1) the National Conservation Strategy (NCS); and 2) the National Environment Management Action Plan (NEMAP).

Policy intervention

National Conservation Strategy (NCS): The NCS aims to incorporate environmental considerations into the development planning process. The major objectives of the NCS are to provide a guide for development practitioners on the means to preserve or improve the environment while pursuing the goal of sustainable development. The NCS provides an overview of issues and develops a strategy, while NEMAP provides action plans for specific projects.

National Environment Management Action Plan (NEMAP): NEMAP is an environmental planning exercise that was initiated by the Government of Bangladesh through the MoEF following the commitments made under Agenda 21 at UNCED. The objectives of NEMAP are very similar to those of the NCS. The key element that distinguishes NEMAP from the NCS is the full participation of the common people, interest groups, resource users and stakeholders, NGOs and lobbyists in all phases of planning and implementation of its policies, programmes and projects (MoEF, 1991).

Environmental Policy and Action Plan, 1992: It provides sector-wise policy guidelines, which should be developed by the respective ministers. An implementation plan, appended to the policy, is an integral part of it. It outlines the actions that various Government agencies and NGOs should undertake to implement the policy.

Progammes for natural resources conservation

A considerable number of natural resources and biodiversity-related programs and projects are now in the planning stage or under the process of implementation. Some of the major programs which will be discussed briefly here are the NCS Implementation Project, Ramsar Site Conservation Initiative (Tanguar Haor), NEMAP Implementation Project, Sustainable Environ- mental Management Programme (SEMP), Sundarbans Biodiversity Conservation Project (SBCP), and Biodiversity Strategic Action Plan Project (BSAP). Moreover, there are also some initiatives that are in the process of implementation: Forestry Sector Project; Coastal and Wetland Biodiversity Management Project (CWBMP); Biodiversity Conservation in the Sundarbans Reserved Forest Project; the Strengthening of the Department of Environment Project, Integrated Coastal Zone Management Project, Forest Resource Management Project, Coastal Green Belt Project, etc.

National Conservation Strategy Implementation Project (NCSIP): MoEF started the NCSIP in 1994 with an aim to piloting conservation practices in selected ecosystems with financial support from the Norwegian Agency for Development Cooperation (NORAD). A number of projects have been planned under the NCSIP, among which are important projects such as Tanguar Haor Wetland Biodiversity Conservation, and Conservation of Coral Resources of Narikel Jinjira (St. Martin's Island).

Ramsar Site Conservation Initiative (Tanguar Haor): The NCSIP of MoEF initiated the Tanguar Haor Pilot Project in January 2000. The goal of the project is to ensure the long-term conservation of the globally significant biodiversity of Tanguar Haor. To this end, the project is looking into the restoration program to safeguard habitats important for maintaining biodiversity, curb threats to biodiversity, reduce pressures on the natural resources by means of resource substitution and a poverty alleviation program, and develop the local capacity for sustainable resource utilization.

NEMAP Implementation: NEMAP is now in its implementation phase. A number of development partners are implementing various segments of NEMAP. These include the United Nations Development Programme (UNDP), the World Bank, the Canadian International Development Agency (CIDA), and NORAD. Four projects are in progress. The Air Quality Monitoring Project (AQMP), Bangladesh Environment Management Programme (BEMP) and the Sustainable Environment Management Programme (SEMP) are in their final stages of implementation.

Sustainable Environment Management Programme (SEMP): With a grant of US$ 26 million, SEMP is UNDP's largest environ-mental programme across the world. It has 26 components being implemented by 21 sub-implementing agencies (Government: 08, Professional bodies: 02 and NGOs: 11). SEMP has five broad sub-programmes: a) Policy and Institution; b) Participatory Ecosystem Management; c) Community- based Environmental Sanitation; d) Advocacy and Awareness; and e) Training and Education. SEMP is intended to benefit the grass-roots level population and encourage the participation of women in the eco-specific intervention areas.

Sundarbans Biodiversity Conservation Project (SBCP): The MoEF, with financial support from the Asian Development Bank (ADB), initiated a project called the SBCP. The overall objective is to develop a sustainable management and biodiversity conservation system for all Sundarbans reserve forest resources on the basis of rational plans and the participation of all key stakeholders. **Biodiversity Strategic Action Plan (BSAP):** MoEF, with financial support from the Global Environment Facility (GEF)/UNDP, recently launched the BSAP project. BSAP will focus mainly on building a unifying framework to guide and coordinate various biodiversity-related programmes and projects that are now under implementation, identifying national biodiversity priorities, or allocating lead responsibilities. Hence, the BSAP will reflect the biodiversity conservation aspirations and will build on existing national strategies and plans. The project will allow Bangladesh to meet its obligations under the CBD.

Legal mechanism for natural resource management

The conservation and management of the nation's natural resources is the responsibility of many different government bodies, including the MoEF, Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Land, and Ministry of Water Resources. The Forest Department (under MoEF) is a specialized body dealing with the management of forest reserves, wildlife and protected areas. The DoE is another specialized body under the MoEF, dealing primarily with 'brown' and 'grey' issues in the environment sector. Responsibilities, communication channels and coordination mechanisms among the many different ministries and departments remain poorly defined and unclear.

Many of the nation's natural resource management laws and policies have their origins in the British colonial period. As a result, they are no longer suited to present day needs for the conservation of biodiversity and the sustainable use of its components. Similarly, important aspects of the obligations under the CBD – such as access to genetic resources – have yet to be accorded legal backing.

The first major law that was promulgated for the specific purpose of conservation of nature and protection of environment is the Environmental Conservation Act of 1995, which was followed by the Environmental Conservation Rules (ECR) of 1997. In addition, there are around two hundred laws in Bangladesh, which have, in some cases, direct relevance to the environment. In most cases, the primary objective of these laws does not concern natural resource management or address environmental pollution directly. Recently, the Government passed the Environmental Court Act, 2000 to deal with environmental offences more effectively. The Act provides for the establishment of one or more Environmental Courts, primarily in each division of the country, with specific terms of references to deal with environmental offences. It is envisaged that the court will facilitate speedy disposal of cases concerning environmental offences as defined in the Environmental Law.

The road ahead

As Noss (1993) observed, it is sustainability that depends on biodiversity, not the other way around. However, conservation in Bangladesh is still being regarded as a negative factor generally deterring development. However, as a signatory to the CBD and Agenda 21, which envisaged the sustainable use of biological resources, policy and lawmakers in Bangladesh must understand the implications of the conservation issues.

We have come a long way towards defining the norms of sustainable development. We have revised our policies, ratified international conventions, treaties and protocols, developed and adopted new strategies, implemented new programmes and projects – all of which are meant to ensure sustainable development. Yet, we are still miles behind in translating all these excellent instruments into actual practice. More importantly, conservation issues for protection of habitats and wildlife are still not given due importance. Biologists typically involved in setting conservation priorities often fail to realize a simple fact of life that helps to explain why conservation priorities are so often ignored, which is that in most circumstances, effective conservation is ultimately, for better or worse, a political process whose chances of success are improved through wider participation. Therefore, one of the key prerequisites for launching a successful conservation initiative is a national political consensus. Multi-stakeholder involvement and ownership in decision making is a precondition for a holistic development, i.e., sustainable development. Without such a consensus, the key challenges of environmentally sound, socially justified and equitable economic development will be a far dream.

Acknowledgments

The author is grateful to Professor Anuin Nishat, Country Representative, IUCN-Bangladesh Country Office, who extended his support and technical assistance. Special thanks to Sabir Bin Muzaffar for his input.

References

IUCN/UNEP/WWF. 1980. **World Conservation Strategy.** IUCN, Gland, Switzerland.

IUCN/UNEP/WWF. 1991. **Caring for the Earth: A Strategy for Sustainable Living.** IUCN, Gland, Switzerland.

IUCN Bangladesh. 2000. **Red List of Threatened Animals of Bangladesh.** IUCN-The World Conservation Union, Bangladesh Country Office, Dhaka, Bangladesh. xi+54 pp.

Johnson, N. 1995. **Biodiversity in the Balance: Approaches to Setting Geographic Conservation Priorities.** Biodiversity Support Programme. WWF/The Nature Conservancy/ World Resources Institute, Washington, DC. 2006.

Khan, A. 1998. **Biodiversity**. In: Gain, P. (Ed.) *Bangladesh Environment: Facing 21st Century*. SHED, Dhaka, Bangladesh.

Khan, M.S., Haq, E., Huq, S. Rahman, A.A., Rashid, S.M.A., and H. Ahmed (Eds.). 1994. **Wetlands of Bangladesh.** Bangladesh Centre for Advanced Studies. Dhaka, Bangladesh. Xvi+91 pp.

Miller, K.R. and Tangley, L. 1991. **Trees of Life: Saving Tropical Forests and Their Biological Wealth.** Beacon Press, Boston.

MoEF. 1991. **National Environmental Management Action Plan.** Progress Review.

Nishat, A., Huq, S.M. Imamul, Barua, Shuvashish P., Reza, A.H.M. Ali, and Moniruzzaman A.S. Khan. (Eds.). 2002. **Bio-ecological Zones of Bangladesh.** IUCN Bangladesh Country Office, Dhaka, Bangladesh, xii+141 pp.

Noss, R.F. 1993. **Sustainable Forestry or Sustainable Forests.** In: G.H. Aplet, N. Johnson, J.T. Olson, and V.A. Sample (Eds.) *Defining Sustainable Forestry.* Island Press, Washington D.C. 17-43 pp.

Raup, D.M. 1998. **Diversity crises in the geologic past.** In: E.O. Wilson and F.M. Peter (Eds.), *Biodiversity.* National Academy Press, Washington D.C. 51-57 pp.

Author's address: c/o Department of Zoology, Jahangirnagar University, Savar, Dhaka 1342, Bangladesh; E-mail: wild_reza @hotmail.com

Contents

FOREST NEWS

FOREST NEWS

Vol.XVIII:No.2

ASIA-PACIFIC FORESTRY COMMISSION CONSIDERS REGIONAL FORESTRY ISSUES

Representatives from 29 member countries, along with observers and representatives from 7 international organizations and 5 international non-governmental organizations, met in Nadi, Fiji, 19-23 April 2004, to consider possible actions to deal with critical issues facing the forestry sector in the region. The twentieth session of the Asia-Pacific Forestry Commission (APFC) was organized by FAO and the Fijian Ministry of Fisheries and Forests. The 29 countries participating eclipsed the record set for an APFC session two years ago in Mongolia.

His Excellency Konisi T. Yabaki, Minister of Fisheries and Forests, Government of Fiji, presided over the meeting as Chairperson. N.K. Joshi (India), Sohn Chan-Joon (Republic of Korea) and Thang Hooi Chiew (Malaysia) were elected Vice Chairpersons for the session. David Rhodes (New Zealand) served as Rapporteur.

While several ongoing international dialogues are addressing forest-related issues at the global level, forestry experts at the APFC session focused on regional initiatives and cooperation among Asia-Pacific countries. The following paragraphs summarize the conclusions and recommendations related to specific agenda topics discussed in the Nadi session. Copies of the full report of the APFC session are available from the FAO Regional Office for Asia and the Pacific (see also: hhttp://www.apfcweb.org/events).

State of forestry in the region

Delegates concurred with FAO's Report on the "State of forestry in the region." They acknowledged many of the common threats to the region's forests, including continued deforestation and degradation of natural forests, illegal and uncontrolled logging, invasive species, forest fires, unmanaged recreation and competition from alternative land uses. The delegates further stressed that the countries were tackling these problems through a variety of measures, but were sometimes constrained by weak institutional capacity, insufficient budgetary resources and inadequate political will.

Nevertheless, several countries reported that deforestation had been curbed or even reversed, although the loss and degradation of natural forests were continuing. Countries generally reported increased use of criteria and indicators, certification, reduced impact logging, and participatory approaches in forest management. A number of countries also expressed concern over declining investments in the forestry sector. On the positive side, the delegates further reported on the increased regional and bilateral cooperation in addressing illegal logging and associated illegal trade of forest products.

Based on the presentations and the interventions from the delegates, the Commission concluded

that members were making progress toward sustainable forest management as a result of reorientation of policies, decentralization and devolution of forest management, application of best management practices, expansion of protected areas, acceleration of plantation development and rehabilitation of degraded areas. The Commission further acknowledged the importance of conserving biological resources effectively, as well as the significance of effective watershed management to ensure reliable supplies of clean water.

Based on the discussions, the Commission recommended that:

- member countries take further action to implement internationally agreed upon actions related to forests, especially the IPF/IFF proposals for action;
- FAO expedite its efforts to help countries build capacity for sustainable forest management, especially by facilitating interaction among countries and by organizing workshops and training sessions at the regional, sub-regional and national levels;
- member countries and FAO explore new avenues for obtaining financing for sustainable forest management, including through partnerships with the private sector;
- member countries increase collaboration in dealing with illegal logging and associated illegal trade of forest products, and FAO was urged to provide additional technical support and to assess the costs and impacts of illegal logging;
- FAO continue promoting conservation of biological resources; and
- FAO continue providing sound information on relationships between forests and water, including flooding, and on successful watershed management approaches.

Forestry activities of interest to the region

The Commission reviewed APFC and FAO-supported forestry activities carried out during the past two years, including follow-up to recommendations of the nineteenth session of the Commission. The activities generally concentrated on four areas: a) ensuring sustainable supplies of wood and fiber; b) continuous improvement in forest management; c) devolution of forest management responsibilities; and d) cross-cutting initiatives. The Secretariat clarified that many regional activities supported by FAO were carried out within the framework of the Asia-Pacific Forestry Commission to take advantage of the opportunities for multi-country and multi-organization collaboration.

The delegates stressed the need for accurate and relevant data to support forest management planning and decision making. The Commission acknowledged the value and usefulness of the information disseminated under the Global Forest Assessment, the Asia-Pacific Forestry Sector Outlook Study, and the State of Forestry in Asia and the Pacific – 2003. FAO was requested to regularly collect and disseminate such information in collaboration with APFC member countries. Member countries also agreed to continue promoting the development and use of criteria and indicators for sustainable forest management and requested FAO to support this work. Further, the delegates noted the positive advances of many member countries in formulating and implementing national codes of practice for forest harvesting, consistent with the Code of Practice for Forest Harvesting in Asia-Pacific developed by APFC. Finally, the delegates acknowledged the importance and relevance of the international dialogue on forests for its member countries, but observed that many countries were unable to fully participate due to limited resources and capacity.

On the basis of the above clarification and interventions from the delegates, the Commission made the following observations and recommendations:

- It acknowledged the relevance of recent APFC and FAO-supported activities in the region and noted with appreciation the follow-up actions that had been taken on the recommendations of the nineteenth session.
- It stressed that despite much positive work initiated by member countries to develop and implement national forest programmes, there is further need to develop and implement the programmes. FAO and the

National Forest Programme Facility were requested to increase their support.

- FAO should continue efforts to enhance national capacities for conducting forest resource assessments, including assessment of tree resources outside forests.
- The seven thematic areas of sustainable forest management, as acknowledged by the International Conference on Criteria and Indicators in Guatemala (February 2003), the fifteenth session of the Committee on Forestry (March 2003) and further discussed at the recent FAO/ITTO Expert Consultation in the Philippines (March 2004), should be used as globally agreed criteria for sustainable forest management, for harmonizing purposes.
- FAO should develop practical guidelines for the sustainable use of non-wood forest products, and work to improve marketing of such products.
- FAO should continue providing support for the implementation of codes of practice and the application of improved forest harvesting.

The Commission endorsed the establishment of the Asia-Pacific Forest Invasive Species Network, under the auspices of APFC. It urged FAO and member countries to support the network as a mechanism for sharing information on existing and potential forest pests and approaches for combating such pests. FAO was requested to work with member countries to mobilize funds to effectively manage the network.

FAO was further commended for its leadership in supporting the work of the Consultative Partnership on Forests (CPF). The Commission urged FAO to continue providing strong support for the CPF. The Commission encouraged FAO and other CPF members to further simplify reporting in order to reduce the burden on countries and to continue efforts to harmonize concepts, terminology and definitions used in assessing, monitoring and reporting on sustainable forest management.

In search of excellence: exemplary forest management in Asia and the Pacific

During a special in-session seminar, the Commission reviewed preliminary results from an APFC initiative to identify instances of exemplary forest management in the region. The *In Search of Excellence* initiative has resulted in more than 170 nominations of forests considered to be well managed, covering 20 countries. The nominations represent a broad range of forest types, management objectives, scale of operations and ownership patterns, reinforcing the premise that there is no single definition of exemplary forest management. Common elements contributing to excellence include societal consensus on management objectives and approaches, attention to livelihoods for forest-dependent people, application of best management practices, and strong commitment to attaining excellence.

