



FEATURING  
FOREST NEWS

# TIGER PAPER

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# DISCOVERY OF THE INDIAN CHAMAELEON (*Chamaeleo zeylanicus* Laurenti) IN THE ARAVALLI FOOTHILLS OF RAJASTHAN (INDIA)

by Shalini Gaur

## Introduction

In July 2004, the author took part in a survey of the Aravalli foothills in the Desuri area (Pali District) for observations on reptiles. The rains were still awaited and drought conditions were prevailing in the completely hilly terrain. Drizzling rain in certain areas brought the temperature down slightly in the Desuri valley. The team was surprised to sight a lizard clinging to the twigs of a forest bush. The lizard was later identified as an Indian chamaeleon (*Chamaeleo zeylanicus* Laurenti), and this constituted the first record of this endangered species from the Aravalli region of Rajasthan.

## Habitat

The hills of this region are separated from each other by large and small temporary streams of rain water. The whole tract, on both slopes of the main Aravalli hills, is made up of rocky plateaus with runnels of water in between. The area was formed by rocks like charnokites, leptinites and other gneissic rocks of the Archaean and Ordovician periods. Some areas contain many sandstone formations. The ground terrain is covered by red, brown and black laterite soils derived from igneous and metamorphic rocks. The hills and valleys in the area are covered with moderately developed forests comprised of seasonal grasses, herbs, shrubs and trees such as *Acacia senegal*, *A. leucophloea*, *Ziziphus mauritiana*, *Prosopis juliflora*, *Grewia tenax*, *Balanites aegyptiaca*, *Capparis decidua*, *Euphorbia nivulia*, *Justicia adhatoda*, *Securinega leucopyrus*, *Anogeissus pendula*, *Aegle marmelos*, *Anogeissus latifolia*, *Bauhinia racemosa*, *Boswellia serrata*, *Butea monosperma*, *Cassia fistula*, *Diospyros*

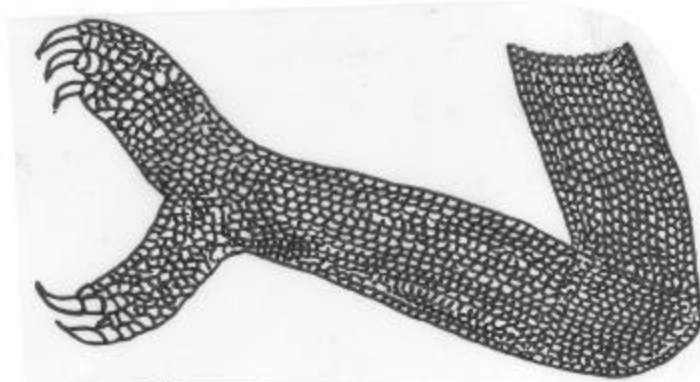
*melanoxydon*, *Mitragyna parvifolia*, *Wrightia tinctoria*, etc.

## Systematic account

This arboreal lizard belongs to the family Chamaeleonidae, which includes two genera and fifty species that are distributed throughout the world. The genus *Chamaeleo* is distributed in tropical Africa, the south Arabian peninsula, peninsular India and the Rann of Kutch. Elsewhere, the species has been recorded from Madagascar, and in fact more than half of the known species are available in Madagascar only.

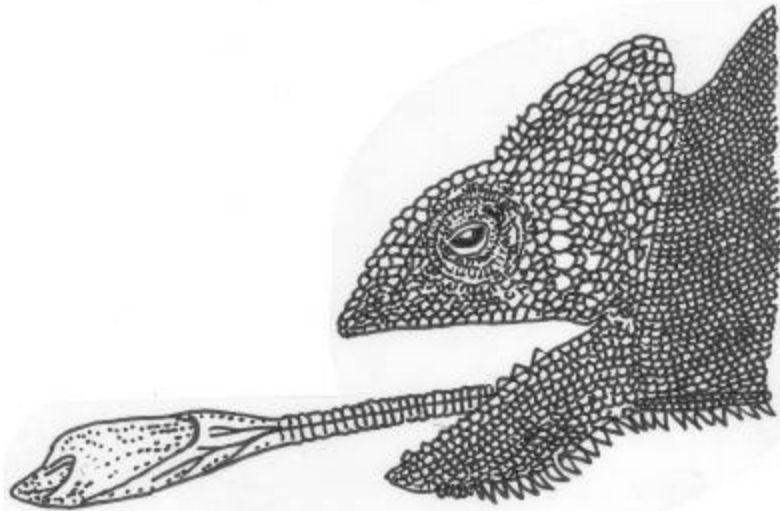
The lizard has remarkable abilities of camouflage and exhibits cryptic concealing mimicry. This species is able to exhibit extreme color changes. The general coloration is usually greenish, but a specimen recorded from the Aravalli foothills showed variations by having a light yellow dorsal color pattern with black spots, spackles and streaks. Dots of irregular shape are present on the lateral sides and the dorsal aspects of the limbs and tail. It clings to the branches of trees and bushes with the help of its prehensile tail (which is as long or longer than the head and body length together) and opposable claws. The body is dorso-laterally flat with a distinct low, serrated crest or ridge on the dorsal (spinal) aspect. The anterodorsal crest is most prominent and bends slightly in the posterior direction and forms an army cap-like structure called a casque. The eyes are prominent and are capable of independent movement in all directions – like a searchlight. The opening of the pupil is a transverse slit and the whole eye is covered by a lid. The tongue is cylindrical and extremely flexible and can be extended to a length equal to the complete body length; it is made of extremely elastic tissue and its anterior end is

**TEXT FIG. - 1**



*Chamaeleo zeylanicus*: Hand

**TEXT FIG. - 2**



*Chamaeleo zeylanicus* : Lateral view of head

club-shaped (almost like a cup at the tip) covered with a viscid secretion. The tongue is fixed on the hyoid apparatus like a coiled spring and can shoot out with great speed and accuracy. The hands and feet are modified and adapted for claspings; the claws are simple. The scales on the body are smooth and the head and body are covered with uniformly flat tubercles. The male has a spur-like tarsal process. The standard length of the chameleon is 227 mm, with a tail length of 189 mm.

Chameleons are mainly insectivorous. Although the lizard itself is slow-moving and sluggish, it captures prey with a tongue that springs out with great speed and draws it back into the mouth with the help of the spoon-like anterior tip.

Chameleons breed from October to December. Thirteen to thirty-one oval eggs are laid in a hole and the female cares for the eggs.

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#### **References**

- Acharya, H.N.G. 1933. **The occurrence of the common chameleon (*Chameleon calcarata*) in Gujarat.** *J. Bombay Nat. Hist. Soc.*, 36:513-514.
- Sharma, R.C. 2002. **The fauna of India and adjacent countries. Reptilia (Sauria).** Volume II:1-430.
- Trench, J. 1912. **Notes on the Indian Chameleon.** *J. Bombay Nat. Hist. Soc.*, 47:627-623.
- Whitaker, R. 1978. **Breeding record of the Indian Chameleon (*Chameleo zeylanicus*).** *J. Bombay Nat. Hist. Soc.*, 75-232.

*Author's address: Desert Regional Station, Zoological Survey of India, Jhalamand, Jodhpur, E-mail: [drshalini20003@yahoo.co.in](mailto:drshalini20003@yahoo.co.in)*



# MASS FLOWERING OF UMBRELLA BAMBOO IN SHENNONGJIA NATIONAL NATURE RESERVE OF CHINA

by Deng Lan, Zhao Benyuan and Zhu Zhaoquan

## Introduction

On 17 April 1907, Ernest Wilson (1876-1930) collected “one of the most beautiful Chinese bamboos” from Fangxian (now the Shennongjia National Nature Reserve) in western Hubei of central China. This bamboo was named *Arundinaria murielae*, after Wilson’s daughter Muriel. Later, it was assigned to a newly established genus – *Sinarundinaria* Nakai. Presently, it is included in the genus of *Fargesia* Franchet (Keng and Wang, 1996). *Fargesia murielae*, commonly known as umbrella bamboo, was introduced to Kew Gardens in the U.K. in the early 20<sup>th</sup> century and all umbrella bamboo plants found in European countries are the vegetative offspring of this clone (Eberts, 1996; Gielis, 1999). Umbrella bamboo is the most successful and widely grown ornamental bamboo in the West.

From 1993 to 1998, umbrella bamboo plants simultaneously flowered and died throughout European and American gardens in the first mass flowering since 1907, when it was first introduced to Britain (Eberts, 1996; Gielis *et al.*, 1999; Shannik, 1999). The authors’ recent study was to report on the flowering behavior of this bamboo in its sole native home, the Shennongjia National Nature Reserve, which is a member of UNESCO’s Man and Biosphere (MAB) World Reserve Network.

Umbrella bamboo is mainly distributed in the western part of the reserve, where the geological rifts and folds, enhanced by subsequent erosion and shearing, have formed a complex landform with an area of approximately 60,000 ha and elevations ranging from 420 m to 3,105.4 m. The local climate is a transitional type of the northern subtropical zone and the warm-temperate zone,

with cold-dry winters and warm-rainy summers (Zhu and Song, 1999).

## Approach

Field observations were carried out frequently during 1996-2001. It was observed that in the reserve, 95% of the bamboo clumps completely flowered and gradually died during the period 1996-2000. A few isolated clumps (about 5%) remained. Thus, it can be concluded that the flowering of umbrella bamboo is of the gregarious type. In 1996, the flowering occurred only on the bamboo stands below 2,700 m, and about 10% of the total population flowered that year. In 1997-1998, flowering extended up to 2,800 m and about 40% of the population bloomed. In 1999, flowering covered all altitudinal ranges and 38% of the population flowered that year. Flowering in 2000 only occurred on the mountaintops above 2,800 m and affected 10% of the population.

After the mass flowering and succeeding simultaneous die-off, the recovery of umbrella bamboo totally depends on the establishment and growth of bamboo seedlings. Our investigations showed that most bamboo seedlings came out in the following year after the gregarious flowering. The density of bamboo seedlings, on an average level, was as high as  $54.6 \pm 48.0$  in a  $10 \times 10 \text{ cm}^2$  plot one year after mass flowering, but rapidly decreased to  $11.3 \pm 10.1$  seedlings per  $100 \text{ cm}^2$  in the second year. During the third and fourth years, the seedling density seemed to be relatively stable, as the mortality of older seedlings was compensated by the newly appeared ones.

## Discussion

The life cycle of many bamboo species is characterized by an unusual flowering habit. They often flower and die simultaneously over wide areas after vegetative regeneration, at intervals ranging from a few years to up to 120 years (Janzen, 1976; Campbell, 1985). In Europe and North America, this species flowered in 1993-1998 (Eberts, 1996; Gielis *et al.*, 1999; Shannik, 1999). Considering that this is the first simultaneous flowering since 1907, its flowering interval was estimated as being about 90 years (Shannik, 1999). However, we should be cautious in accepting this estimation because this species was introduced in the West as a vegetative clone, rather than as seeds or young seedlings.