The delegates noted the potential for the initiative to help counter the preponderance of negative publicity on forestry and to serve as a catalyst in motivating further improvements in forest management. They recognized that the initiative had stimulated healthy debate among stakeholders on what constitutes good forest management and how to achieve it, and they acknowledged the potential to transfer lessons and experiences from case study forests to similar situations throughout the region. Delegates also recognized the common elements of good forest management which could guide forest management in a variety of contexts.

The Commission appreciated the approach and process used in undertaking the initiative, particularly the emphasis on recognizing and accentuating positive experiences in forest management. Delegates noted that strong bonds tend to link exemplary forest managers to their forests. They further recognized the importance of discernable "champions" in promoting excellence in forest management. An additional key to successful management relates to ensuring the extensive involvement of all stakeholders in establishing the parameters and goals for forest management, especially at local levels.

A publication featuring the 28 case studies and supporting analysis will be brought out in the near future. The Commission recommended that the results of the *In Search of Excellence* initiative be widely distributed and promoted through media briefings, workshops, and the preparation of materials to help managers of nominated forests to promote a common message. The Commission also suggested that FAO consider organizing a side meeting at the next session of the Committee on Forestry (COFO) to feature the initiative.

Financing sustainable forest management

The Commission considered the challenges of securing adequate financing for sustainable forest management. Several member countries shared their experiences in developing innovative funding approaches to support forest management and conservation. Some have established special funds that are financed by voluntary contributions, taxes and fees, donor grants and other sources. Others are testing mechanisms for compensating the provision of environmental services and developing markets for previously non-marketed goods and services.

The costs of fully implementing sustainable forest management were recognized to be significantly above current expenditure levels. However, the delegates did point out that countries with valuable commercial forest resources could potentially finance sustainable forest management by improving prices and taxation systems, strengthening measures for collecting royalties and fees, and controlling illegal activities. Success depended on effective policies and a supportive legal system.

Delegates also acknowledged the potential to generate income and employment from non-wood forest products, environmental services (e.g. carbon sequestration, provision of clean air and water) and ecotourism. The actual realization of such benefits is currently limited, however, and their significance as a source of funding for forestry is still to be determined.

Considering all the challenges and the potential opportunities for securing financing, the Commission encouraged FAO to:

- strengthen its work with donor countries and financial institutions to help facilitate the efforts of developing countries to achieve sustainable forest management;
- continue providing information and advice related to potential sources of financing for sustainable forest management;
- facilitate the exchange of information and experience related to the economic valuation and development of markets for non-wood forest products, environmental services and ecotourism;
- continue raising awareness of the contributions that forests make to the environment, rural development, poverty alleviation and other economic sectors;
- maintain efforts to ensure that sound scientific knowledge on the actual benefits provided by forests and trees is readily available to decision makers; and
- distribute information on guidelines for assessing the magnitude of environmental services provided by forests and the impacts of unsustainable forest management and forest clearing.

Alternative forest management models

During a special in-session seminar, the Commission focused on alternative forest management models to achieve sustainability. Five resource speakers from the region spoke about decentralization, devolution, privatization and the model forest approach compared to the approaches currently carried out by government agencies.

The delegates noted that member countries were increasingly testing and applying innovative forest management models in an attempt to deal more effectively with the pressures being exerted on forests from population growth, agricultural expansion, increasing demand for forest products, industrial development and rapid economic growth. Promising models typically transfer forest management authorities and responsibilities to local governments, civil society and the private sector. Increased

involvement of stakeholders, secure resource tenure, innovative partnerships, increased equity and application of landscape approaches to management are common elements of success.

The participants reviewed experiences with decentralization and devolution of forest management, community-based forest management, the model forest approach to sustainable forest management and transfer of management roles to the private sector. Delegates pointed out that extensive experience had been gained with some approaches, such as community forestry, while others, such as the model forest approach, had been introduced only recently.

Delegated noted that the processes of devolution and decentralization of forest management had not always been smooth, and at times had stalled as a result of conflicts between local governments and forest users. Moreover, foresters had sometimes been perceived as being reluctant to participate in, or lead, the process of devolution and decentralization, or had even been perceived as being opposed to these trends.

Delegates confirmed an increasing trend in the region to involve the private sector in forest management through long-term lease arrangements, management concessions and privatization of forest resources. While the benefits of such approaches may be substantial in the long term, privatization in some cases may have negative social and environmental implications in the near term. Acceptable risk is essential for success, and this is heavily influenced by the operating environment within countries.

The Commission appreciated the positive experiences of several countries in implementing the model forest approach to sustainable forest management, with support from FAO and donors.

The Commission made the following recommendations:

- Considering that existing model forests in the region still require financial support to achieve their full potential, and that several additional countries were interested in applying the model forest approach, FAO should continue discussions with donors to secure funding for a proposed regional model forest network in Asia and the Pacific.
- FAO should review the changing needs, demands and expectations placed on forestry agencies in reorienting, retraining and restructuring as appropriate.
- FAO should continue to monitor experiences in implementing alternative forest management models, disseminate information on such experiences and support efforts to strengthen capacities for effective implementation.

Delegates agreed that none of the alternative forest management models eliminated the need for government forestry agencies. Rather, the roles of forestry agencies may be altered under the new modalities, and the skills needed to facilitate these new approaches may differ from those needed in the past.

Forest conventions, treaties and more: are regional agreements the way to go?

The Commission considered recent developments related to global, regional and bilateral forest-related agreements and arrangements. Delegates expressed their views about the value and feasibility of various options for international and regional approaches, including legally and non-legally binding options.

The Commission recommended that member countries actively participate and provide forestry expertise in the intergovernmental negotiations related to forests, especially the United Nations Forum on Forests (UNFF) and the conventions on biological diversity, desertification and climate change.

The Commission recognized the need for thorough regional preparations prior to the fifth session of UNFF in 2005, which will decide on future international arrangements on forests. The Commission requested FAO to examine the possibility of organizing an inter-sessional meeting for this purpose, or to provide other mechanisms to assist countries' preparations.

The Commission recognized the value and practical benefits of existing regional forest-related agreements and initiatives and urged member countries to strengthen their commitment to implement them. FAO and other international organizations were requested to continue their support for the effective implementation of these regional mechanisms.

Regional issues identified by the Commission for the attention of COFO

The Committee on Forestry (COFO) has expressed a desire to see regional forestry commissions strengthened. In this respect, the Commission wished to bring to the attention of COFO the renewed vitality of the APFC, as demonstrated by the large number of important inter-sessional activities in the past two years and the record level of participation at the twentieth session. The Commission also emphasized that these activities were achieved largely as a result of the commitment and contributions of member countries themselves. Further, the Commission would like to bring to the attention of COFO a number of issues, including the following:

- FAO and other CPF members have continued to support member countries in implementing the IPF/IFF proposals for action through effective national forest programmes, consistent with the recommendations of COFO. The important role of the National Forest Programme Facility was highlighted as well.
- Cognizant with the global concern over illegal logging and associated trade, FAO has been requested to provide additional technical support to help member countries control such activities, and assess their costs and impacts.
- FAO has been requested to examine the potential strengths and weaknesses of regional and global arrangements on forest fires, including the feasibility of developing and implementing a global agreement on fire.
- Awareness needs to be raised on the serious threats from invasive species, and the need to build capacities for dealing with such threats. The establishment of the Asia-Pacific Forest Invasive Species Network, created under the aegis of APFC, is a significant achievement.
- The supply and use of fresh water has become globally significant, and the complex linkages between forests and water are often poorly understood. FAO has been asked to continue providing sound scientific information on relationships between forests and water, including flooding, and on successful watershed management approaches.
- Progress has been made by many member countries in the region in formulating and implementing national codes of practice for forest harvesting, consistent with the regional code developed under the auspices of APFC. The approaches and experiences of Asia-Pacific countries in developing and implementing such codes of practice could provide a useful model for other regions.
- The *In Search of Excellence* initiative has been highly successful, resulting in more than 170 nominations of forests throughout the region considered to be well managed. The initiative helped showcase positive experiences of forest management and heightened consideration of what constitutes good management. The activities under the initiative are to be continued, results further disseminated, possibly including through a side meeting at the next session of COFO.
- There is widespread interest in the potential to generate income and employment from non-wood forest products, providing environmental services and ecotourism. FAO has been asked to facilitate the exchange of information and experience related to the economic valuation and the development of markets for these products and services.
- Forest management approaches are evolving rapidly throughout the world, including through the use of criteria and indicators to assess, monitor and report progress toward the achievement of sustainable forest management. FAO has been asked to review the changes, the new skills and capabilities needed, and assist the forest agencies in reorienting, retraining and restructuring them as appropriate.

Other business

Two workshops were held before the main APFC session: 1) the Regional Workshop on Implementing IPF/IFF Proposals for Action through National Forest Programmes: Strategies, Initiatives and Tools; and 2) the Workshop on Developing an Action Plan for Addressing Forest Invasive Species in Asia and the Pacific. Reports on both workshops were presented to the Commission (see also below in this issue of *Forest News*).

The report on the First Meeting of the Asia-Pacific Forestry Commission Executive Committee was presented to the Commission. The Executive Committee had conducted an analysis of APFC's strengths, weaknesses, opportunities and threats, and made recommendations related to the following: a) enhancing the profile of APFC; b) enhancing the involvement of member countries in APFC activities; c) increasing the participation of the private sector and NGOs in APFC activities; d) increasing funding support for APFC activities; e) streamlining and clarifying the way APFC functions; f) increasing the roles and responsibilities of the Executive Committee; and g) strengthening the APFC Secretariat. The Commission endorsed the report of the meeting and its recommendations. It recognized the valuable contributions of the Executive Committee in reviewing and guiding the work of the Commission and recommended that regular meetings of the Executive Committee be convened between the main sessions of the Commission, giving due consideration to budget implications.

Information items

Forest fires remained a key concern of member countries. The Commission was informed of the outcome of the International Wildlife Fire Summit, convened in Sydney, Australia, in October 2003, and recent developments related to the establishment and implementation of international wildland fire agreements. Several bilateral and regional agreements exist to facilitate cooperation in managing and combating wildland fires, including the ASEAN Agreement on Transboundary Haze Pollution. These issues, including options for developing a global fire agreement, can be discussed at the sixteenth session of COFO in 2005. The same can be taken up further at the Ministerial meeting the Director-General intends to convene at the time of COFO.

The Commission encouraged member countries and FAO to intensify regional collaboration on combating and preventing forest fires, and provide strong support for the effective implementation of existing fire agreements. It requested FAO to assist member countries in the formulation and implementation of effective training programmes to prevent, control and manage forest fires. FAO was also asked to examine the potential strengths and weaknesses of regional and global arrangements on forest fires, including the feasibility of developing and implementing a global agreement on forest fires, taking into account the lessons learned from the development and implementation of existing bilateral and regional arrangements.

The Commission was informed of the outcomes of the XII World Forestry Congress, and noted that the Asia-Pacific region had been well represented at the Congress, with more than 250 participants and a high number of written contributions.

Date and place of the next session

Offers to host the twenty-first session of the APFC (to be convened in 2006) were made by the delegations from India, Philippines and Viet Nam.

PRE-SESSION ASIA-PACIFIC FORESTRY COMMISSION WORKSHOP "IMPLEMENTING IPF/IFF PROPOSALS FOR ACTION THROUGH NATIONAL FOREST PROGRAMMES: STRATEGIES, INITIATIVES AND TOOLS"

The Regional Workshop on Implementing IPF/IFF Proposals for Action through National Forest Programmes: Strategies, Initiatives and Tools was organized by FAO and hosted by the Government of Fiji, 16 to 17 April in Nadi, Fiji. It was held in conjunction with the twentieth session of the Asia-Pacific Forestry Commission. The workshop was co-sponsored by the U.S. Department of State/USDA Forest Service, the German Agency for Technical Cooperation (GTZ) projects in Fiji and Indonesia, and the National Forest Programme Facility. It brought together 67 experts from various countries, members of the Collaborative Partnership on Forests (CPF) and other international, regional and sub-regional organizations, including non-governmental organizations.

The keynote address was given by H.C. Thang (Malaysia) on "Implementation of the IPF/IFF Proposals for Action at the national level." His principal position is that each country should design its own national approach for assessing and integrating the IPF/IFF Proposals for Action (PA). Only through this means it is possible to address issues of common concern of all stakeholders from the private sector, non-governmental organizations and governments. Next, not all PAs are relevant to all countries, and so a useful first step would be to analyze which Proposals are relevant and prioritize them for action. Implementation of the IPF/IFF PAs should serve as a process to assist countries to adopt policies and strategies for a holistic and cross-sectoral approach to the management, conservation and sustainable development of forest resources, and as a means to progress towards the attainment of sustainable forest management. In addition, the implementation of the IPF/IFF PAs and the use of criteria and indicators for sustainable forest management would adequately address the activities of the CBD's Expanded Programme of Work on Forest Biological Diversity, as well as its Ecosystem Approach to managing natural ecosystems.

The keynote address was followed by three introductory papers, as follows:

- Implementing national forest programmes: small steps for big changes – S. Appanah & E. Mansour (FAO, Bangkok and Rome, respectively)
- Addressing priority cross-sectoral issues in the Asia-Pacific region to support national forest programme implementation – J. Rodgers and A. Sisifa (Fiji)
- Strengthening local stakeholder participation in national decision making – P. Walpole (Philippines)

The three presentations discussed how forest policies are being made more holistic and cyclical in approach with the implementation of the national forest programmes, cross-sectoral considerations in executing forestry plans, and how governments' planning is currently being influenced from bottom-up processes ongoing in many countries in the region.

Following the introductions, the workshop held three working groups, on the following topics:

- Stakeholder participation – Case studies from Australia (E. Jimenez) and Indonesia (Agus Justianto) on how stakeholders participate effectively in national forest programme processes;

- Cross-sectoral cooperation – Case studies from Vietnam (Vu Van Me) and Bhutan (Dechen Dorji); and
- Forests and poverty reduction – Case studies from India (K. Balasubramaniam) and China (Liu Jinlong).

The three groups formulated recommendations on how countries can enhance multi-stakeholder participation, increase linkages between forestry and other sectors using the national forest programme process, and strengthen the contribution of forests to poverty alleviation.

The final session explored effective approaches and knowledge sharing tools for implementing Proposals for Action. Presentations were made on:

- National assessment of Vanuatu's progress in implementing the IPF/IFF Proposals for Action – a tool to assist countries to measure progress and establish priorities for sustainable forest management – P. Lawrence and H. Tate (Australia & Vanuatu);
- The National Forest Programme Facility – T. Enters (FAO, Bangkok;
- Implementing the IPF/IFF Proposals for Action in Indonesia – 5 years of experience – Agus Justianto (Indonesia)
- Implementing proposals for action to promote SFM in New Zealand – J. Eyre (New Zealand)

The session's speakers highlighted the opportunities available for countries to implement national forest programmes, tools to measure progress, and how even in the absence of specific national forest programmes, the proposals for action can still be incorporated and implemented in practice.

The workshop served as a forum to exchange country experiences and to catalyze efforts to implement the Proposals for Action, especially through the national forest programmes. It also provided an opportunity to inform experts about recent support initiatives, and the developments in international forest dialogues, especially the United Nations Forum on Forests (UNFF).

Many participants described increasing efforts to categorize, assess, prioritize and implement the relevant Proposals for Action, despite the limited capacity to implement them and to report on progress, partially due to overwhelming reporting requests by international processes. They recommended that countries should work on boosting the implementation, effective stakeholder participation, cross-sectoral cooperation, and increase the contribution of forests to poverty alleviation.

Participants recommended that countries should, for instance, develop procedures and modalities for effective stakeholder participation in the national forest programme process, including clearly identifying the roles of stakeholders and means to account for their inputs; establish high-level, cross-ministerial collaboration mechanisms, extend devolution of forest management from degraded forest areas to production forest areas, review methods of valuing forest goods and services, and help the poor to organize themselves.

They also recommended that FAO and other CPF members should continue to facilitate the implementation of the Proposals for Action and assist countries in sharing experiences and building capacity for effective participation in international forest-related deliberations. In addition, the participants stressed the importance of including forestry expertise in the national delegations that attend the negotiations.

"Nature does not complete things. She is chaotic. Man must finish, and he does so by making a garden and building a wall."

-- Robert Frost --

ASIAN FORESTERS PLAN FOR COMBATING INVASIVE SPECIES

Experts from 14 countries met in conjunction with the twentieth session of the Asia-Pacific Forestry Commission (APFC), in Nadi, Fiji, 17-18 April 2004, to design a collaborative plan of action to help combat the threats posed by invasive species in the region. The costs of invasive species in the region total hundreds of billions of dollars each year, in terms of treatment measures, environmental impacts and lost production – with the costs to forestry constituting a significant proportion of this total.

The workshop on *Developing an Action Plan for Addressing Forest Invasive Species in Asia and the Pacific* reviewed the list of potential activities prepared during the *Asia-Pacific Invasive Species Conference* held in Kunming, China, in August 2003 – adding to these, deleting as appropriate, and identifying priority areas.