Anecdotal evidence from a number of local elders indicated that the umbrella bamboo did not simultaneously flower during the "establishment of new China" (the People's Republic of China) in 1949 and 1996, but the elders could not recall the last flowering prior to 1949, which left a long gap between 1907 and 1949. In April 1907, Ernest Wilson recorded that this bamboo (specimen *Wilson 1462*) was "2-4 m tall, stems golden, without flowers" (Sargent, 1911). In 1922 and 1926, the Chinese pioneer botanists H.R. Cheng and R. Cheng respectively visited Shennongjia; however, they neither recorded nor collected this bamboo species. We assume that the bamboo did not flower when they were there, as they would otherwise have had a flowering collection. The first record of this species in China is probably the vegetative specimen collected by Chang H. Zhou in 1935 (in the Herbarium of Wuhan University, "*Arundinaria* sp.). In 1943, another Chinese botanist, Zhan Wang, visited the umbrella bamboo ranges on the mountaintop. His colleague, the local governor Wen Z. Jia, described the umbrella bamboo stands as "bamboo like a sea and fir shading the sky." Thus, we can assume that umbrella bamboo did not flower between 1907 and 1996 in Shennongjia.

However, we cannot confirm that the flowering interval of umbrella bamboo is 89

years (1907-1996), because Wilson's field records indicated that umbrella bamboo was in the vegetative phase (2-4 m high, without flowers), rather than in the phase of seed or seedling at the beginning of its life cycle. Considering that *Fargesia* seedlings need about 20 years to reach the full height of the bamboo community prior to flowering death (Taylor and Qin, 1993), we estimate that the flowering interval of umbrella bamboo may be as long as 110 years, or more.

## References

- Campbell, J.J.N. 1985. **Bamboo flowering patterns: a global view with special reference to East Asia.** *J. Amer. Bam. Soc.* 6:17-35.
- Ebert, W. 1996. *Fargesia murielae*. Ein gartenbambus blüht und stirbt. *Florist* 11:10-12.
- Gielis, J., Goetghebeur, P. and P. Debergh. 1999. **Physiological aspects of development and experimental reversion of flowering in *Fargesia murielae* (Poaceae:Bambusoideae).** *Syste. Georg. Pl.* 68:147-158.
- Janzen, D.H. 1976. **Why bamboos wait so long to flower?** *Ann. Rev. Ecol. Syste.* 7:347-391.
- Keng, B.J. and Z.P. Wang (Eds.) 1996. **Flora Republicae Popularis Sinicae, Thomus 9(1).** Science Press, Peking.
- Sargent, C.S. 1911. **Plantae Wilsonianae (Vol.I).** The University Press, Cambridge.
- Shannik, K. 1999. **Treat yourself to the magic of umbrella bamboo.** *East Coast Gardener* 5:1-3.
- Taylor, A.H. and Z. Qin. 1993. **Bamboo regeneration after flowering in the Wolong Giant Panda Reserve, China.** *Biol. Conserv.* 63:231-234.
- Zhu, Z. and Z. Song. 1999. **Scientific survey of Shennongjia Nature Reserve.** Forestry Publish House of China, Peking.

*Authors' addresses: Deng Lan, Library, Hubei University, Wuhan 430062, People's Republic of China; Zhao Benyuan and Zhu Zhaoquan, Shennongjia National Nature Reserve, Muyu, Hubei Province 432421, People's Republic of China.*

# SLOW LORIS (*Nycticebus bengalensis*) AND ITS CONSERVATION IN NORTHEAST INDIA

by Rekha Medhi, Dilip Chetry and P.C. Bhattacharjee

## Introduction

The eastern Himalayas has been recognized as a faunal hot spot, with a particularly wide diversity among the higher taxa. Falling within this region, northeast India also enjoys a rich faunal and floral diversity. Some species from the region are important in terms of the global conservation scenario, e.g. slow loris (*Nycticebus bengalensis*), a primate that is unique and endemic to the sub-region of the oriental realm. It is the only representative species of the Loridae family to occur in the extended parts of the Himalayas and the northeast region of India. It is also the only nocturnal primate to be found in northeast India and occurs in all seven states. The southward bend of the Brahmaputra River at about 26°N, 90°E is the northwestern limit of its range. Besides India, slow loris is also found in Bangladesh, Myanmar, China, Vietnam, Thailand, Cambodia, Laos, Malaysia, Indonesia and the Philippines.

## Distribution and status

Northeast India is comprised of the seven states of Assam, Arunachal Pradesh, Meghalaya, Tripura, Nagaland, Manipur and Mizoram, with a total area of 255,088.69 km<sup>2</sup>. Together they share the highest diversity of non-human primates in the entire Indian sub-continent. The evergreen, semi-evergreen and moist deciduous forests of the region harbor 9 out of the total 15 species of non-human primates found in India. The 9 species include slow loris (*Nycticebus bengalensis*), rhesus macaque (*Macaca mulatta*), Assam macaque (*Macaca arctoides*), capped leaf monkey (*Trachypithecus pileatus*), golden langur (*Trachypithecus geei*), Phayre's leaf monkey (*Trachypithecus phayrei*) and hoolock gibbon (*Bunopithecus hoolock*). Among the primates

of northeast India, slow loris is the least studied in every aspect. There are no records about the distribution of the species in northeast India. Choudhury (1989) gave limited information on the distribution of the species. In the present study, the authors highlight the distributional status of the slow loris with an emphasis on the existing threat spectrum. The authors carried out several primate surveys in different parts of the northeastern states, both in teams and on an individual basis. Their studies covered a period of 8 years from 1995 to 2003. During this period, information on slow loris was collected along with that of other primates (Mohnot, 1995-2001; Chetry *et al.*, 2001; Chetry *et al.*, 2003; Chetry *et al.*, 2004 (in press)). The secondary information collected during these studies provides distributional records of slow loris in the region (Table 1). There are also reports of the occurrence of slow loris in other reserve forests and community forests. Every now and then, there are reports of slow loris being caught by local people collecting firewood. Most of these animals are transferred to the zoo. Data on the actual distribution and demographic status of the species in northeast India is still awaited. There have been no studies regarding its behavior and ecology.

## Threats

The study identified the following threats to slow loris, both proximally and distally.

### 1. Habitat destruction

The slow loris is distributed in tropical, moist semi-evergreen and mixed deciduous forests of the region. It is also recorded from the secondary forests in moist evergreen and semi-evergreen forest, but the indiscriminate felling



of roosting trees and feeding trees is responsible for the species' increased contact with human beings.

Tree felling is an important concern associated with habitat loss and degradation. The forest continuity does not seem sufficient to maintain the high quality of habitat for the species. The distribution of slow loris seems to be linked with the distribution of specific trees, mainly for morphological reasons, especially for the branching pattern, hiding capability, phenology and the availability of food in the nearby vicinity.

Jhum cultivation and encroachment are proximal threats faced by the species all along its distribution range in India. Jhum cultivation is the most commonly practiced method of cultivation in the hill areas of northeastern India. Due to the population explosion, the jhum cycle has been shortened from more than 10 years to less than 5 years. This reduced cycle length of jhum cultivation exerts pressure on the forests.

The practice of pan jhum (cultivation of piper through jhum) in some areas (especially southern Assam) is another factor contributing to habitat loss. Many of the illegally logged areas are subsequently encroached for settlement, permanently blocking the scope of rejuvenation of the forest.

Other human activities such as the clearing of forests for agricultural land use and the expansion of tea estates have also added to the habitat loss.

## 2. *Hunting*

Some tribes hunt the slow loris in the belief that it has medicinal value. For example, it is believed that taking the eyeball of the slow loris will help the person develop good eyesight. There are occasional reports of the smuggling of slow loris in the border areas.

Lack of knowledge among the local people is a major hindrance in the conservation of the species.

## **Discussion**

The slow loris is the sole representative of nocturnal primates in northeast India. It is a Schedule-I species in the Indian Wildlife (Protection) Act, 1972 and is listed in Appendix-II of CITES. In IUCN's Red Data List, it is a data-deficient species.

The slow loris is a neglected species and no conservation efforts have been made for the specific conservation of this species. The list of threats, from habitat shrinkage to hunting, indicates that the species needs an immediate conservation management program to ensure its existence and survival. The problem of habitat destruction needs urgent attention because habitat change has serious implications for the life history of primates (Borries *et al.*, 1991; Dunbar, 1988), which in turn affects the species' status and distribution (Bernstein & Gordon, 1974; Hill & Bernstein, 1969). However, the development of any conservation program needs an overall idea of the demography and distribution status of the animal, and this is still lacking for the slow loris. Therefore, against the current background, it is felt that the following points should be considered for the conservation of the species:

- Launching a study to work out its current demography and distribution
- Identification of the forest pockets which are the strongholds of the species
- Bringing the remaining habitat under the protection network wherever feasible
- Strict measures to prohibit the illegal capture and trade in cross border areas
- A general awareness drive should be initiated to focus on the species in the entire region
- Proper rehabilitation of the species should be developed for the rescued individuals from different areas.

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## References

Bernstein, I.S. and T.P. Gordon. 1974. **The function of aggression in primate societies.** *American Scientist* 62:304-311.

Borries, C., Sommer, V. and A. Srivastava. 1992. **Dominance age and reproductive success in free-ranging Hanuman langurs (*Presbytis entellus*).** *Int. J. Primatol.* 12:231-258.

Chetry, D., Medhi, R., Biswas, J., Das, D. and P.C. Bhattacharjee. 2003. **A survey of non-human primates in the Namdapha National Park, Arunachal Pradesh (India).** *Int. Jour. of Primatol.* Vo.24, No.2, pp.383-388.

Chetry, D., Medhi, R., Bujarbarua, P. and P.C. Bhattacharjee. 2001. **Mammals of Gibbon Wildlife Sanctuary, Assam, India.** *Tigerpaper* 28(4):29-32.

Chetry, D., Medhi, R., Das, D. Saikia, U., Das, A., Medhi, N., Choudhury, B.

Bhattacharjee, P.C. and S.M. Mohnot. 2004. **Primate diversity in the Pakke Tiger Reserve in the state of Arunachal Pradesh, India.** *Primate Conservation*. (communication).

Choudhury, A.U. 1989. **Primates of Assam: their distribution, habitat and status.** Unpubl. Ph.D. thesis, Gauhati University, Guwahati.

Dunbar, R.I.M. 1988. **Primates Social System.** Chapman and Hall, London. 1-373.

Hill, W.C. Osman and I.S. Bernstein. 1969. **On the morphology, behaviour and systematic status of the Assam macaque (*Macaca assamensis* McClelland 1839).** *Primates* (Imuyama) 10: 1-17.

Mohnot, S.M. 1995-2001. **Indo-US Primate Project Reports. Year 01:1995, pp.1-23; Year 02:1996, pp.1-16; Year 03:1997, pp.1-24; Year 04:1998, pp.1-40; Year 05:1999, pp.1-69; Year 06:2000, pp.1-86; Year 07:2001, pp.1-102.**

*Authors' addresses: Rekha Medhi, Animal Ecology and Wildlife Biology Laboratory, Department of Zoology, Gauhati University, Guwahati – 781014, Assam India, E-mail: medhirekha@rediffmail.com; Dilip Chetry, Primate Research Centre, Northeast Centre, Guwahati, Assam, India; P.C. Bhattacharjee, Department of Zoology, J.N. College, Boko, Kamrup, Assam, India.*

**Table 1: Distributional records of slow loris in northeast India**

No.	State	Forest	Area (ha)
1	Arunachal Pradesh	Itanagar WLS	14,030
2	“	Mehao WLS	28,100
3	“	Namdapha NP	198,523
4	“	Pakhui TR	86,195
5	Assam	Chakrashila WLS	4,546
6	“	Dibru-Saikhowa NP	34,000