The workshop validated the recommendation made by the Kunming conference to establish an Asia-Pacific Forest Invasive Species Network under the auspices of APFC. A consensus also emerged on five high priority areas for action:

1. Organizational structures to support the network

As an APFC-sanctioned initiative, the Network will be supported by the APFC secretariat.

Country-nominated focal points will be important links in the functioning of the Network. Focal points will also be responsible for coordinating Network activities within countries, and for facilitating the timely exchange of information. To date, 21 countries have designated their focal points. The country focal points will also provide linkage between the Network and other regional and global forest invasive species initiatives.

2. Stock-taking of national activities

The Network will complete a stock-taking exercise of national activities currently being implemented on forest invasive species. A starting point will be the review of country reports prepared for the *Asia-Pacific Forest Invasive Species Conference* to identify gaps potentially requiring capacity building. The Network will prepare guidelines to assist in standardizing the information reported in the original country reports and during national stocktaking exercises.

3. Awareness raising

The Network will collaborate in the development of a regional awareness strategy for forest invasive species. The strategy will include an outline of objectives and identify target audiences and measures that can be implemented to raise regional awareness about forest invasive species.

4. Capacity building

Opportunities for collaboration on specific capacity-building activities will be identified through national stocktaking exercises. The Network will also implement other specific capacity-building opportunities identified and deemed appropriate by member countries.

5. Database and information sharing

The national focal points will play a key role in facilitating the exchange of information on forest invasive species among Network members. Several mechanisms could be developed to facilitate information exchange including website development, newsletters and/or a regional forest invasive species listserver.

The Chinese Academy of Sciences has commenced work on developing a forest invasive species database, which will provide a system for collating, storing and readily accessing information gathered by the national focal points from the region. The database will be further developed in collaboration with Network members, cognizant of cross-sectoral boundary issues.

The workshop discussed these priority activities in detail and identified specific actions to be completed prior to the next session of the Asia-Pacific Forestry Commission in 2006. The activities will comprise elements of a regional action plan. Among the most significant is the development of a forest invasive species database (work led by the Chinese Academy of Sciences). It is anticipated that focal points will play a key role in facilitating the exchange of information and coordinating other activities within countries.

The second day of the workshop in Fiji encompassed a wider audience of APFC delegates and focused on raising awareness of issues related to forest invasive species.

Mr. Hosny El-Lakany, FAO Assistant Director-General for Forestry, used the occasion to formally announce the establishment of the *Asia-Pacific Forest Invasive Species Network*.

ONLINE HELP AND ADVICE ON OBTAINING FUNDING FOR FORESTRY RELATED PROJECTS

(English) http://www.fao.org/forestry/site/17261/en
(French) http://wwww.fao.org/forestry/site/1726/fr

The above links lead to fora that have been set-up by the Collaborative Partnership on Forests' CPF-Sourcebook and the National Forest Programme Facility to allow people to share information, ideas and experiences on funding for forestry related projects – forestry, forest products, forest management and forest sustainability projects. The online help is aimed at assisting fund seekers to further and enhance their funding search as well as increasing their skills on how to go about soliciting funding for their projects. Representatives of grant-making bodies are also invited to post news and advice for potential applicants.

For more information and guidance on how to post messages see the following URL: http://www.fao.org/forestry/foris/webview/pageview.jsp?pageId=25608&langId=1

"You can't stay in your corner of the Forest waiting for others to come to you. You have to go to them sometimes."

-- Pooh's Little Instruction Book, inspired by A.A. Milne --

WHAT WERE THE MOST SIGNIFICANT DEVELOPMENTS IN THE FORESTRY SECTOR IN ASIA-PACIFIC IN 2003?

At the beginning of 2004, FAO conducted an e-mail survey to ascertain what people involved in forestry in the region considered to be the most important developments in forestry in their own country, and in the region as a whole in 2003. Comments were received from more than 65 individuals, providing a range of perspectives.

Two themes were emphasized:

- Illegal logging and governance issues
- Decentralization and devolution of forest management

Illegal logging was the most frequently mentioned issue at the regional level. This is interesting since illegal logging is usually considered to be a national issue, yet very few respondents indicated that it was important for their own country over the past year. Several initiatives are currently being undertaken to address illegal logging in the region.

Many respondents indicated that decentralization and devolution (in various forms) were significant developments in their particular country over the past year. This matches with the ongoing trends throughout the region towards the devolution of responsibilities and rights to local communities.

The results of the survey are summarized below. They are not listed in any particular order, nor do they necessarily reflect the views of FAO or *Forest News* editors.

1. What was the most significant issue, development or event that occurred in your country in 2003 that had (or will have) significant impact on forests or forestry?

Responses:

Australia

- Development of the Australian forest certification standard
- Large wildfires in early 2003, which led to a review of the organization of fire control, the management of prescribed burning practices and the planning of plantation layouts
- Public debate over water use by plantations and the extent to which plantation expansion should be regulated
- Controversy about logging of Tasmanian old-growth forests
- Approval/release of National Plantations Strategy to 2020

Brunei

- The drafting of the "*Forest Act and Forest Rules*" subsequently submitted to the Attorney General for further review and approval

Cambodia

- Passage of the Community Forestry Sub-Decree
- Increasing role of commune (smallest unit of government) in land-use planning
- Appointment of SGS as the new forest monitor, replacing Global Witness

China

- Implementation of the six key national forestry programs:
  - Natural forest protection program
  - Program for conversion of cropland to forest and grass land
  - Program to combat desertification in Beijing and Tianjin
  - Shelterbelt development program for the middle and lower reaches of the Yangtze river

- Wildlife conservation and building of nature reserves program
- High yield timber plantation development program

India

- The international conference on - *Quality Timber Products of Teak from Sustainable Forest Management (SFM)* in Kerala (December 2003)
- Formation of the National Forestry Commission
- Greater role of the National Medicinal Plants Board in the conservation, development, marketing and exports of medicinal plants in the country
- Diminishing role of foresters in biodiversity conservation
- Creation of two categories of private protected areas, *community reserves* and *conservation reserves*, which recognize and legitimize private conservation initiatives

Indonesia

- "There were no significant developments (business as usual) – the reform process stopped"
- Launching of the National Social Forestry Programme
- Launching of the National Rehabilitation Programme (of watershed management areas)
- Inclusion of forest-related crimes in the anti-money-laundering law
- Increasing attention on illegal logging and how to combat it
- Reduction of the AAC from approximately 12.1 million m^3 to 6.89 million m^3
- Discussions on agrarian reform and natural resource management
- Reforestation declarations by the government responding to the many natural disasters in Indonesia during the year – especially floods and landslides

Japan

- Development of the Sustainable Green Ecosystem Council for forest certification
- Development of an action plan and approval of a budget to support the international commitments under the Kyoto Protocol, including an increase of carbon sinks through sustainable forest management
- "Green Recruitment Program" initiated to increase the number of skilled forest workers by providing local governments and forest cooperatives with financial assistance for employment and training

Korea

- Entering into force of the new Forest Land Management Law
- Revision of the 4^{th} forest development plan (the national forest plan for the period 1998-2007)
- Establishment of the "Act for the Protection of the *Baekdoo Mountains*"
- The damage wrought on Korean forests by giant typhoon "Maemi"
- Reform of the Korea Forest Service
- The presidential election in 2002
- Nation-wide survey of mountain villages in Korea

Lao PDR

- Limited acknowledgement of forestry in the National Poverty Eradication Programme published in 2003, reflecting poor recognition of the opportunities for forestry to contribute to poverty reduction
- Debate and approval of national "Forest Strategy 2020"

Malaysia

- Implementation of criteria and indicators for assessing and monitoring sustainable forest management at the forest management level
- Reduction in the loss of forest biological diversity and damage to the environment during forest harvesting, and an increase in the extent of protected areas
- DNA analysis for tree tracking

Myanmar

- Increase in awareness and interest in "community forests"
- Initiation of Bago Yoma Greening (reforestation) Project
- National economic policy for the controversial expansion of agriculture and fisheries
- Construction of dams and reservoirs

- Increased export of teak logs
- Release of controversial report on logging and natural resource exploitation by Global Witness (London), which was refuted by the government

New Zealand
- Purchase of significant forests (Central North Island Forest Partnership and Fletcher Challenge Forests) by US pension funds
- Dramatic increase in bulk shipping costs from New Zealand to East Asia and the Pacific (60 percent increase) reducing log prices, stumpage margins and profits for New Zealand forest owners
- Government announced policy on climate change, including a decision not to devolve forest-based carbon sink credits and their associated liabilities for the first commitment period, under the Kyoto Protocol
- The discovery and containment of new pest threats (the fall webworm, gum leaf skeletoniser, Asian gypsy moth) and the quarantining of pine pitch canker, as part of on-going surveillance for protecting New Zealand's forests from alien invasive species
- The UNFF intersessional meeting on "*The Role of Planted Forests in Sustainable Forest Management*", Wellington, (March)
- The loss of value of exported forest products as a result of the appreciation of the New Zealand dollar relative to the US dollar

Nepal
- Government policy to tax the surplus sales of *Shorea robusta* and *Acacia catechu* from community forests at 40 percent
- Government's continued policy to pilot collaborative forest management in the Terai region of Nepal, rather than expand the community forestry model
- Initiation of district-level multi-stakeholder forestry coordination committees in 11 Terai districts of Nepal - District Forest Coordination Committees
- Ongoing Maoist insurgency and political uncertainty

Papua New Guinea
- Jailing of the chairman of the National Forest Board for "contempt of court" for refusing to pay customary resource owners "timber royalties" for trees taken from customary land

Pakistan
- Institutional and legal reforms in the Forest Department
- Widespread and continuing death of one of the most valuable and extensively planted tree species in Pakistan, *Dalbergia sissoo.*

Philippines
- Revision of the Philippine Forestry Master Plan
- Development and testing of Environmental Users Fees (EUF), to transfer payments from lowland water users to upland communities for watershed management and rehabilitation
- A nationwide assessment of community-based forest management to move towards more effective implementation
- Burgeoning eco-tourism projects in many upland and mangrove areas, particularly those under community-based management
- Increasing role of barangay (smallest unit of government) in natural resource management
- Increasing conflict between indigenous cultural communities/indigenous peoples and the government, related to management of natural resources within ancestral domain areas, based on "national interest"
- Debate on the constitutionality of the ancillary rights of mining concessionaires over surface natural resources such as timber
- Suspension of resource use permits issued to community-based forest management agreement holders

Thailand
- Restructuring of the Royal Forest Department
- Increase in area of national parks
- Increasing role of tambon (smallest unit of government) in watershed management

Viet Nam

- Revision of the Land Law to provide legal recognition to communities in forest management
- Acknowledgement of the role of communes and districts in supporting community forest management

2. ***What was the most significant issue, development or event that occurred in the Asia-Pacific region in 2003 that had (or is likely to have) significant impact on forests or forestry?***

Responses:

- Asia Forest Partnership (launched at WSSD)
- Ongoing debate and encouragement towards good forest governance and tackling of corruption within the forestry sector
- Bali declaration on illegal logging
- Increasing (international) attention to the issue of illegal logging
- Negative impact of illegal logging on the timber market in East and Southeast Asia
- Increasing emphasis on the role of local communities in forest management
- Emergence of forest management based on an ecosystem approach to produce multiple forest goods and services simultaneously
- Development of national codes of practice for forest harvesting in the region
- China joining the World Trade Organization
- Continuing rise of China as a mega-importer of forest products
- Continuing constraints on the availability of financial resources for forestry resulting from the economic downturn of the late 1990s and early 2000s
- Clarification of forestry issues eligible for credits under the Clean Development Mechanism
- Desertification in Northeast Asian countries such as China and Mongolia, and the ensuing sandstorms
- Growing importance of decentralization and attention to building capacity of local government units (e.g. tambon, barangay, commune) for engaging in forest management
- Increased articulation of forest-water linkages
- Better understanding of cloud forests
- Greater focus on assisted natural regeneration
- Convening of the World Social Forum in Mumbai (January 2004), which highlighted forests and forestry and the impacts of forest degradation
- Increased availability of forest-related data in Asia
- Convening of the international conference on *"Eucalypts in Asia"* in Zhanjiang, China (April)
- Continuing decline in forest area and the failure of reforestation to match these losses
- Development of the ASEAN regional criteria and indicators and launching the Pan ASEAN timber certification initiative
- Slow pace of establishing firm programmes linking forestry and poverty alleviation
- Resurgence of the Thai economy and resulting strain on natural resources of the region
- Expanding adoption of joint forest management, in various forms, throughout the region
- Convening of the Asia-Pacific Forest Invasive Species conference in Kunming, China, and establishment of Asia-Pacific Forest Invasive Species Network

"Nature knows no pause in progress and development, and attaches her curse on all inaction.

-- Johann Wolfgang von Goethe --

FAO ASIA-PACIFIC FORESTRY CALENDAR

21-23 July 2004. Hangzhou, China. ***Regional Seminar on Forest Certification in China: Latest Developments and Future Strategies.*** Contact: Mr. Simmathiri Appanah, National Forest Programme Advisor (Asia Pacific), FAO Regional Office for Asia and the Pacific, Maliwan Mansion, 39 Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4136; Fax: (662) 697-4445; E-mail: simmathiri.appanah@fao.org

20-24 September 2004. Lin'an, China. ***Regional Workshop on Strategic and Operational Work Planning and Regional Model Forest Network Meeting for Enhancing Regional Networking Opportunities Between Model Forests.*** Contact: Mr. Brian Bonnell, Senior Program Officer, Asia, International Model Forest Network Secretariat, PO Box 8500, 250 Albert Street, Ottawa, Ontario K1G 3H9, Canada; Tel: 613-236-6163 ext 2114; Fax: 613-234-7457; E-mail: bbonnell@idrc.c

14-18 March 2005. Rome, Italy. ***17th Session of the Committee on Forestry.*** Contact: Doug Kneeland, Programme Coordinator, Programme Coordination Unit, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; Tel: 39-06-570-53925; E-mail: Douglas.Kneeland@fao.org

mid-2005. Kota Kinabalu, Sabah, Malaysia. ***Symposium on Tropical Rainforest Rehabilitation & Restoration – Existing Knowledge and Future Directions.*** Co-organized by: FAO RAP, World Wide Fund for Nature (WWF), Yayasan Sabah and the Sabah Forestry Department. Contact: Patrick Durst, Senior Forestry Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4139; Fax: (662) 697-4445; E-mail: Patrick.Durst@fao.org

FOREST NEWS is issued by the FAO Regional Office for Asia and the Pacific as part of TIGERPAPER. This issue of FOREST NEWS was compiled by Patrick B. Durst, Senior Forestry Officer, FAO/RAP.

A NEW RECORD ON HABITAT OF THE PROBOSCIS MONKEY (*Nasalis larvatus*) AND ITS PROBLEMS IN SOUTH KALIMANTAN, INDONESIA

by M. Arief Soendjoto

The proboscis monkey (*Nasalis larvatus*) is a large, sexually dimorphic, arboreal colobine that is endemic to Borneo island. In Indonesia, it is protected by the Act of Conservation of Biological Resources and Its Ecosystem (No.5/1990), the Agricultural Ministry Decree No.327/Kpts/Um/7/1972, and the Government Regulation No.7/1999. In South Kalimantan Province, the long-nosed primate was chosen as the provincial fauna mascot.

A New Record

The behavior of this primate has been intensively studied in some habitat types, such as mangrove, fresh water peat swamp and riverine forests, of either natural or protected areas (Jeffrey, 1979; Bismark, 1980; Salter & Aken, 1983; Salter *et al*., 1985; Bennett & Sebastian, 1988; Yeager, 1989; and Boonratana, 2000). However, in 2000-2003, in some sub-districts of South Kalimantan Province the author found that the proboscis monkeys live in three different habitat types. This could be a new record which is not known by many people.

In Marabahan sub-district (part of Barito Kuala district), this primate inhabits swamp forest dominated by galam *Melaleuca cajuputi.* In 8 out of 10 sub-districts of Tabalong district, it inhabits rubber (*Hevea brasiliensis*) forest or traditional rubber plantations. In Muara Uya, Haruai and Jaro sub-districts of Tabalong, it was found in limestone hill forests.

In galam swamp forest, the diet of the monkeys includes leaves of galam, piai (*Acrostichum aureum*), and kelakai (*Stenochlaena palustris*). In limestone hill forest this primate consumes the leaves and fruits of kariwaya (*Ficus* sp.). In rubber forest, it consumes the leaves and flowers of rubber (*Hevea brasiliensis*), cempedak (*Artocarpus integer*) and cempedak banyu (*A. teysmanii*), the leaves of alaban (*Vitex pubescens*), and fruits of tuu (a kind of rattan). According to the local community, the proboscis monkey has lived in these areas for more than 40 years and it frequently raids gardens for banana fruits.

Problems to be solved

The author identified four factors that threaten the sustainability of proboscis monkey, i.e. habitat conversion, habitat fragmentation, the presence of the monkey in non-protected (cultivated) areas, and poor treatment.

Conversion of the habitat occurs daily. This is not a problem if the process is to convert critical land to productive land. However, the local community also converts forest and natural land into places of human activity such as for resettlement, mining and industrial sites. These legally and illegally converted areas can range from 10 ha to thousands of ha., consequently reducing the appropriate habitat for the survival of proboscis monkeys.

Fragmentation of habitat often follows habitat conversion. It commonly occurs when roads are built to access isolated areas. For example, in Tapin district a new 52 km road was constructed to connect the highway of Banjarmasin (South Kalimantan) – Balikpapan (East Kalimantan) and the coal loading port of Sungai Putting. The 12 m wide road fragments the swamp forest. In Tabalong district, a new 2 km road was constructed to connect the highway of Tanjung (South Kalimantan) – Balikpapan and the road of Muara Uya – Simpung Layung. This 5 m wide road fragments the rubber forest.

Both the swamp forest and the rubber forest are two appropriate habitat types for the proboscis monkey, but because of the roads, the forests are broken up, which disturbs primate behavior. If populations are isolated, inbreeding may increase.

In general, rubber forests are categorized as cultivated areas and their owners are members of the community. The activities conducted in the forests are profit-oriented. Members of the community can convert the forests at will and consequently land functions change rapidly. Although protected animals concurrently inhabit the forests, maintaining their sustainability is likely to be of lesser priority.

The hunting and killing of monkeys is carried out for several reasons. Some farmers put out poison for the proboscis monkey because they consider it a pest that raids their crops. One community in South Kalimantan uses the monkey as a protein resource. Others kill the animals and use their body parts to trap lizards and snakes that have a high market value, or to feed to caged crocodiles. The flesh costs about Rp4.000 per kg.

References

Bennett, E.L. and A.C. Sebastian. 1988. **Social organization and ecology of proboscis monkeys (Nasalis larvatus) in mixed coastal forest in Sarawak**. *Int. J. Prim*. 9(3):233-255.

Bismark, M. 1980. **Behavior and population density of proboscis monkey (Nasalis larvatus) at Tanjung Putting Game Reserve, Central Kalimantan.** Report No.357, Forest Research Institute of Agricultural Dept., Bogor, Indonesia. (in Indonesian with English summary)

Boonratana, R. 2000. **A short note on vigilance exhibited by proboscis monkey (*Nasalis larvatus*) in the Lower Kinabatangan, Sabah, Malaysia**. *Tigerpaper* 27(4):21-22. FAO Regional Office for Asia and the Pacific, Bangkok.

Jeffrey, S.M. 1979. **The proboscis monkey, some preliminary observations**. *Tigerpaper* 6(1):5-6. FAO Regional Office for Asia and the Pacific, Bangkok.

Salter, R.E. and K.N. Aken. 1983. **The proboscis monkey in Bako National Park, Sarawak**. *Tigerpaper* 10(3):6-8. FAO Regional Office for Asia and the Pacific, Bangkok.

Salter, R.E., MacKenzie, N.A., Nightingale, N., Aken, K.M. and P.K. Chai. 1985. **Habitat uses, ranging behaviour and food habitats of the proboscis monkey, *Nasalis larvatus* (van Wurmb), in Sarawak**. *Primates* 26(4):436-451.

Yeager, C.P.1989. **Feeding ecology of the proboscis monkey (*Nasalis larvatus*).** *Int. J. Prim.* 10(6):497-530.

The author is a Doctoral Candidate at Program Pascasarjana, Bogor Agricultural University. His address is: Jl. Cendana II D No.84 A RT 44 Kayutangi, Banjarmasin 70123, Indonesia.

VANISHING WETLANDS OF KERALA, INDIA

by Manjula Menon

Wetlands are ecosystems with specific ecological characteristics, functions and values. They are among the most productive ecosystems of the world and are essential life-supporting systems providing a wide array of benefits to human kind. It is not surprising that the first signs of civilization have been traced to wetland areas. Once wetlands were considered useless and waterlogged unproductive areas, and sometimes as deleterious ecosystems. Today, opinions have changed about the value of wetlands; but unfortunately, these ecosystems are rapidly declining and deteriorating in various parts of the world, including India.

Wetlands are famous the world over as waterfowl habitats and cover 6.4% of the earth's area. India has about 4.1 million ha of wetlands, of which 1.5 million ha are natural and 2.6 million ha are man-made (Ministry of Environment and Forest, Government of India, 1990). Their high productivity places wetlands among the richest and most biologically diverse ecosystems in the world. Most of the wetlands in India are host to rare, threatened and endangered species of flora and fauna. Many species of wetland flora and fauna show extreme sensitivity to any deterioration in the quality of their environment. These can act as early warning systems, indicating the failing health of their habitats. Dragonflies and other odonates are extremely sensitive to polluted environments and show a visible decline as a result of habitat degradation. Among the avifauna, the Indian skimmer is extremely sensitive to contaminated waters, and its disappearance is a sure sign of surface water pollution. One of the most valuable functions of wetlands is the cleansing and detoxification of polluted waters. Wetland plants are very efficient in removing nutrients from polluted waters, thus minimizing eutrophication of the aquatic habitat. Wetlands have proved to be inexpensive alternatives to conventional sewage treatment plants.

The need for wetland protection was given serious consideration at the global level in the early 1960s. A series of conferences and technical meetings, held mainly under the auspices of the International Waterfowl and Wetland Research Bureau (IWRB), U.K., culminated in the Convention on Wetlands of International Importance, especially as water fowl habitat. Better known as the Ramsar Convention, this inter-governmental treaty was signed in Ramsar, Iran in 1971 and provides the framework for international cooperation for the conservation of wetland habitats.

India acceded to the convention in October 1981, and designated Chilka Lake (Orissa) and Keoladeo Ghana National Park (Rajasthan) as Ramsar Sites. Four additional sites were designated in March 1990: Wular Lake (Kashmir), Harike Lake (Punjab), Loktak Lake (Manipur), and Sambhar Lake (Rajasthan). Wetlands are designated in this convention based on international significance in terms of ecology, botany, zoology, limnology or hydrology. Millions of birds representing 318 species, including a large number of migratory birds, are believed to be associated with Indian wetlands and about 101 species (Nameer, 1996) are reported from the wetlands of Kerala. The Kole wetlands, spread over an area of 11,000 ha in Thrissur and Malappuram districts and Vembanad Lake, harbor about 85% of the birds and provide habitat for globally threatened species. These important wetlands are under great threat due to various land use practices, and the findings of a study conducted in the area put forth the recommendation that the Kole lands of Thrissur be declared a protected area. The uncontrolled urban development in the backwaters of Kerala have also added to the plight of the wetlands. The same is true in the case of Mangalavanam wetland in Kochi, which has become the dumping ground of many industries. Periyar Lake has become almost toxic due to the waste discharged by

adjoining factories and now cannot be used for drinking water by the nearby villages. The wetlands in Malapuram face similar problems. Azhinhillam wetland has been degraded due to the spread of various exotic weeds. This illustrates the plight of large wetlands in Kerala, but can we ignore the smaller ones that have immense diversity and can be lost without notice?

The state of Kerala was once home to a large number of small wetlands that added to the immense diversity found in these habitats. But today, these small wetlands have almost disappeared and there is an urgent need for the rehabilitation of these water bodies before there is a drastic decline in the ground water resources.

A study conducted by Semlitsch and Brodie (1998) concluded that the majority of natural wetlands are small but rich in amphibian species, serving as an important source of juvenile recruits. Small wetlands are valuable for maintaining biodiversity and their loss causes a direct reduction in the linkages between the remaining species populations. The existing and also the recently proposed legislation are inadequate for maintaining the biodiversity of the flora and fauna. The size of the area is not the important factor; the number of individual wetlands is more important for their abundance and distribution.

Amphibians constitute the greatest biomass among the vertebrates in many ecosystems (Burton and Likens, 1975) and are of global concern due to reported declines and extinctions in their populations (Wake and Morowitz, 1991; Blaustein *et al*., 1994; Pounds and Crump, 1994). Large wetlands tend to be more permanent and thus contain predatory fish, and perhaps a greater variety or abundance of them prey on invertebrates (Morin, 1983; Wilbur, 1987; Semlitsch *et al.*, 1996). Small wetlands may be of significant biological importance, especially in producing a greater number of metamorphosizing juvenile amphibians and potentially in maintaining the diversity of the regional amphibian fauna. Such wetlands are also of general importance because they harbor a large number of species of other taxa that are perhaps less mobile than birds or mammals, and therefore are more strongly affected by the loss of small wetlands. These include wetland plants such as sundews (*Drosera* spp.) and pitcher plants (Sharitz and Gibbons, 1982); microcrustaceans (Mahoney *et al.*, 1989); and aquatic insects (Kondratieff and Pyott, 1987; Sharitz and Gibbons, 1982; Gaddy, 1994).

In Kerala, vast areas of wetlands have been taken over by agricultural practices. Many hectares of wetlands have already been reclaimed for rice cultivation and the conversion process continues. Direct human intervention has totally obliterated some wetlands by drainage and reclamation for agriculture, paddy cultivation, fishing, collection of reeds and other economically important plants, and urban construction. The mining of wetland soils for peat, the construction of dams, levees and dykes for flood control, and pesticide and sewage discharge also add to wetland loss and degradation. Other threats include increased sedimentation due to dam construction, damaging land use practices in the catchments, and land subsidence due to the excessive extraction of ground water, oil and gas. Added to these are the natural causes such as eutrophification, erosion, storm damage, drought or biotic interference (other than by man) that have led to the destruction of wetlands.

Wetlands are dynamic and an understanding of the varied communities supported by wetlands and how they are affected is a prerequisite to managing them. Complexes of small, seasonal and semi-permanent wetlands must be preserved in order to avoid drastic declines in populations of flora and fauna. They are also important in maintaining the food web of the biotype. Kadlec and Kadlec (1978) suggested in their review of wetlands and water quality that every water quality parameter can be altered by passage through a wetland ecosystem. The concentration of nutrients (various forms of nitrogen, phosphorous, potassium and micronutrients), heavy metals, pesticides and other chemical constituents, organic matter, man-made chemicals, dissolved oxygen and other suspended solids, bacteria and other pathogens can all be affected. Wetlands appear to perform all of the biochemical transformations of waste water constituents that take place in conventional wastewater treatment plants, in septic tanks and their drainage fields, and in other forms of land treatment (Brinson and Westall, 1993).

Burning or grazing, or a combination of the two, will be required to maintain wetlands in the best condition for most bird species. There are many instances where these forces seemed to benefit the productivity of prairie wetlands and increase their use by breeding and migrant birds. The benefits are due to the decrease in the extent of monotypic stands of emergent vegetation and the creation of openings that allow greater biological productivity within shallow water zones and allowing the free movement of birds.

Unfortunately, the current trend is clearing almost all the available wetlands in Kerala, which will have an adverse impact on the avifauna that inhabits them. Appropriate conservation strategies should be implemented to preserve this natural heritage. But whatever strategy is put into action must have the support of the local population if it is to succeed. Awareness of the importance of these delicate ecosystems must be developed among the people. The wetlands still remain unprotected and a holistic approach is needed for the conservation of this ecosystem.

References

Anonymous. 1992. **India's wetlands, mangroves and coral reefs.** WWF, for the Ministry of Environment and Forests, Government of India.

Blaustein, A.R., Wake, D.B. and W.P. Sousa. 1971. **Amphibian declines: judging stability, persistence and susceptibility of populations to local and global extinctions.** *Conservation Biology* 8:60-71

Brinson, M.M. and F.R. Westall. 1983. **Application of waste water to wetlands.** RPT.No.5, Water Research Inst., University of North Carolina, Raleigh, N.C. 26 pp.

Burton, T.M. and G.E. Likens. 1975. **Salamander populations and biomass in the Hubbard Brook Experimental Forest, New Hampshire.** *Copeia* 1975:541-546.

Gaddy, L.L. 1994. **The ecology of seven rare wetland species in Carolina bays and bay-like depressions in the western coastal plain of South Carolina.** Report of the U.S. Forest Service, Savannah River Forest Station. Aiken, South Carolina.

Kadlec, R.H. and JA. Kadlec. 1978. **Wetlands and water quality (theme paper).** In: P.E. Greeson, J.R. Clark and J.E. Clark (Eds.) *Wetland functions and values: The state of our understanding.* AWWA, Minneapolis, MN. p.436-56.

Kondratieff, B.C. and C.J. Pyott. 1987. **The anisoptera of the Savannah River Plant, South Carolina, U.S.A., thirty years later.** *Odonatologica* 16:9-24.

Mahoney, D.L., Mort, D.A. and B.E. Taylor. 1989. **Species richness of calanoid copepods, cladocerans and other branchiopods in Carolina Bay temporary ponds.** *American Midland Naturalist* 123:244-258.

Morin, P.J. 1983. **Predation, competition and the composition of larval anuran guilds.** *Ecological Monograph* 53:119-138.

Nameer, P.O. 1996. **An overview of the wetlands of Kerala and their conservation.** Proceedings of the Salim Ali Centenary Seminar.

Pounds, J.A. and M.L. Crump. 1994. **Amphibian declines and climate disturbance: the case of the golden toad and harlequin frog.** *Conservation Biology* 8:72-85.Semlitsch, R.D. 2000. **Size does not matter. The value of small isolated wetlands**. *The National Wetlands Newsletter.*

Semlitsch, R.D. and J.R. Brodie. 1998. **Are small isolated wetlands expendable?** *Conservation Biology* 21(5):1129-1133.

Semlitsch, R.D., Scott, D.E., Pechmann, J.H.K. and J.W. Gibbons. 1996. **Structure and dynamics of an amphibian community: evidence from a 16-year study of a natural pond.** In: M.L. Cody and J.A.

Smallwood (Eds.) *Long -term studies of vertebrate communities.* Academic Press, San Diego, California.

Sharitz, R.R. and J.W. Gibbons. 1982. **The ecology of southeastern shrub bogs (pocosins) and Carolina bays: a community profile.** FWS/OBS-82/04. U.S. Fish and Wildlife Service, Washington, D.C.

Wake, D.B. and H.J. Morowitz. 1991. **Declining amphibian populations: a global phenomenon?** *Alytes* 9P33-42.

Wilbur, H.M. 1987. **Regulation of structure in complex systems: experimental temporary pond communities.** *Ecology* 68:1437-1452.

Author's address: c/o C. Muraleedharan, AE, E/M, c/o GE (I), R and D (East), C.V. Raman Nagar, Bangalore-93, Bangalore, India; E-mail: manjumenoncama@yahoo.co.in

WILDLIFE POTENTIAL IN RAWALPINDI DISTRICT, PUNJAB, PAKISTAN

by M. Anwar Maan, A. Aleem Chaudhry, Muhammad Sajid Nadeem and Agha Ezaz Ibrahim

Introduction

The mountainous tract in Rawalpindi district is a diversified habitat for important wildlife species. The mountainous tract supports dry sub-tropical forests dominated by *Olea ferruginea, Acacia modesta, Carissa opaca* and *Dodonaea viscose.* The vegetation extends up to temperate coniferous forests through sub-tropical chi pine forests having an understory composed of *Berberis lyceum, Rosa moschata* and *Carissa opaca.*

The study was carried out with the following objectives: 1) to conduct surveys for wildlife potential in Rawalpindi district; 2) to monitor the population status of species; 3) to determine habitat preference and the distribution pattern of species; 4) to conduct socio-economic surveys to identify incentives for active involvement of local community in management activities; 5) determine the overall diversity of wildlife species; 6) raise the awareness of the local community about the importance of wildlife; and make recommendations in the form of management plans.

No work has been carried out in Pakistan regarding the density, habitat preference and distribution patterns of species. Roberts (1991) described biology, general status and distribution range of mammals and birds in Pakistan. However, density, habitat preference and distribution patterns have not been documented. The present study was of a preliminary nature and designed to describe density per km^2, habitat preference and distribution patterns in 11 important wildlife species and participation of local community for sustainable use of natural resources.

Materials and methods

The habitat was surveyed to determine the populations of important wildlife species following the strip census method (Tanner, 1978). The habitat preferences of 11 species were determined by Chi square method (Davis and Goldsmith, 1984). In all, 74 transects (4 km long and 100 m wide) were studied over a total area of 300 km^2. Animals and birds flushed during the survey were noted. Indirect clues such as calls, droppings, scratches on the ground and roosting sites were searched out. Socio-economic surveys were conducted according to a pre-designed format for interviewing the public and the staff of the Wildlife and Forest Departments. Identification of species followed Roberts' method (1991). Data was analyzed following standard statistics (Davis and Goldsmith, 1984).

Distribution patterns were determined according to Odum (1971). The value of the Dispersion Index (D.I)<100, indicated a group-forming trend and the concentration of species in patches of habitat. A value of D.I=100 indicates a random distribution of species and D.I>100 indicates uniform distribution in a species.