7	“	Gibbon WLS	2,098
8	“	Kaziranga NP	47,171
9	“	Pabitora WLS	3,881
10	“	Podumoni-Borajan-Bherjan WLS	7.21
11	“	Longtingmupa	49,335
12	“	Amreng	5,695
13	“	Rani RF	4,369
14	“	Garbhanga RF	18,861
15	“	Joypur RF	10,869
16	“	Doomdooma RF	2,880
17	“	Dangari RF	919
18	“	Kakojan RF	2,345
19	“	Innerline RF	11,396
20	Meghalaya	Balpakram NP	22,000
21	“	Nokrek NP	4,748
22	“	Siju WLS	518
23	“	Songsek Tasek RF	2,331
24	Mizoram	Dampa NP	50,000
25	“	Nengpui WLS	11,000
26	Tripura	Sepahijala WLS	1,853

Note: NP=National Park; WLS=Wildlife Sanctuary; TR=Tiger Reserve

## STATUS OF INDIAN PANGOLIN (*Manis crassicaudata*) IN THE ARID PART OF THAR DESERT OF RAJASTHAN

*by Sumit Dookia and G.R. Jakher*

The Indian pangolin (*Manis crassicaudata* Gray), commonly called the Scaly anteater, is an endemic mammal of the Old World and inhabits the plains and lower slopes of the hills of India, south of the Himalayas and Sri Lanka (Prater, 1971). However, sightings of this animal in the arid tract of the Thar Desert beyond Aravallis confirm an extended range. In the Thar Desert of Rajasthan it has been reported four times from different localities during the last fifty years. The first sighting was reported by the late Dr. I. Prakash in 1955

from Sardarshar Tehsil of Churu district. It was next reported in 1995 from Merta Tehsil of Nagaur District (Dr. B.R. Dookia, pers. comm.). The third reported sighting came in August 1998 from Jaisalsar Village of Nokha Tehsil, Bikaner District (Rajasthan Patrika, August 25, 1998). And most recently it was reported on July 19, 2002 by villagers (and identified by the authors) from Ghodaran Village of Nagaur Tehsil, Nagaur District. Four animals were captured and subsequently killed by villagers due to its peculiar body

structure and lack of knowledge. Measurements of one of the animals were as follows:

Total body length: 112 cm  
Length of head: 11 cm  
Length of tail: 47 cm  
Length of forelimb: 7.5 cm + 6 cm (claw)  
Length of hindlimb: 10 cm + 2 cm (claw)  
Sex: Female

These body measurements were in confirmation with Prater (1971), Roberts (1997), Yahya (2001), Sharma (2002), Verma and Singh (2002) and Prakash (1994).

In the Thar Desert, sightings of this animal are very rare, and as it is somewhat curious in appearance, when the local people do see it they may kill it out of ignorance. In other parts of the country pangolins are poached/traded for their scales, which are used in traditional medicine, as magical charms to bring good luck, and as a curative for various ailments (Mitra, 1998). No incidences of poaching for the scales was reported from the Thar Desert because all killings were due to lack of knowledge.

Although sightings of the Indian pangolin have been reported for a long time, the present distributional range in the Thar Desert, its ecology, food and feeding habits are not known. Therefore, a detailed survey must be carried out to determine the status of this peculiar animal in this desert habitat.

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#### **References**

- Mitra, Sangita. 1998. **On the scales of the Scaly anteater *Manis crassicaudata*. *J. Bombay Nat. Hist. Soc.* 95(3):495-497.**
- Prakash, I. 1994. **Mammals of the Thar Desert.** Scientific Publishers, Jodhpur (Rajasthan). 114 pp.
- Prater, S.H. 1971. **The book of Indian animals** (3<sup>rd</sup> Ed.) Bombay Natural History Society, Bombay.
- Roberts, T.J. 1977. **The mammals of Pakistan.** Ernest. Benn, Ltd., London. 361 pp.
- Sharma, S.K. 2002. **Abnormal weight and length of the Indian Pangolin *Manis crassicaudata* Gray, 1827, from Sirohi District, Rajasthan. *J. Bombay Nat. Hist. Soc.* 99(1):103.**
- Verma, A.K. and G. Singh. 2002. **Status of the Indian Pangolin (*Manis crassicaudata* Gray) in Jammu Shiwaliks (Jammu and Kashmir), India. *Tigerpaper* 29(3):4-6.**
- Yahya, H.S.A. 2001. **Occurrence of Indian Pangolin *Manis crassicaudata* in Aligarh, Uttar Pradesh. *J. Bombay Nat. Hist. Soc.* 98(2):272.**

*Authors' addresses: Dr. Sumit Dookia, RA, Tiger Project, Wildlife Institute of India, Chandrabani, Post Box 18, Dehradun – 248001, India; G.R. Jakher, Dept. of Zoology, J.N.V. University, Jodhpur – 342005, Rajasthan, India.*

# PRESENT CONSERVATION AND MANAGEMENT STATUS OF PROTECTED AREAS IN BANGLADESH

*by Md. Qumruzzaman Chowdhury*

## Introduction

Bangladesh is part of the Indo-Malayan realm on the sub-continent of Asia, and contains a good number of natural areas that could be managed as protected areas in conformity with the international norms advocated by the World Conservation Union (IUCN). The country has 2.63 million ha of forestland, which covers 18% of the total landmass (Rahman *et al.*, 2000). Around 1.52% of the country's total land area, or approximately 14.5% of the forestland managed by the Forest Department, have been notified as protected areas. In addition, another 12,905 ha of land have been established and maintained as protected areas for the preservation of biological diversity by the Forest Department. IUCN enjoins all countries that have a number of protected areas to adopt a national system of protected areas. It can be linked to an international or regional network of protected areas, such as the South Asian regional network, primarily for *in situ* conservation of species and ecosystems (Bari, 1996). As part

of a regional network, these protected areas contain and shall preserve the important natural areas of the region. These protected areas are established to be preserved and to provide long-term services and maintain the ecological balance.