Results

The results of the study are summarized in Tables 1 and 2.

Table 1: Density (per km^2) and estimated population of some important wildlife species

Common Names	Scientific Names	Density per km^2	Estimated population
Kaleej pheasant	*Lophura leucomelana hamiltoni*	0.905±0.112	237-305
Black partridge	*Fracolinus francolinus*	0.827±0.106	216-279
Goshawk	*Accipiter gentiles*	0.028±0.019	2-14
Barking deer	*Muntiacus muntjac*	0.246±0.058	56-91
Yellow-throated marten	*Martes flavigula*	0.060±0.030	9-27
Rhesus monkey	*Macaca mulatto*	0.386±0.073	93-137
Flying squirrel	*Eupetaurus cinereus*	0.028±0.019	2-14
Jackal	*Canis aureus*	0.156±0.046	33-60
Fox	*Vulpes vulpes*	0.025±0.018	2-12
Common leopard	*Panthera pardus*	0.018±0.016	1-10
Porcupine	*Hystrix indica*	0.160±0.047	33-62

Note: Nine chicks of Kaleej pheasant (4 females) were also observed during the study period.

The 11 species observed were studied for their habitat preference, following chi^2 statistics. Non-significant value of chi^2 at n-l d. f. and 95% C.I indicated that species were less determined in habitat selection and were widely distributed throughout the habitat range. This factor highlights the adaptability of these species to different sets of ecological conditions, ranging from *Olea phulai* scrub to temperate coniferous forest.

Table 2: Habitat preference and distribution of important wildlife species

Species	$?^2$	Dispersion Index
Kaleej pheasant	4.440	31.40 (Aggregated)
Black partridge	4.440	16.23 (Aggregated)
Goshawk	0.224	180.00 (Uniform)
Barking deer	12.639	16.41 (Aggregated)
Yellow throated marten	2.982	62.85 (Aggregated)
Rhesus monkey	4.462	652.00 (Uniform)
Flying squirrel	0.224	81.82 (Aggregated)
Jackal	4.490	79.36 (Aggregated)
Fox	4.510	160.00 (Uniform)
Common leopard	6.760	100.00 (Random)
Porcupine	4.840	135.00 (Uniform)

Non-significant values of $?^2$ indicated that species are less determined in habitat selection. The Dispersion Index indicated that only the leopard had random distribution, while other species have aggregated and uniform patterns of distribution within the habitat range.

The population distribution is an important biological parameter from the management point of view. It reflects the flow of population from breeding sites into habitat and likewise management activities for different species will be based on the distribution pattern of the species.

Discussion

Eleven species were observed during the survey. Barking deer was recorded in four areas with a density of =1.0 per km^2. Similarly, in four areas, the density per km^2 of Kaleej pheasant was =1.0 and in other areas the density was =1.0. Among most of the species, the density was less than one bird/animal per km^2. However, the per km^2 density of Black partridge was encouraging, indicating that more than two birds per km^2 survive in some patches of habitat. It was observed that in some areas, there was good potential for the survival of wildlife species, but in most of the areas the estimates were not encouraging. According to Roberts (1991), habitat exploitation was the major factor affecting the populations of important wildlife species in the area. In the present study, the estimated populations of the 11 species in the available habitat of 300 km^2 were also low from the sustainable utilization aspect.

Sixty-two people were interviewed in two socio-economic surveys (32 in the first survey and 30 in the second). The respondents were categorized as follows: students (6.6%); civil servants (18.3%); businessmen (23.3%); farmers (26.6%); and laborers (25.2%). According to the responses, 66.7% raised cows, goats and buffaloes; 13.3% had only poultry birds; and 20% had no livestock at all. 66.6% grazed their livestock in the forest area; 29.6% had the animals graze in their own land; and 3.8% did not reply to the question. 73.3% of those surveyed said that they cut wood from the forest for domestic use; 8% claimed that there is a ban on wood cutting; and 18.7% claimed that they were not involved in any illegal activities. All of the local people interviewed were aware of the types of wildlife in the area.

Regarding hunting, 53.6% were of the view that hunting is limited; 43.4% said no hunting; and 3% practiced unlimited hunting. 33.6% did not indicate any specific species for hunting; 43% indicated mixed hunting. 43.4% stated that the hunters were local people; 6.6% blamed outsider hunters. 43.5% believed that the hunters used guns; 3% said nets; 3.5% claimed gun-net hunting; and 50% did not know.

14.7% stated that hunting is practiced in groups while 30% believed it was single hunters. 93.3% of those surveyed believed that there is no control on hunting by the Wildlife Department.

90% of the people surveyed were willing to cooperate in wildlife conservation measures; 31.5% recommended a complete ban on hunting and 40% recommended protection from fire during the burning season. 15.5% wanted protection by the Wildlife Department and 13% recommended arrangements to supply artificial feed for wildlife species.

Recommendations

- Foster awareness and active involvement of the community in conservation efforts
- Fix criteria for commercial hunting
- Promote revenue generation through commercial hunting
- Improve the welfare of the community through the proceeds of commercial hunting
- Recognize wildlife as an important natural resource that benefits the community
- Use public awareness to protect livestock from leopard predation
- Put strict controls on habitat degradation
- Put strict controls on hunting, particularly in the breeding season
- Discourage commercialization in the community in order to protect the habitat
- Strict enforcement of the Wildlife and Forest Acts.

References

Davis, L.O. and P.L. Goldsmith. 1984. **Statistical Methods in Research and Production.** 4th Ed. Longman, London and New York.

Odum, E.P. 1971. **Fundamental of Ecology**. W.B. Saunders, Philadelphia. 574 pp.

Roberts, T.J. 1991. **The Mammals of Pakistan**. Oxford University Press.

Roberts, T.J. 1991. **The Birds of Pakistan. Vol.1 & Vol.2,** Oxford University Press.

Tanner, J.T. 1978. **Guide to the Study of Animal Populations**. University of Tennessee Press, Knoxville.

Authors' addresses: M. Anwar Maan, A. Aleem Chaudhry and Agha Ezaz Ibrahim, c/o Punjab Wildlife Department, 2-Sandaha Road, Lahore, Pakistan; Muhammad Sajid Nadeem, c/o Zoology Department, New Campus Punjab University, Lahore, Pakistan.

POPULATION ESTIMATES OF FALCONS IN SINDH

by Haroon Rashid, Muhammad Saeed Akhtar and Aleem Chaudhry

Introduction

Falcons are birds of prey which are distributed throughout the world and found on every continent (Cramp and Simmons, 1983). A number of species found in Pakistan are largely resident and breed throughout the mountain tracts, with some winter migration to the plains and semi-desert areas in Punjab, Sindh, Balochistan and NWFP (Ali and Ripley, 1968-72). A number of species migrate to Pakistan in winter from Central Asia and China (Nawaz, 1987).

Some species, such as Saker Falcon and Peregrine Falcon are most popular with falconers for hunting Houbara bustards due to their size, speed, stamina and they are easier to train (Roger, 1995). Large-scale trapping of these species is rapidly decreasing their population over their entire range (Nawaz, 1988). With regard to the status of falcons in Sindh, it was largely unknown how many species visited or were captured by trappers annually.

Materials and methods

Population density

During the survey, slow-moving vehicles were used to traverse the habitats visited by falcons, scanning 200 to 300 m of the surrounding areas with binoculars. Once a team member spotted the bird, coordinates of the particular location were recorded. In another method, three persons were dropped off at a 3 km distance. Each person traveled 1 km by foot, scanning both sides with binoculars. Thus, in a single sample, 9-12 km^2 could be explored. The statistical regression used to determine the density of the species was as follows:

$Y = a+bx$

Where $a = y-bx$

And $$b + \frac{n.\Sigma xy-\Sigma x.\Sigma y}{n.\Sigma x^2 - (\Sigma x)^2}$$

x = In (area scanned) (Following the method in "Statistics for Ornithologist" by Jim Fowler and Louis Cohen.)

Trapping of falcons

The trappers encountered during the survey were interviewed regarding falcon trapping activities.

Results

The estimated number of species is a number whose natural logarithm is 2.89 (i.e. antilog 2.89), namely 18. Therefore, it could be concluded that 18 falcons belonging to 8 falcon species were present in 500 km^2 of the habitat visited by the species in Sindh.

Table 1: Estimated number of falcon species in Sindh

Study Areas	Area Scanned (km^2)	In (area)	No. of Falcons Seen	In (falcons)
Thatta	300	5.7	32	3.46
Thar	1000	6.9	193	5.29
Dadu	500	6.21	6	1.79
Larkana	200	5.29	2	0.69
Shikarpur	250	5.52	3	1.09
Jacobabad	300	5.7	5	1.6
Kishmor	300	5.7	7	1.94
Sukkur	200	5.29	6	1.79

Khairpur	250	5.52	11	2.39
Noshero Feroz	50	3.9	2	0.69
Nawab Shah	300	5.7	7	1.94
Total	3650	61.43	274	22.64

a = 5.417; b = 1.433; Y = a + bx; Y = 5.417 + (1.33 x In 500) = 2.89

Table 2: Summary of different falcon species observed in different areas of Sindh in 1999

Study Areas	Falcon Species								
	Saker	**Peregrine**	**Kestral**	**Merlin**	**Laggar**	**Hobby**	**Sooty**	**Barbary**	**Total**
Thatta	-	19	6	3	-	2	1	1	32
Thar	3	2	31	35	120	-	2	-	193
Dadu	-	2	1	1	1	1	-	-	6
Larkana	1	1	-	-	-	-	-	-	2
Shikarpur	-	3	-	-	-	-	-	-	3
Jacobabad	2	3	-	-	-	-	-	-	5
Kishmor	1	6	-	-	-	-	-	-	7
Sukkur	-	4	2	-	-	-	-	-	6
Khairpur	8	3	-	-	-	-	-	-	11
Noshero Feroz	-	2	-	-	-	-	-	-	2
Nawab Shah	1	6	-	-	-	-	-	-	7
Total	16	51	40	39	121	3	3	1	274

Trapping of falcons

Three different methods were used by the trappers. Two of them involved setting traps with a pigeon staked out as a lure tied to a nail in the center.

Method 1: A number of tall sticks were driven into the ground around the pigeon. The tall sticks supported a net may of thin nylon threads. As soon as the Peregrine Falcon swoops down to take the pigeon, it is caught in the net.

Method 2: A V-shaped trap was set up almost like a cricket practice net. This type of trap was also efficient in entangling a swooping falcon. In this case, a black pigeon was used with a red ribbon tied to its leg. This gives the appearance of an injured pigeon that increases the interest of the Peregrine Falcon.

Method 3: This procedure was used in Nagarparkar to capture Peregrine and Saker Falcons. After stitching closed the eyes of a Laggar Falcon, a ball made of feathers is tied to the Laggar's feet to be used as a decoy. As soon as a Peregrine or Saker Falcon comes into sight, the Laggar is released into the air. Because of its restricted vision, it flies in circles with the ball of feathers attached to its claws. The Saker/Peregrine Falcons try to snatch the decoy from the Laggar Falcon and in this way gets entrapped. With the feet entangled, both birds are unable to fly and fall to the ground where the trapper captures the prize.

Discussion

It was generally observed that there was a very low population of falcons in Sindh. There are 290 falcon species distributed throughout the world except in Antarctica. Among these, 52 species are found in Pakistan. However, only 8 species were recorded during the survey, i.e. Laggar (121), Peregrine (51), Kestrel (40), Merlin (39), Saker (16), Hobby (3), Sooty (3) and Barbary (1).

Trapped Sarker Falcon

Trapped Peregrine Falcon

The overall population of falcon species distributed in Sindh (3,650 km^2) was found to be 18 birds/500 km^2. The population density of Peregrine and Saker Falcons was 0.01 birds/km^2 and 0.004 birds/km^2 respectively. The major reason of the decline of these two species is due to falconry (Roger, 1995). It was observed that there were a number of trappers in Sindh, most of them carrying valid Falcon Trapping Licenses (FTLs). According to Dawn, Karachi (21-Sep. 2000), the Sindh Wildlife Department (SWD) issued 9 FTS and one dealership permit. The next year, there was a 100% increase in FTLs, i.e. 18, and 5 dealership permits were issued (26-Nov. 2001, Dawn, Karachi). The present density of Peregrine and Saker Falcons signals that there should be an immediate and absolute 5-year ban imposed on their trapping in Sindh.

Trappers interviewed during the survey revealed that there were a good number of Saker/Peregrine Falcons in Sindh over the last 30 years, but their numbers have now greatly declined. They attribute this to illegal trapping, lack of awareness among the local people sharing the falcon habitat, and lack of communication between conservationists and trappers for the management and future survival of the species.

The author considers the decline to be due to the following factors:

- lack of facilities, particularly means of communication and transportation available to the wildlife staff in the region, which is undergoing massive illegal trapping in the remote areas;
- increased use of insecticides/pesticides in agricultural lands, which have harmful effects when eaten, affecting small birds, rodents and insects;
- extensive cultivation and urbanization which has destroyed the falcon habitat;
- lack of a scientific approach and unanswered questions about the origins of wintering birds and the methodology to be adopted to study the population differentiation of falcons wintering in Pakistan; and
- lack of a Falcon Rehabilitation Center in Pakistan, which could reduce the number of falcons that die each year.

Acknowledgments

The authors are grateful to the Falcon Foundation International Pakistan (FLIP) for their generous funding, without which the study could not have been carried out. Special thanks to Brig Mukhtar Ahmad, President, FLIP for his extraordinary cooperation. We would also like to thank Hussain Bux Bhaaget, Deputy Conservator Sindh Wildlife Department, (ZWD) Sukkur; Ghulam Rasool Channa, Deputy Conservator Hyderabad; Ahmad Hussain Nizamani, Assistant Conservator ZWD Badin; Lajpat Sharma, Game Officer (ZWD) Mithi, Ghulam Mohammad Gaddani, Game Officer (ZWD) Mirpur Mathelo; and Riaz Ahmad, District Forest Officer, Thatta for a variety of assistance in the field.

References

Ali, S. and S.D. Ripley. 1968-72. **Handbook of birds of India and Pakistan. Vol.2.** Oxford University Press.

Cramp, S. and K. Simmons. 1983. **A hand book of the birds of Europe, the Middle East and North Africa. The birds of the Western Paleartic. Vol.II.** Oxford University Press, Oxford.

James, H.E., William, H., Lloyd, K. and M. Clayton. 1995. **Population changes in North American Peregrines.** Trans. 60th No. Am. Wildlife. and Natural Resource Conference 1995. (p.142-158).

Kenward, R.E., Pfeffer, R.H., Bragin, E.A., Levin, A. and A.F. Kovshar. 1995. **The status of Saker falcon in Khazakhstan.** Proceedings of the specialist workshop. Abu Dhabi, United Arab Emerites, 14th-16th November 1995. (p.131-138).

Nawaz, M. 1987. **Status and distribution of Falcons (Falconidae) in Pakistan.** *Tigerpaper* 14(3):18-20.

Nawaz, M. 1988. **Falcon Trapping – its decline in the province of Balochistan, Pakistan.** *Tigerpaper* 15(1):31-32.

Roger, U. 1995. **Arab classification of shaker falcon.** Proceedings of specialist workshop, Abu Dhabi, United Arab Emirates, 14th-16th November 1995 (p.114-116).

REVIVAL OF TIGER POPULATION BY STRINGENT HABITAT PROTECTION: A CASE STUDY FROM ORISSA

by S.K. Chadha

Introduction

The last tiger disappeared from the Berbera forests in the 1970s. It was never imagined that this animal would set foot again in this beautiful, undulating landscape in the catchment of the world-famous Chilka Lake in the eastern state of Orissa, India. There was at time when permits were issued to kill tigers in the area, until reckless persecution pushed the species to the state of local extinction. Things started to change after the promulgation of the Indian Wildlife Act, 1972, which listed the tiger in Schedule I, prohibiting its killing in the wild. Gradually, the enforcement agencies shifted from the colonial mindset of 'shikar', but not much changed for the tigers in Berbera.

The habitat came under intense biotic pressure after 1975 when urbanization started in nearby towns in Bhubaneshwar and Cuttack. Organized timber gangs operated without fear of reprisal, leading to large-scale degradation of the habitat. Steps were taken by the State Government for the protection of this habitat and the area has shown a lot of resilience, and so has the tiger by appearing again – 25 years after the last sighting.

Land, vegetation and prey base

The Berbera forests of Khurda Forest Division in Orissa are one of the richest wildlife areas in eastern India. It is a stretch of about 350 km^2 of mixed deciduous forests with pockets of semi-evergreen forests spread throughout the area. There is a rich assemblage of ungulate species and three large predatory carnivores, i.e. tiger, leopard and dhole.

Forest types

The forests are categorized into the following types, as per Champion and Seth:

I. Sub Group 2 B – Northern Tropical Semi-evergreen Forests
   - 2B/c3 – Orissa Semi-evergreen Forest
II. Sub-Group C – Northern India Tropical Moist Deciduous Forests
   - 3C/Cl(d) – Peninsular (Coastal) Sal Forests
   - 3C/2SL – Northern Secondary Moist Mixed Deciduous Forest
III. Sub Group 5B – Northern Tropical Dry Deciduous Forests
   - 5B/C1 Co-Dry Peninsular Sal Forests

Dominant flora and fauna

Flora: There is a wide variety of flora, ranging from orchids to *Gnetumula*. Some important tree species found in the forest are: *Shorea robusta, Terminalia* sp., *Pterocarpus marsupium, Anogeissus latifolia, Adina cardifolia, Michelia champaca, Scheleichera oleosa, Mangifera indica, Bombax ceiba, Syzygium cumuni, Boswellia serrata, Dalbergia latifolia, Strychnos nuxivomica, S. potatorum, Xylia xylocarpa and Bridelia retusa*. Three species of canes present in the area are *Calamus viminalis, C. guruba and C. latifolius.*

Fauna: There are more than 35 major mammal species, about 150 species of birds, and some 30 species of reptiles reported from the area. Important mammal species include: tiger (*Panthera tigris*), leopard (*P. pardus*), elephant (*Elephas maximus*) (seasonal), sambar (*Cervus unicolor*), barking deer (*Muntiacus munjtak*), bison (*Bos gaurus*), wild boar (*Sus scrofa*), giant squirrel (*Ratufa indica*), jungle cat (*Felis chaus*), common langur (*Presbytis entellus*), among others.

Management history

The scientific management of these forests was initiated by the British during the late 1870s. The forests were demarcated and notified as government-owned reserved forests. The Forest Department concentrated on

replacing the natural mixed vegetation with teak on the foothills. Teak was introduced from Burma on the foothills of Rajin, Tamna, Bankad, Katual and Mal forests. The planting of teak plantations continued even after independence in 1947. There was no implementation of wildlife protection laws and the intensity of hunting increased. During interviews the local tribal population recalled that the population of animals declined even after the promulgation of the Wildlife Protection Act, and continued until the late 1980s. The infrastructure of the Forest Department was not equal to the task of combating the organized onslaught on the forest by the timber interests.

Significant management interventions

Due to the manifold increase in biotic pressure in the past three decades, the area suffered degradation. The situation became more precarious due to the acute shortage of trained manpower in the field, and the lack of a sufficient enforcement infrastructure. Some important management interventions have been carried out in the past decade and the results have started to become apparent. These interventions include the following:

a) Strengthening of enforcement

This is the only forest area in the country where the Central Reserved Police Force (CRPF) has been deployed on a long-term basis. The CRPF is a paramilitary force that volunteered to adopt these troubled forests. One company has been deployed since 1994, with headquarters at Berbera and outposts at Dhunanali, Baguda and Bhatpada. The CRPF jawans (forest guards) protect these forests together with the staff of the Forest Department and have even braved extreme malaria conditions in order to protect the forests and wildlife. The jawans patrol sensitive areas on foot along with Forest Department staff and often carry out ambushes and search-and-raid operations. Local tribals are motivated and provided employment throughout the year to ensure the support of the populace in conservation efforts. The achievements have restored the sagging morale of the forest department staff and have made this patch the most protected forest area in the country, even though it is not notified as a wildlife sanctuary or national park.

b) Fire control

Fire has been a major cause of worry for the wildlife habitat. Concerted efforts have been made by the Forest Department for the last five years to prevent fires in the core areas of Rajin, Tamna, Bankad and Mal forests. This has been done through motivation and the active involvement of the villagers, staff and tribals using these forests for transit from Nayagarh District. Fire lines have been maintained in these forests and there have been no major fires in the area since they were put in place.

c) Improvement of the water regime

There is an acute shortage of water during the summer and the streams of the Salia River dry up during the peak summer season. Only a few waterholes remain and the wild animals concentrate in these areas. More waterholes have been dug in Rajin and Tamna forests to provide water for the animals during summer, and the presence of a significant number of animals has been noticed. A permanent water hole has been created at Mahulia and one near Rajin forest camp has been renovated.

d) Communication and patrol camps

A communication network in the form of improved roads has been created and remote places like Rajin, Mahulia, Mahisagotha, Betuli and Sankhajodi can now be reached even during the rainy season. Patrol camps have been established at these remote areas with a permanent detachment of forest personnel and deployment of CRPF jawans. All these posts are connected through a modern VHF network and the mobile parties and foot patrols are provided with VHF sets. CRPF jawans have been provided with vehicles, motorcycles and bicycles for better enforcement capability. Thus, areas otherwise remote and difficult to communicate with can now be contacted in minutes.

Impact on animal populations

One of the significant impacts of the management policies and stringent enforcement of regulations concerning the

habitat is that there are now more frequent sightings of animals. Encounters with leopards, packs of dholes and large herds of ungulates are not uncommon anymore, except in the teak plantations, where sightings remain only occasional.

The ungulate population varies according their location. The forests close to well protected camps contain higher populations due to better protection. The moist patches near Rajin, Mahisagotha, Mahulia and Betuli have higher biomass densities of ungulates (e.g. gaur, sambar, wild boar) compared to drier patches. The population density is about 7,600 kg/km^2 in moist, well protected areas, whereas it is much lower (1,800-2,100 kg/km^2) in monoculture teak plantations.

Systematic censuses of cats and their prey species were carried out for three consecutive years after the staff was trained. Round-the-year reports from foot patrols have also been incorporated in the data to determine trends of population, movement, habitat occupancy, etc. Tigers that had left the area a few decades ago have made a comeback in a small way. The first sighting of tiger in recent years was reported from Khairapalli beat of Berbera section in the year 2000. Thereafter, tiger pugmarks have confirmed their presence, along with sightings by villagers on a number of occasions.

The number of leopards is higher than that of tigers. Conservation interventions have enhanced the carrying capacity of the area and with a strong prey base available in the area; the chances are good of establishing a small tiger population, provided the present stringent enforcement continues and hunting pressure is kept at bay.

Results of the tiger censuses in the Berbera Forests

Year	Royal Bengal Tiger			Total	Leopard			Total
1989	-	-	-	-	-	-	-	4
1993	-	-	-	-	2	4	-	6
1998	-	-	-	-	8	3	-	11
2000	1	-	-	1	5	6	2	13
2002	1	2	1	4	6	7	1	14

Conclusions

The following conclusions can be drawn from the results of the on-going conservation efforts:

1. The moist forests occurring in remote patches support higher densities of ungulates.
2. Teak plantations have reduced the densities of ungulates.
3. The under story in the forests has improved due to the reduction in fire incidents, thereby benefiting the ungulates.
4. The creation of waterholes has benefited both the herbivores and the carnivores.
5. The tiger population can be revived in areas that have been severely affected by the organized cutting of trees and poaching of animals, through systematic management interventions and stringent enforcement over a period of time.
6. Increased patrolling and enforcement has increased the confidence level of animals in the area and sightings have increased.
7. The training and capacity of the Forest Department staff to deal with organized timber interests has improved significantly.

References

Chadha, S.K. **Tigers on the Brink – an Orissa story.** p. 76.
Sharma, J.D. **Working Plan of Puri Forest Division**.

Author's address: Sanjeev Kumar Chadha (AIG), Research & Training Division, Room No.538, Paryavaran Bhawan, CGO Complex, Lodhi Road, New Delhi – 110003, India.

FOREST NEWS

Vol.XVIII:No.2

ASIA-PACIFIC FORESTRY COMMISSION CONSIDERS REGIONAL FORESTRY ISSUES

Representatives from 29 member countries, along with observers and representatives from 7 international organizations and 5 international non-governmental organizations, met in Nadi, Fiji, 19-23 April 2004, to consider possible actions to deal with critical issues facing the forestry sector in the region. The twentieth session of the Asia-Pacific Forestry Commission (APFC) was organized by FAO and the Fijian Ministry of Fisheries and Forests. The 29 countries participating eclipsed the record set for an APFC session two years ago in Mongolia.

His Excellency Konisi T. Yabaki, Minister of Fisheries and Forests, Government of Fiji, presided over the meeting as Chairperson. N.K. Joshi (India), Sohn Chan-Joon (Republic of Korea) and Thang Hooi Chiew (Malaysia) were elected Vice Chairpersons for the session. David Rhodes (New Zealand) served as Rapporteur.

While several ongoing international dialogues are addressing forest-related issues at the global level, forestry experts at the APFC session focused on regional initiatives and cooperation among Asia-Pacific countries. The following paragraphs summarize the conclusions and recommendations related to specific agenda topics discussed in the Nadi session. Copies of the full report of the APFC session are available from the FAO Regional Office for Asia and the Pacific (see also: hhttp://www.apfcweb.org/events).

State of forestry in the region

Delegates concurred with FAO's Report on the "State of forestry in the region." They acknowledged many of the common threats to the region's forests, including continued deforestation and degradation of natural forests, illegal and uncontrolled logging, invasive species, forest fires, unmanaged recreation and competition from alternative land uses. The delegates further stressed that the countries were tackling these problems through a variety of measures, but were sometimes constrained by weak institutional capacity, insufficient budgetary resources and inadequate political will.

Nevertheless, several countries reported that deforestation had been curbed or even reversed, although the loss and degradation of natural forests were continuing. Countries generally reported increased use of criteria and indicators, certification, reduced impact logging, and participatory approaches in forest management. A number of countries also expressed concern over declining investments in the forestry sector. On the positive side, the delegates further reported on the increased regional and bilateral cooperation in addressing illegal logging and associated illegal trade of forest products.

Based on the presentations and the interventions from the delegates, the Commission concluded

that members were making progress toward sustainable forest management as a result of reorientation of policies, decentralization and devolution of forest management, application of best management practices, expansion of protected areas, acceleration of plantation development and rehabilitation of degraded areas. The Commission further acknowledged the importance of conserving biological resources effectively, as well as the significance of effective watershed management to ensure reliable supplies of clean water.

Based on the discussions, the Commission recommended that:

- member countries take further action to implement internationally agreed upon actions related to forests, especially the IPF/IFF proposals for action;
- FAO expedite its efforts to help countries build capacity for sustainable forest management, especially by facilitating interaction among countries and by organizing workshops and training sessions at the regional, sub-regional and national levels;
- member countries and FAO explore new avenues for obtaining financing for sustainable forest management, including through partnerships with the private sector;
- member countries increase collaboration in dealing with illegal logging and associated illegal trade of forest products, and FAO was urged to provide additional technical support and to assess the costs and impacts of illegal logging;
- FAO continue promoting conservation of biological resources; and
- FAO continue providing sound information on relationships between forests and water, including flooding, and on successful watershed management approaches.

Forestry activities of interest to the region

The Commission reviewed APFC and FAO-supported forestry activities carried out during the past two years, including follow-up to recommendations of the nineteenth session of the Commission. The activities generally concentrated on four areas: a) ensuring sustainable supplies of wood and fiber; b) continuous improvement in forest management; c) devolution of forest management responsibilities; and d) cross-cutting initiatives. The Secretariat clarified that many regional activities supported by FAO were carried out within the framework of the Asia-Pacific Forestry Commission to take advantage of the opportunities for multi-country and multi-organization collaboration.

The delegates stressed the need for accurate and relevant data to support forest management planning and decision making. The Commission acknowledged the value and usefulness of the information disseminated under the Global Forest Assessment, the Asia-Pacific Forestry Sector Outlook Study, and the State of Forestry in Asia and the Pacific – 2003. FAO was requested to regularly collect and disseminate such information in collaboration with APFC member countries. Member countries also agreed to continue promoting the development and use of criteria and indicators for sustainable forest management and requested FAO to support this work. Further, the delegates noted the positive advances of many member countries in formulating and implementing national codes of practice for forest harvesting, consistent with the Code of Practice for Forest Harvesting in Asia-Pacific developed by APFC. Finally, the delegates acknowledged the importance and relevance of the international dialogue on forests for its member countries, but observed that many countries were unable to fully participate due to limited resources and capacity.

On the basis of the above clarification and interventions from the delegates, the Commission made the following observations and recommendations:

- It acknowledged the relevance of recent APFC and FAO-supported activities in the region and noted with appreciation the follow-up actions that had been taken on the recommendations of the nineteenth session.
- It stressed that despite much positive work initiated by member countries to develop and implement national forest programmes, there is further need to develop and implement the programmes. FAO and the

National Forest Programme Facility were requested to increase their support.

- FAO should continue efforts to enhance national capacities for conducting forest resource assessments, including assessment of tree resources outside forests.
- The seven thematic areas of sustainable forest management, as acknowledged by the International Conference on Criteria and Indicators in Guatemala (February 2003), the fifteenth session of the Committee on Forestry (March 2003) and further discussed at the recent FAO/ITTO Expert Consultation in the Philippines (March 2004), should be used as globally agreed criteria for sustainable forest management, for harmonizing purposes.
- FAO should develop practical guidelines for the sustainable use of non-wood forest products, and work to improve marketing of such products.
- FAO should continue providing support for the implementation of codes of practice and the application of improved forest harvesting.

The Commission endorsed the establishment of the Asia-Pacific Forest Invasive Species Network, under the auspices of APFC. It urged FAO and member countries to support the network as a mechanism for sharing information on existing and potential forest pests and approaches for combating such pests. FAO was requested to work with member countries to mobilize funds to effectively manage the network.

FAO was further commended for its leadership in supporting the work of the Consultative Partnership on Forests (CPF). The Commission urged FAO to continue providing strong support for the CPF. The Commission encouraged FAO and other CPF members to further simplify reporting in order to reduce the burden on countries and to continue efforts to harmonize concepts, terminology and definitions used in assessing, monitoring and reporting on sustainable forest management.

In search of excellence: exemplary forest management in Asia and the Pacific

During a special in-session seminar, the Commission reviewed preliminary results from an APFC initiative to identify instances of exemplary forest management in the region. The *In Search of Excellence* initiative has resulted in more than 170 nominations of forests considered to be well managed, covering 20 countries. The nominations represent a broad range of forest types, management objectives, scale of operations and ownership patterns, reinforcing the premise that there is no single definition of exemplary forest management. Common elements contributing to excellence include societal consensus on management objectives and approaches, attention to livelihoods for forest-dependent people, application of best management practices, and strong commitment to attaining excellence.

The delegates noted the potential for the initiative to help counter the preponderance of negative publicity on forestry and to serve as a catalyst in motivating further improvements in forest management. They recognized that the initiative had stimulated healthy debate among stakeholders on what constitutes good forest management and how to achieve it, and they acknowledged the potential to transfer lessons and experiences from case study forests to similar situations throughout the region. Delegates also recognized the common elements of good forest management which could guide forest management in a variety of contexts.

The Commission appreciated the approach and process used in undertaking the initiative, particularly the emphasis on recognizing and accentuating positive experiences in forest management. Delegates noted that strong bonds tend to link exemplary forest managers to their forests. They further recognized the importance of discernable "champions" in promoting excellence in forest management. An additional key to successful management relates to ensuring the extensive involvement of all stakeholders in establishing the parameters and goals for forest management, especially at local levels.

A publication featuring the 28 case studies and supporting analysis will be brought out in the near future. The Commission recommended that the results of the *In Search of Excellence* initiative be widely distributed and promoted through media briefings, workshops, and the preparation of materials to help managers of nominated forests to promote a common message. The Commission also suggested that FAO consider organizing a side meeting at the next session of the Committee on Forestry (COFO) to feature the initiative.

Financing sustainable forest management

The Commission considered the challenges of securing adequate financing for sustainable forest management. Several member countries shared their experiences in developing innovative funding approaches to support forest management and conservation. Some have established special funds that are financed by voluntary contributions, taxes and fees, donor grants and other sources. Others are testing mechanisms for compensating the provision of environmental services and developing markets for previously non-marketed goods and services.

The costs of fully implementing sustainable forest management were recognized to be significantly above current expenditure levels. However, the delegates did point out that countries with valuable commercial forest resources could potentially finance sustainable forest management by improving prices and taxation systems, strengthening measures for collecting royalties and fees, and controlling illegal activities. Success depended on effective policies and a supportive legal system.

Delegates also acknowledged the potential to generate income and employment from non-wood forest products, environmental services (e.g. carbon sequestration, provision of clean air and water) and ecotourism. The actual realization of such benefits is currently limited, however, and their significance as a source of funding for forestry is still to be determined.

Considering all the challenges and the potential opportunities for securing financing, the Commission encouraged FAO to:

- strengthen its work with donor countries and financial institutions to help facilitate the efforts of developing countries to achieve sustainable forest management;
- continue providing information and advice related to potential sources of financing for sustainable forest management;
- facilitate the exchange of information and experience related to the economic valuation and development of markets for non-wood forest products, environmental services and ecotourism;
- continue raising awareness of the contributions that forests make to the environment, rural development, poverty alleviation and other economic sectors;
- maintain efforts to ensure that sound scientific knowledge on the actual benefits provided by forests and trees is readily available to decision makers; and
- distribute information on guidelines for assessing the magnitude of environmental services provided by forests and the impacts of unsustainable forest management and forest clearing.