## Protected areas of Bangladesh

Presently, around 224,898 ha, or 1.52% of the country, has been notified as protected areas, which is 14.5% of the country's land that is managed by the Forest Department. These protected areas fall within four different ecosystems, namely: a) mangrove; b) hill; c) plain land forest; and d) wetlands. A summary of the notified protected areas is given in Table 1.

In addition, one national park, three wildlife sanctuaries and two wetland nature reserves have been proposed and maintained as such by the Forest Department for the preservation of habitat, flora and fauna.

**Table 1: Summary of the protected areas of Bangladesh**

Map ref.	National/International designation and Name of area	IUCN management category	Latitude/Longitude	Area (ha)	Year notified
	<i>World Heritage Sites</i>				
1	Sundarbans East Wildlife Sanctuary	X	21°51'N/89°45'E	31,226	1977/1996
2	Sundarbans South Wildlife Sanctuary	X	21°48'N/89°23'E	36970	1977/1966
3	Sundarbans West Wildlife Sanctuary	X	21°4'N/89°13'E	7,150	1977/1966
	<i>National Parks</i>				
4	Himchari	V	21°21'N/92°2'E	1,729	1980
5	Bhawal	V	24°06'N/90°23'E	5,022	1982
6	Madhupur	V	24°42'N/90°03'E	8,436	1982
7	Lawachara	V	24°31'N/91°52'E	1,250	1996

8	Kaptai	V	20°30'N/90°17'E	5,465	1999
	<i>Wildlife Sanctuaries</i>				
9	Rema-Kalenga	IV	24°06'N/91°37'E	1,795	1981/1996
10	Char Kukri-Mukri	IV	21°55'N/90°38'E	40	1981
11	Pablakhali	IV	23°11'N/92°17'E	42,087	1982
12	Chunati	IV	21°54'N/92°08'E	7,761	1986
	<i>Game Reserve</i>				
13	Teknaf	VIII	21°04'N/92°10'E	1,161	1983
<b>Total</b>				224,898	

Source: FMP, 1993

### Institutional arrangements

All notified protected areas have been established within Reserved Forests, which are managed and administered by the Forest Department. The Forest Department, therefore, has the statutory responsibility to conserve the biological diversity, wildlife and wetlands of the country. For the management of wildlife in the country, a Wildlife Advisory Board, headed by the Minister for Environment and Forest as Chairman, has been constituted under the provisions of the Bangladesh Wildlife (Preservation) Order, 1973 (President's Order No.23 of 1973). The main function of the Board is to advise the Government on any matters relating to the preservation, conservation, protection and management of wildlife in the country.

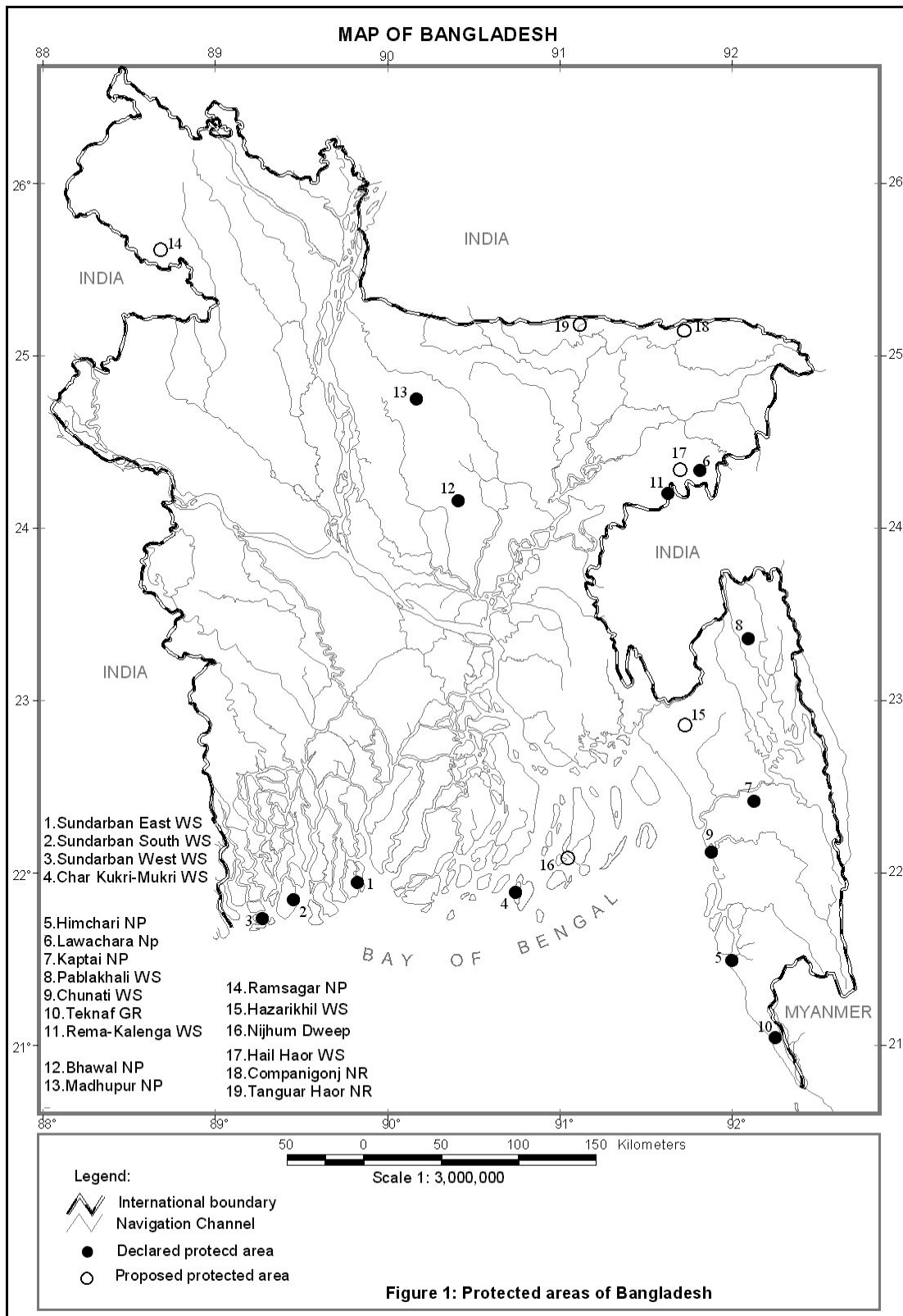
A separate wildlife circle within the Forest Department, with specific responsibility for wildlife management, was created and was headed by a Conservator of Forests for 10 years (from mid-1973 to June 1983). Under this system, except for simple protection, practically no scientific wildlife management activities were carried out in the country. In July 1983, all 112 employees of the circle were posted in the 12 territorial forest divisions having protected areas within their jurisdiction. But there was still a Conservator of Forests as a staff officer to the Chief Conservator of Forests until June 1993.