Alternative forest management models

During a special in-session seminar, the Commission focused on alternative forest management models to achieve sustainability. Five resource speakers from the region spoke about decentralization, devolution, privatization and the model forest approach compared to the approaches currently carried out by government agencies.

The delegates noted that member countries were increasingly testing and applying innovative forest management models in an attempt to deal more effectively with the pressures being exerted on forests from population growth, agricultural expansion, increasing demand for forest products, industrial development and rapid economic growth. Promising models typically transfer forest management authorities and responsibilities to local governments, civil society and the private sector. Increased

involvement of stakeholders, secure resource tenure, innovative partnerships, increased equity and application of landscape approaches to management are common elements of success.

The participants reviewed experiences with decentralization and devolution of forest management, community-based forest management, the model forest approach to sustainable forest management and transfer of management roles to the private sector. Delegates pointed out that extensive experience had been gained with some approaches, such as community forestry, while others, such as the model forest approach, had been introduced only recently.

Delegated noted that the processes of devolution and decentralization of forest management had not always been smooth, and at times had stalled as a result of conflicts between local governments and forest users. Moreover, foresters had sometimes been perceived as being reluctant to participate in, or lead, the process of devolution and decentralization, or had even been perceived as being opposed to these trends.

Delegates confirmed an increasing trend in the region to involve the private sector in forest management through long-term lease arrangements, management concessions and privatization of forest resources. While the benefits of such approaches may be substantial in the long term, privatization in some cases may have negative social and environmental implications in the near term. Acceptable risk is essential for success, and this is heavily influenced by the operating environment within countries.

The Commission appreciated the positive experiences of several countries in implementing the model forest approach to sustainable forest management, with support from FAO and donors.

The Commission made the following recommendations:

- Considering that existing model forests in the region still require financial support to achieve their full potential, and that several additional countries were interested in applying the model forest approach, FAO should continue discussions with donors to secure funding for a proposed regional model forest network in Asia and the Pacific.
- FAO should review the changing needs, demands and expectations placed on forestry agencies in reorienting, retraining and restructuring as appropriate.
- FAO should continue to monitor experiences in implementing alternative forest management models, disseminate information on such experiences and support efforts to strengthen capacities for effective implementation.

Delegates agreed that none of the alternative forest management models eliminated the need for government forestry agencies. Rather, the roles of forestry agencies may be altered under the new modalities, and the skills needed to facilitate these new approaches may differ from those needed in the past.

Forest conventions, treaties and more: are regional agreements the way to go?

The Commission considered recent developments related to global, regional and bilateral forest-related agreements and arrangements. Delegates expressed their views about the value and feasibility of various options for international and regional approaches, including legally and non-legally binding options.

The Commission recommended that member countries actively participate and provide forestry expertise in the intergovernmental negotiations related to forests, especially the United Nations Forum on Forests (UNFF) and the conventions on biological diversity, desertification and climate change.

The Commission recognized the need for thorough regional preparations prior to the fifth session of UNFF in 2005, which will decide on future international arrangements on forests. The Commission requested FAO to examine the possibility of organizing an inter-sessional meeting for this purpose, or to provide other mechanisms to assist countries' preparations.

The Commission recognized the value and practical benefits of existing regional forest-related agreements and initiatives and urged member countries to strengthen their commitment to implement them. FAO and other international organizations were requested to continue their support for the effective implementation of these regional mechanisms.

Regional issues identified by the Commission for the attention of COFO

The Committee on Forestry (COFO) has expressed a desire to see regional forestry commissions strengthened. In this respect, the Commission wished to bring to the attention of COFO the renewed vitality of the APFC, as demonstrated by the large number of important inter-sessional activities in the past two years and the record level of participation at the twentieth session. The Commission also emphasized that these activities were achieved largely as a result of the commitment and contributions of member countries themselves. Further, the Commission would like to bring to the attention of COFO a number of issues, including the following:

- FAO and other CPF members have continued to support member countries in implementing the IPF/IFF proposals for action through effective national forest programmes, consistent with the recommendations of COFO. The important role of the National Forest Programme Facility was highlighted as well.
- Cognizant with the global concern over illegal logging and associated trade, FAO has been requested to provide additional technical support to help member countries control such activities, and assess their costs and impacts.
- FAO has been requested to examine the potential strengths and weaknesses of regional and global arrangements on forest fires, including the feasibility of developing and implementing a global agreement on fire.
- Awareness needs to be raised on the serious threats from invasive species, and the need to build capacities for dealing with such threats. The establishment of the Asia-Pacific Forest Invasive Species Network, created under the aegis of APFC, is a significant achievement.
- The supply and use of fresh water has become globally significant, and the complex linkages between forests and water are often poorly understood. FAO has been asked to continue providing sound scientific information on relationships between forests and water, including flooding, and on successful watershed management approaches.
- Progress has been made by many member countries in the region in formulating and implementing national codes of practice for forest harvesting, consistent with the regional code developed under the auspices of APFC. The approaches and experiences of Asia-Pacific countries in developing and implementing such codes of practice could provide a useful model for other regions.
- The *In Search of Excellence* initiative has been highly successful, resulting in more than 170 nominations of forests throughout the region considered to be well managed. The initiative helped showcase positive experiences of forest management and heightened consideration of what constitutes good management. The activities under the initiative are to be continued, results further disseminated, possibly including through a side meeting at the next session of COFO.
- There is widespread interest in the potential to generate income and employment from non-wood forest products, providing environmental services and ecotourism. FAO has been asked to facilitate the exchange of information and experience related to the economic valuation and the development of markets for these products and services.
- Forest management approaches are evolving rapidly throughout the world, including through the use of criteria and indicators to assess, monitor and report progress toward the achievement of sustainable forest management. FAO has been asked to review the changes, the new skills and capabilities needed, and assist the forest agencies in reorienting, retraining and restructuring them as appropriate.

Other business

Two workshops were held before the main APFC session: 1) the Regional Workshop on Implementing IPF/IFF Proposals for Action through National Forest Programmes: Strategies, Initiatives and Tools; and 2) the Workshop on Developing an Action Plan for Addressing Forest Invasive Species in Asia and the Pacific. Reports on both workshops were presented to the Commission (see also below in this issue of *Forest News*).

The report on the First Meeting of the Asia-Pacific Forestry Commission Executive Committee was presented to the Commission. The Executive Committee had conducted an analysis of APFC's strengths, weaknesses, opportunities and threats, and made recommendations related to the following: a) enhancing the profile of APFC; b) enhancing the involvement of member countries in APFC activities; c) increasing the participation of the private sector and NGOs in APFC activities; d) increasing funding support for APFC activities; e) streamlining and clarifying the way APFC functions; f) increasing the roles and responsibilities of the Executive Committee; and g) strengthening the APFC Secretariat. The Commission endorsed the report of the meeting and its recommendations. It recognized the valuable contributions of the Executive Committee in reviewing and guiding the work of the Commission and recommended that regular meetings of the Executive Committee be convened between the main sessions of the Commission, giving due consideration to budget implications.

Information items

Forest fires remained a key concern of member countries. The Commission was informed of the outcome of the International Wildlife Fire Summit, convened in Sydney, Australia, in October 2003, and recent developments related to the establishment and implementation of international wildland fire agreements. Several bilateral and regional agreements exist to facilitate cooperation in managing and combating wildland fires, including the ASEAN Agreement on Transboundary Haze Pollution. These issues, including options for developing a global fire agreement, can be discussed at the sixteenth session of COFO in 2005. The same can be taken up further at the Ministerial meeting the Director-General intends to convene at the time of COFO.

The Commission encouraged member countries and FAO to intensify regional collaboration on combating and preventing forest fires, and provide strong support for the effective implementation of existing fire agreements. It requested FAO to assist member countries in the formulation and implementation of effective training programmes to prevent, control and manage forest fires. FAO was also asked to examine the potential strengths and weaknesses of regional and global arrangements on forest fires, including the feasibility of developing and implementing a global agreement on forest fires, taking into account the lessons learned from the development and implementation of existing bilateral and regional arrangements.

The Commission was informed of the outcomes of the XII World Forestry Congress, and noted that the Asia-Pacific region had been well represented at the Congress, with more than 250 participants and a high number of written contributions.

Date and place of the next session

Offers to host the twenty-first session of the APFC (to be convened in 2006) were made by the delegations from India, Philippines and Viet Nam.

PRE-SESSION ASIA-PACIFIC FORESTRY COMMISSION WORKSHOP "IMPLEMENTING IPF/IFF PROPOSALS FOR ACTION THROUGH NATIONAL FOREST PROGRAMMES: STRATEGIES, INITIATIVES AND TOOLS"

The Regional Workshop on Implementing IPF/IFF Proposals for Action through National Forest Programmes: Strategies, Initiatives and Tools was organized by FAO and hosted by the Government of Fiji, 16 to 17 April in Nadi, Fiji. It was held in conjunction with the twentieth session of the Asia-Pacific Forestry Commission. The workshop was co-sponsored by the U.S. Department of State/USDA Forest Service, the German Agency for Technical Cooperation (GTZ) projects in Fiji and Indonesia, and the National Forest Programme Facility. It brought together 67 experts from various countries, members of the Collaborative Partnership on Forests (CPF) and other international, regional and sub-regional organizations, including non-governmental organizations.

The keynote address was given by H.C. Thang (Malaysia) on "Implementation of the IPF/IFF Proposals for Action at the national level." His principal position is that each country should design its own national approach for assessing and integrating the IPF/IFF Proposals for Action (PA). Only through this means it is possible to address issues of common concern of all stakeholders from the private sector, non-governmental organizations and governments. Next, not all PAs are relevant to all countries, and so a useful first step would be to analyze which Proposals are relevant and prioritize them for action. Implementation of the IPF/IFF PAs should serve as a process to assist countries to adopt policies and strategies for a holistic and cross-sectoral approach to the management, conservation and sustainable development of forest resources, and as a means to progress towards the attainment of sustainable forest management. In addition, the implementation of the IPF/IFF PAs and the use of criteria and indicators for sustainable forest management would adequately address the activities of the CBD's Expanded Programme of Work on Forest Biological Diversity, as well as its Ecosystem Approach to managing natural ecosystems.

The keynote address was followed by three introductory papers, as follows:

- Implementing national forest programmes: small steps for big changes – S. Appanah & E. Mansour (FAO, Bangkok and Rome, respectively)
- Addressing priority cross-sectoral issues in the Asia-Pacific region to support national forest programme implementation – J. Rodgers and A. Sisifa (Fiji)
- Strengthening local stakeholder participation in national decision making – P. Walpole (Philippines)

The three presentations discussed how forest policies are being made more holistic and cyclical in approach with the implementation of the national forest programmes, cross-sectoral considerations in executing forestry plans, and how governments' planning is currently being influenced from bottom-up processes ongoing in many countries in the region.

Following the introductions, the workshop held three working groups, on the following topics:

- Stakeholder participation – Case studies from Australia (E. Jimenez) and Indonesia (Agus Justianto) on how stakeholders participate effectively in national forest programme processes;

- Cross-sectoral cooperation – Case studies from Vietnam (Vu Van Me) and Bhutan (Dechen Dorji); and
- Forests and poverty reduction – Case studies from India (K. Balasubramaniam) and China (Liu Jinlong).

The three groups formulated recommendations on how countries can enhance multi-stakeholder participation, increase linkages between forestry and other sectors using the national forest programme process, and strengthen the contribution of forests to poverty alleviation.

The final session explored effective approaches and knowledge sharing tools for implementing Proposals for Action. Presentations were made on:

- National assessment of Vanuatu's progress in implementing the IPF/IFF Proposals for Action – a tool to assist countries to measure progress and establish priorities for sustainable forest management – P. Lawrence and H. Tate (Australia & Vanuatu);
- The National Forest Programme Facility – T. Enters (FAO, Bangkok;
- Implementing the IPF/IFF Proposals for Action in Indonesia – 5 years of experience – Agus Justianto (Indonesia)
- Implementing proposals for action to promote SFM in New Zealand – J. Eyre (New Zealand)

The session's speakers highlighted the opportunities available for countries to implement national forest programmes, tools to measure progress, and how even in the absence of specific national forest programmes, the proposals for action can still be incorporated and implemented in practice.

The workshop served as a forum to exchange country experiences and to catalyze efforts to implement the Proposals for Action, especially through the national forest programmes. It also provided an opportunity to inform experts about recent support initiatives, and the developments in international forest dialogues, especially the United Nations Forum on Forests (UNFF).

Many participants described increasing efforts to categorize, assess, prioritize and implement the relevant Proposals for Action, despite the limited capacity to implement them and to report on progress, partially due to overwhelming reporting requests by international processes. They recommended that countries should work on boosting the implementation, effective stakeholder participation, cross-sectoral cooperation, and increase the contribution of forests to poverty alleviation.

Participants recommended that countries should, for instance, develop procedures and modalities for effective stakeholder participation in the national forest programme process, including clearly identifying the roles of stakeholders and means to account for their inputs; establish high-level, cross-ministerial collaboration mechanisms, extend devolution of forest management from degraded forest areas to production forest areas, review methods of valuing forest goods and services, and help the poor to organize themselves.

They also recommended that FAO and other CPF members should continue to facilitate the implementation of the Proposals for Action and assist countries in sharing experiences and building capacity for effective participation in international forest-related deliberations. In addition, the participants stressed the importance of including forestry expertise in the national delegations that attend the negotiations.

"Nature does not complete things. She is chaotic. Man must finish, and he does so by making a garden and building a wall."

-- Robert Frost --

ASIAN FORESTERS PLAN FOR COMBATING INVASIVE SPECIES

Experts from 14 countries met in conjunction with the twentieth session of the Asia-Pacific Forestry Commission (APFC), in Nadi, Fiji, 17-18 April 2004, to design a collaborative plan of action to help combat the threats posed by invasive species in the region. The costs of invasive species in the region total hundreds of billions of dollars each year, in terms of treatment measures, environmental impacts and lost production – with the costs to forestry constituting a significant proportion of this total.

The workshop on *Developing an Action Plan for Addressing Forest Invasive Species in Asia and the Pacific* reviewed the list of potential activities prepared during the *Asia-Pacific Invasive Species Conference* held in Kunming, China, in August 2003 – adding to these, deleting as appropriate, and identifying priority areas.

The workshop validated the recommendation made by the Kunming conference to establish an Asia-Pacific Forest Invasive Species Network under the auspices of APFC. A consensus also emerged on five high priority areas for action:

1. Organizational structures to support the network

As an APFC-sanctioned initiative, the Network will be supported by the APFC secretariat.

Country-nominated focal points will be important links in the functioning of the Network. Focal points will also be responsible for coordinating Network activities within countries, and for facilitating the timely exchange of information. To date, 21 countries have designated their focal points. The country focal points will also provide linkage between the Network and other regional and global forest invasive species initiatives.

2. Stock-taking of national activities

The Network will complete a stock-taking exercise of national activities currently being implemented on forest invasive species. A starting point will be the review of country reports prepared for the *Asia-Pacific Forest Invasive Species Conference* to identify gaps potentially requiring capacity building. The Network will prepare guidelines to assist in standardizing the information reported in the original country reports and during national stocktaking exercises.

3. Awareness raising

The Network will collaborate in the development of a regional awareness strategy for forest invasive species. The strategy will include an outline of objectives and identify target audiences and measures that can be implemented to raise regional awareness about forest invasive species.

4. Capacity building

Opportunities for collaboration on specific capacity-building activities will be identified through national stocktaking exercises. The Network will also implement other specific capacity-building opportunities identified and deemed appropriate by member countries.

5. Database and information sharing

The national focal points will play a key role in facilitating the exchange of information on forest invasive species among Network members. Several mechanisms could be developed to facilitate information exchange including website development, newsletters and/or a regional forest invasive species listserver.

The Chinese Academy of Sciences has commenced work on developing a forest invasive species database, which will provide a system for collating, storing and readily accessing information gathered by the national focal points from the region. The database will be further developed in collaboration with Network members, cognizant of cross-sectoral boundary issues.

The workshop discussed these priority activities in detail and identified specific actions to be completed prior to the next session of the Asia-Pacific Forestry Commission in 2006. The activities will comprise elements of a regional action plan. Among the most significant is the development of a forest invasive species database (work led by the Chinese Academy of Sciences). It is anticipated that focal points will play a key role in facilitating the exchange of information and coordinating other activities within countries.

The second day of the workshop in Fiji encompassed a wider audience of APFC delegates and focused on raising awareness of issues related to forest invasive species.

Mr. Hosny El-Lakany, FAO Assistant Director-General for Forestry, used the occasion to formally announce the establishment of the *Asia-Pacific Forest Invasive Species Network*.