In its seventh meeting, held in 1985, the Wildlife Advisory Board advised the

Government to revive and strengthen the abolished wildlife circle. Accordingly, the Government constituted a "Wildlife Task Force" to study and recommend actions to improve wildlife management systems in the country. The task force recommended immediate revival and strengthening of the wildlife circle and submitted a report to the Government in June 1986 (Sarker, 1989); however, the wildlife circle was not revived until 1993. This indicates that insufficient attention was given to the area of wildlife management

In 1993, the "Development of Wildlife Conservation and Management Project" was put into operation by including the post of Conservator of Forests, Wildlife Circle. This ceased functioning at the completion of the project in June 1997. Currently, protected area-related functions are carried out by the Divisional Forest Officers (DFOs). In addition to the creation of two Environment Management Divisions, one at Chittagong and the other at Khulna under the Forest Resources Management Project (1993-94 to 2001-2002), two DFOs under the Territorial Conservators of Forests are carrying out some of the activities of protected area management.

Under the present organizational set-up of the Forest Department, approved by the Government in January 2001, a new Wildlife and Nature Conservation Circle, to be headed by a Conservator of Forests, was also created.



Under this Circle, there are four Wildlife Management and Nature Conservation Divisions located at the Divisional Headquarters in Sylhet, Dhaka, Khulna and Chittagong administrative districts. The respective DFOs are responsible for the protected areas located in these divisions.

### **Existing legislation and policies**

The conversion of marshes and other wetlands to agricultural fields should be reconsidered. Plans to develop an ecologically viable and socio-economically acceptable system of management for the preservation of wildlife and fishery resources utilized the National Conservation Strategy of 1995. Some widely distributed wetland areas should be declared as protected areas for the safe refuge and propagation of wildlife (NCS, 1991). Bans (embargos) have been imposed on the hunting and capture of wild animals. To conserve the natural forest, a moratorium on logging has been imposed in all forests of the country since October 1989. Exceptions have been made in the case of collection of raw materials for industries.

The Bangladesh Environment Policy (1992) has given due importance to the conservation of nature and biodiversity, along with the conservation of the country's forests and environment. Forest extension activities through participatory approaches also gained support in the national policy.

The National Environment Management Plan (NEMAP), completed in 1994, is an environmental planning exercise of the Government that was carried out by the Ministry of Environment and Forest (MOEF) with the assistance of the United Nations Development Programme (UNDP). The NEMAP focuses on identifying key environmental issues to conserve and improve the environment. The NEMAP participatory process recognizes the need to develop and understand charland (newly formed land), the Barind Tract (772,800 ha), coastal zones and wetlands ecosystems. It recommends

afforestation to compensate deforestation and combat desertification in the Barind Tract. Declaration of protected areas in potential coastal areas and determining the requirements for wetland management policy and planning are also envisaged (MOEF, 1995).

The National Forest Policy adopted in 1994 decided to increase the protected areas by 10% of the reserved forestland by the year 2015. Accordingly, the Government has been expanding the area of existing protected areas and declaring new protected areas. However, protected areas have been declared only in the Reserved Forests, which are under the control of the Forest Department. Due to multi-sectoral linkages and other obvious reasons, it is often difficult to declare ecologically vulnerable areas such as coastal zones, the Barind Tract, wetlands or coral islands as protected areas, as they are beyond the scope of the Forest Department. A draft bill has been prepared by MOEF called the "Bangladesh Protected Area Management and Wildlife Act," which will include provisions for the protection, preservation and conservation of the protected areas.

### **Recent management plans for protected areas**

Conservation management plans for the 13 aforementioned protected areas were recently prepared with the assistance of the World Bank under a project called the "Forest Resources Management Project (FRMP)". In the meantime, the Government has already approved the management plan for the Sundarbans, which provides a number of strategies for solving some of the major issues that have been identified, including: a) important genetic resources and biodiversity protection and preservation; b) enhancement of habitat quality and productivity; c) enhancement of outdoor recreation and eco-tourism values; d) safety of personnel inside the protected areas; e) interests, rights and concerns of people living inside the protected areas; and f) effective tools for project implementation, monitoring and evaluation.