ONLINE HELP AND ADVICE ON OBTAINING FUNDING FOR FORESTRY RELATED PROJECTS

(English) http://www.fao.org/forestry/site/17261/en
(French) http://wwww.fao.org/forestry/site/1726/fr

The above links lead to fora that have been set-up by the Collaborative Partnership on Forests' CPF-Sourcebook and the National Forest Programme Facility to allow people to share information, ideas and experiences on funding for forestry related projects – forestry, forest products, forest management and forest sustainability projects. The online help is aimed at assisting fund seekers to further and enhance their funding search as well as increasing their skills on how to go about soliciting funding for their projects. Representatives of grant-making bodies are also invited to post news and advice for potential applicants.

For more information and guidance on how to post messages see the following URL: http://www.fao.org/forestry/foris/webview/pageview.jsp?pageId=25608&langId=1

"You can't stay in your corner of the Forest waiting for others to come to you. You have to go to them sometimes."

-- Pooh's Little Instruction Book, inspired by A.A. Milne --

WHAT WERE THE MOST SIGNIFICANT DEVELOPMENTS IN THE FORESTRY SECTOR IN ASIA-PACIFIC IN 2003?

At the beginning of 2004, FAO conducted an e-mail survey to ascertain what people involved in forestry in the region considered to be the most important developments in forestry in their own country, and in the region as a whole in 2003. Comments were received from more than 65 individuals, providing a range of perspectives.

Two themes were emphasized:

- Illegal logging and governance issues
- Decentralization and devolution of forest management

Illegal logging was the most frequently mentioned issue at the regional level. This is interesting since illegal logging is usually considered to be a national issue, yet very few respondents indicated that it was important for their own country over the past year. Several initiatives are currently being undertaken to address illegal logging in the region.

Many respondents indicated that decentralization and devolution (in various forms) were significant developments in their particular country over the past year. This matches with the ongoing trends throughout the region towards the devolution of responsibilities and rights to local communities.

The results of the survey are summarized below. They are not listed in any particular order, nor do they necessarily reflect the views of FAO or *Forest News* editors.

1. What was the most significant issue, development or event that occurred in your country in 2003 that had (or will have) significant impact on forests or forestry?

Responses:

Australia

- Development of the Australian forest certification standard
- Large wildfires in early 2003, which led to a review of the organization of fire control, the management of prescribed burning practices and the planning of plantation layouts
- Public debate over water use by plantations and the extent to which plantation expansion should be regulated
- Controversy about logging of Tasmanian old-growth forests
- Approval/release of National Plantations Strategy to 2020

Brunei

- The drafting of the "*Forest Act and Forest Rules*" subsequently submitted to the Attorney General for further review and approval

Cambodia

- Passage of the Community Forestry Sub-Decree
- Increasing role of commune (smallest unit of government) in land-use planning
- Appointment of SGS as the new forest monitor, replacing Global Witness

China

- Implementation of the six key national forestry programs:
  - Natural forest protection program
  - Program for conversion of cropland to forest and grass land
  - Program to combat desertification in Beijing and Tianjin
  - Shelterbelt development program for the middle and lower reaches of the Yangtze river

- Wildlife conservation and building of nature reserves program
- High yield timber plantation development program

India

- The international conference on - *Quality Timber Products of Teak from Sustainable Forest Management (SFM)* in Kerala (December 2003)
- Formation of the National Forestry Commission
- Greater role of the National Medicinal Plants Board in the conservation, development, marketing and exports of medicinal plants in the country
- Diminishing role of foresters in biodiversity conservation
- Creation of two categories of private protected areas, *community reserves* and *conservation reserves*, which recognize and legitimize private conservation initiatives

Indonesia

- "There were no significant developments (business as usual) – the reform process stopped"
- Launching of the National Social Forestry Programme
- Launching of the National Rehabilitation Programme (of watershed management areas)
- Inclusion of forest-related crimes in the anti-money-laundering law
- Increasing attention on illegal logging and how to combat it
- Reduction of the AAC from approximately 12.1 million m^3 to 6.89 million m^3
- Discussions on agrarian reform and natural resource management
- Reforestation declarations by the government responding to the many natural disasters in Indonesia during the year – especially floods and landslides

Japan

- Development of the Sustainable Green Ecosystem Council for forest certification
- Development of an action plan and approval of a budget to support the international commitments under the Kyoto Protocol, including an increase of carbon sinks through sustainable forest management
- "Green Recruitment Program" initiated to increase the number of skilled forest workers by providing local governments and forest cooperatives with financial assistance for employment and training

Korea

- Entering into force of the new Forest Land Management Law
- Revision of the 4^{th} forest development plan (the national forest plan for the period 1998-2007)
- Establishment of the "Act for the Protection of the *Baekdoo Mountains*"
- The damage wrought on Korean forests by giant typhoon "Maemi"
- Reform of the Korea Forest Service
- The presidential election in 2002
- Nation-wide survey of mountain villages in Korea

Lao PDR

- Limited acknowledgement of forestry in the National Poverty Eradication Programme published in 2003, reflecting poor recognition of the opportunities for forestry to contribute to poverty reduction
- Debate and approval of national "Forest Strategy 2020"

Malaysia

- Implementation of criteria and indicators for assessing and monitoring sustainable forest management at the forest management level
- Reduction in the loss of forest biological diversity and damage to the environment during forest harvesting, and an increase in the extent of protected areas
- DNA analysis for tree tracking

Myanmar

- Increase in awareness and interest in "community forests"
- Initiation of Bago Yoma Greening (reforestation) Project
- National economic policy for the controversial expansion of agriculture and fisheries
- Construction of dams and reservoirs

- Increased export of teak logs
- Release of controversial report on logging and natural resource exploitation by Global Witness (London), which was refuted by the government

New Zealand
- Purchase of significant forests (Central North Island Forest Partnership and Fletcher Challenge Forests) by US pension funds
- Dramatic increase in bulk shipping costs from New Zealand to East Asia and the Pacific (60 percent increase) reducing log prices, stumpage margins and profits for New Zealand forest owners
- Government announced policy on climate change, including a decision not to devolve forest-based carbon sink credits and their associated liabilities for the first commitment period, under the Kyoto Protocol
- The discovery and containment of new pest threats (the fall webworm, gum leaf skeletoniser, Asian gypsy moth) and the quarantining of pine pitch canker, as part of on-going surveillance for protecting New Zealand's forests from alien invasive species
- The UNFF intersessional meeting on "*The Role of Planted Forests in Sustainable Forest Management*", Wellington, (March)
- The loss of value of exported forest products as a result of the appreciation of the New Zealand dollar relative to the US dollar

Nepal
- Government policy to tax the surplus sales of *Shorea robusta* and *Acacia catechu* from community forests at 40 percent
- Government's continued policy to pilot collaborative forest management in the Terai region of Nepal, rather than expand the community forestry model
- Initiation of district-level multi-stakeholder forestry coordination committees in 11 Terai districts of Nepal - District Forest Coordination Committees
- Ongoing Maoist insurgency and political uncertainty

Papua New Guinea
- Jailing of the chairman of the National Forest Board for "contempt of court" for refusing to pay customary resource owners "timber royalties" for trees taken from customary land

Pakistan
- Institutional and legal reforms in the Forest Department
- Widespread and continuing death of one of the most valuable and extensively planted tree species in Pakistan, *Dalbergia sissoo.*

Philippines
- Revision of the Philippine Forestry Master Plan
- Development and testing of Environmental Users Fees (EUF), to transfer payments from lowland water users to upland communities for watershed management and rehabilitation
- A nationwide assessment of community-based forest management to move towards more effective implementation
- Burgeoning eco-tourism projects in many upland and mangrove areas, particularly those under community-based management
- Increasing role of barangay (smallest unit of government) in natural resource management
- Increasing conflict between indigenous cultural communities/indigenous peoples and the government, related to management of natural resources within ancestral domain areas, based on "national interest"
- Debate on the constitutionality of the ancillary rights of mining concessionaires over surface natural resources such as timber
- Suspension of resource use permits issued to community-based forest management agreement holders

Thailand
- Restructuring of the Royal Forest Department
- Increase in area of national parks
- Increasing role of tambon (smallest unit of government) in watershed management

Viet Nam

- Revision of the Land Law to provide legal recognition to communities in forest management
- Acknowledgement of the role of communes and districts in supporting community forest management

2. ***What was the most significant issue, development or event that occurred in the Asia-Pacific region in 2003 that had (or is likely to have) significant impact on forests or forestry?***

Responses:

- Asia Forest Partnership (launched at WSSD)
- Ongoing debate and encouragement towards good forest governance and tackling of corruption within the forestry sector
- Bali declaration on illegal logging
- Increasing (international) attention to the issue of illegal logging
- Negative impact of illegal logging on the timber market in East and Southeast Asia
- Increasing emphasis on the role of local communities in forest management
- Emergence of forest management based on an ecosystem approach to produce multiple forest goods and services simultaneously
- Development of national codes of practice for forest harvesting in the region
- China joining the World Trade Organization
- Continuing rise of China as a mega-importer of forest products
- Continuing constraints on the availability of financial resources for forestry resulting from the economic downturn of the late 1990s and early 2000s
- Clarification of forestry issues eligible for credits under the Clean Development Mechanism
- Desertification in Northeast Asian countries such as China and Mongolia, and the ensuing sandstorms
- Growing importance of decentralization and attention to building capacity of local government units (e.g. tambon, barangay, commune) for engaging in forest management
- Increased articulation of forest-water linkages
- Better understanding of cloud forests
- Greater focus on assisted natural regeneration
- Convening of the World Social Forum in Mumbai (January 2004), which highlighted forests and forestry and the impacts of forest degradation
- Increased availability of forest-related data in Asia
- Convening of the international conference on *"Eucalypts in Asia"* in Zhanjiang, China (April)
- Continuing decline in forest area and the failure of reforestation to match these losses
- Development of the ASEAN regional criteria and indicators and launching the Pan ASEAN timber certification initiative
- Slow pace of establishing firm programmes linking forestry and poverty alleviation
- Resurgence of the Thai economy and resulting strain on natural resources of the region
- Expanding adoption of joint forest management, in various forms, throughout the region
- Convening of the Asia-Pacific Forest Invasive Species conference in Kunming, China, and establishment of Asia-Pacific Forest Invasive Species Network

"Nature knows no pause in progress and development, and attaches her curse on all inaction.

-- Johann Wolfgang von Goethe --

FAO ASIA-PACIFIC FORESTRY CALENDAR

21-23 July 2004. Hangzhou, China. ***Regional Seminar on Forest Certification in China: Latest Developments and Future Strategies.*** Contact: Mr. Simmathiri Appanah, National Forest Programme Advisor (Asia Pacific), FAO Regional Office for Asia and the Pacific, Maliwan Mansion, 39 Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4136; Fax: (662) 697-4445; E-mail: simmathiri.appanah@fao.org

20-24 September 2004. Lin'an, China. ***Regional Workshop on Strategic and Operational Work Planning and Regional Model Forest Network Meeting for Enhancing Regional Networking Opportunities Between Model Forests.*** Contact: Mr. Brian Bonnell, Senior Program Officer, Asia, International Model Forest Network Secretariat, PO Box 8500, 250 Albert Street, Ottawa, Ontario K1G 3H9, Canada; Tel: 613-236-6163 ext 2114; Fax: 613-234-7457; E-mail: bbonnell@idrc.c

14-18 March 2005. Rome, Italy. ***17th Session of the Committee on Forestry.*** Contact: Doug Kneeland, Programme Coordinator, Programme Coordination Unit, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; Tel: 39-06-570-53925; E-mail: Douglas.Kneeland@fao.org

mid-2005. Kota Kinabalu, Sabah, Malaysia. ***Symposium on Tropical Rainforest Rehabilitation & Restoration – Existing Knowledge and Future Directions.*** Co-organized by: FAO RAP, World Wide Fund for Nature (WWF), Yayasan Sabah and the Sabah Forestry Department. Contact: Patrick Durst, Senior Forestry Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4139; Fax: (662) 697-4445; E-mail: Patrick.Durst@fao.org

FOREST NEWS is issued by the FAO Regional Office for Asia and the Pacific as part of TIGERPAPER. This issue of FOREST NEWS was compiled by Patrick B. Durst, Senior Forestry Officer, FAO/RAP.

FORESTRY PUBLICATIONS: FAO REGIONAL OFFICE FOR ASIA AND THE PACIFIC (RAP)

For copies, please write to: *Forestry Section, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand*.

1. Leucaena Psyllid in the Asia Pacific Region: Implications for its Management in Africa (RAPA Publication 1994/13)
2. Asia-Pacific Tropical Forestry: Ecological Disaster or Sustainable Growth? (RAPA Publication 1994/18)
3. Workshop Report: Reform of the Forestry Sector: Towards a Market Orientation in China, Laos, Mongolia, Myanmar, and Vietnam (RAPA Publication 1995/4)
4. Beyond Timber: Social, Economic and Cultural Dimensions of Non-Wood Forest Products in Asia and the Pacific (RAP Publication 1995/13)
5. A Guide to the Identification of Diseases and Pests of Neem (*Azadirachta indica*) (RAP Publication 1995/41)
6. Non-Wood Forest Products in Bhutan (RAP Publication 1996/6)
7. Asia-Pacific Agroforestry Profiles: Second Edition (APAN Field Doc. No.4/RAP Publication 1996/20)
8. The Khao Kho Story: Reclaiming the Barren Hills of Thailand's Central Highlands (RAP Publication 1996/27)
9. Reports Submitted to the Regional Expert Consultation on Eucalyptus - Vol.II (RAP Publication 1996/44)
10. Forests and Forest Management in Mongolia (RAP Publication 1997/4)
11. Non-wood Forest Products: Tropical Palms (RAP Publication 1997/10)
12. Gone Astray: The Care and Management of the Asian Elephant in Domesticity (RAP Publication 1997/16)
13. Directory of Selected Tropical Forestry Journals and Newsletters (2nd Edition) RAP Publication 1997/17 - FORSPA Publication No.19/1997.
14. Forest Dependent Survival Strategies of Tribal Women: Implications for Joint Forest Management in Andhra Pradesh, India (RAP Publication 1997/24)
15. Labor-Intensive Harvesting of Tree Plantations in the Southern Philippines (RAP Publication 1997/41)
16. Ecotourism for Forest Conservation and Community Development (RAP Publication 1997/42
17. Leasing Degraded Forest Land: An Innovative Way to Integrate Forest and Livestock Development in Nepal (RAP Publication 1998/4)
18. Carbon Dioxide Offset Investment in the Asia-Pacific Forestry Sector: Opportunities and Constraints (RAP Publication 1998/9)
19. Asia-Pacific Forestry Towards 2010 - Executive Summary: The Asia-Pacific Forestry Sector Outlook Study (RAP Publication 1998/22)
20. Asia-Pacific Forestry Towards 2010 - Report of the Asia-Pacific Forestry Sector Outlook Study
21. Regional Strategy for Implementing the Code of Practice for Forest Harvesting in Asia-Pacific
22. Trees Commonly Cultivated in Southeast Asia - An Illustrated Field Guide 2nd Edition. (RAP Publication 1999/13)
23. Decentralization and Devolution of Forest Management in Asia and the Pacific (RAP Publication 2000/1 - RECOFTC Report No.18)
24. Asia-Pacific Forestry Commission Fifty Years (RAP Publication 2000/2
25. Development of National-level Criteria and Indicators for the Sustainable Management of Dry Forests in Asia: Workshop Report (RAP Publication 2000/07); Background Papers (RAP Publication 2000/08)
26. Forests Out of Bounds: Impacts and Effectiveness of Logging Bans in Natural Forests in Asia-Pacific (RAP Publication 2001/08); Executive Summary (RAP Publication 2001/10)
27. Regional Training Strategy: Supporting the Implementation of the Code of Practice for Forest Harvesting in Asia-Pacific (RAP Publication 2001/15)
28. Trash or Treasure? Logging and Mill Residues in Asia and the Pacific (RAP Publication 2001/16)
29. Proceedings of the International Conference on Timber Plantation Development
30. Monograph on benzoin (Balsamic resin from *Styrax* species) (RAP Publication: 2001/21)
31. Applying Reduced Impact Logging to Advance Sustainable Forest Management (RAP Publication: 2002/14
32. Report of the Asia-Pacific Forestry Commission 19th Session (RAP Publication: 2002/21 FO/APFC/2002/REP)
33. Communities in Flames: Proceedings of an International Conference on Community Involvement in Fire Management (RAP Publication: 2002/25)
34. Giants On Our Hands (RAP Publication: 2002/30)
35. Community-based fire management: case studies from China, The Gambia, Honduras, India, the Lao People's Democratic Republic and Turkey. (RAP Publication 2003/08)
36. State of Forestry in Asia and the Pacific - 2003: Status, changes and trends (RAP Publication 2003/22)

Periodicals

- Tigerpaper/Forest News
- APANews

-