**Table 2: Expanding protected areas coverage in Bangladesh**

Protected Area	Original Area (ha.)	Year	Extended Area (ha)	Year
Kaptai National Park (formerly Rampahar -Sitapahar Wildlife Sanctuary	3,026	1973	5,645	1999
Rema-Kalenga Wildlife Sanctuary	1,095	1981	1,795	1996
Sundarban East Wildlife Sanctuary	2,100	1977	31,226.938	1996
Sundarban West Wildlife Sanctuary	69,000	1977	71,502.103	1996
Sundarban South Wildlife Sanctuary	35,000	1977	36,970.455	1996

Source: FMP, 1993

The basic concept in this conservation management plan embodies management zones and buffer zones. But the new management plan for the protected areas further include strict protection zones, rehabilitation zones, multiple-use zones, recreational zones, special use zones and buffer zones.

### **Global initiatives and Bangladesh perspectives**

IUCN has recommended categorizing protected areas into distinct biogeographic zones as a preliminary step in management (Rosario, 1997a). Under this approach, protected areas in Bangladesh can be divided into four biogeographical zones with distinct floral, faunal and habitat characteristics. Within each zone, 10 functional categories are also recognized, based on features such as the amount of vegetation cover and level of disturbance.

Following the appropriate categorization of the protected areas, an environmental profile will be developed to help evaluate what kind of protection is required for particular areas (Rosario, 1997c). In addition to the biogeographic zoning approach, the ecosystem-cum-species management approach has been recommended. This approach provides special protection for the prominent species that are under threat in Bangladesh, such as Bengal tiger, Asian elephant, crocodiles, sea turtles and a range of bird species.

A rather important aspect of nature conservation is the enforcement of laws and

regulations regarding wildlife and forest resources utilization. An examination of the existing laws (e.g. Bangladesh Wildlife Preservation Amendment Act, 1973) shows that they are seriously flawed and may actually assist poachers to escape punishment (Das and Siddique, 1985). These laws need to be revised and specific applications involving important species should be incorporated. Protection operations in most of the protected areas are seriously hindered by the lack of staff, communication equipment, infrastructure, training, mobility and field allowance. There is an urgent need for capacity building to overcome these obstacles to sound and sustainable management.

It is necessary to manage the protected areas by a participatory approach, which, however, is progressing very slowly in Bangladesh. The primary stakeholders – poor people living in or on the fringes of protected areas – need to be educated through awareness programs. Furthermore, they should be involved in the management activities through consultations in decision-making and employment to allow their sustained participation (Rosario, 1997b). Integrated management plans seem to be the most useful way of linking different organizations, governing bodies and stakeholders to protect nature on a sustainable basis. They encompass four functional units, namely: liaison, revenue, administration and database (Bari, 1996). These units link with another four units consisting of forest, aquatic resources, wildlife resources and eco-tourism, to allow the exchange of ideas and information that will lead to the smooth management of the Sundarbans. The proposal is under consideration. Similar integrated management

plans are being prepared for other protected areas and ecologically critical areas (e.g. Tanguar Haor Management Plan, 2000) in Bangladesh.

There is no national wildlife conservation policy in this country. The Bangladesh Wildlife (Preservation) Order, 1973 (President's Order No.23 of 1973) (amended in 1973 and 1974) provides for the establishment of protected areas such as national parks, wildlife sanctuaries and game reserves. There is also the Private Forest Ordinance, 1959 (E.P. Ordinance No.XXXIV of 1959), which details rules for hunting, shooting and fishing within the controlled and vested forests. Other wildlife protection acts include: the Wild Birds and Animals Protection Act, 1912; the Preservation of Wild Elephants, 1879; and the Bengal Rhinoceros Preservation Act, 1932. The Bangladesh Environment Conservation Act, 1995 mainly addresses the existing environmental issues. If the environmental degradation of any area/ecosystem reaches a critical state, the Government can declare the area as an Ecologically Critical Area (ECA) under the provisions of this Act.

### Recommendations and conclusions

The planning strategies for the development of protected areas should be continually evolving, keeping in view the national needs and priorities, site requirements and the participation of local communities and NGOs. Potential wetlands, coastal zones and the Barind Tracts should be declared as protected areas on a priority basis and their conservation must be ensured. Environmental mitigation components should be made part of all development projects. Appropriate institutional frameworks should be developed and eco-tourism needs to be promoted. After reviewing the current status of the protected areas, the following recommendations are made with a view towards better management practices:

- Involve all agencies to promote protected area management with total coordination.
- Review national and other conservation legislation for appropriateness, flexibility and ease of implementation and the

potential to enable participation of the local communities.

- Encourage the preparation of innovative management plans that reflect both the conservation values of the protected area as well as the socio-economic concerns of local communities and their participation.
- Buffer zones have to be developed to protect the core zone with a participatory approach.
- Explore the need for restructuring management authorities to meet new challenges.
- Generate wildlife databases for protected areas and share them with researchers across the region.
- Generate income from internal sources, such as by adopting a realistic pricing structure for eco-tourism activities in protected areas.
- Develop a mechanism to apportion a reasonable percentage of tourism revenues and returns from other sources related to the existence of the protected area. These revenues may be used for the management of the protected area itself and ensure the sharing of such revenue with the local communities in the case of protected areas developed under a collaborative management system.
- Provide training in protected area management, both on-site and at specialized training institutions within the region and elsewhere.
- Involve local communities in local institutions, and when possible use existing institutions rather than create new ones.

### References

- Bari, A. 1996. **Towards sustainable development: The National Conservation Strategy (NCS) of Bangladesh.** NCS Implementation Project, Consultancy Report for Forestry Sub-sector, Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, Dhaka.
- Das, S. and N. Siddique. 1985. **The Mangrove Forest of Bangladesh.** *Bangladesh Forest Research Institute and Mangrove Silviculture Division, Bulletin No.2*

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# Forest News

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## ***FOREST CERTIFICATION IN CHINA: LATEST DEVELOPMENTS AND FUTURE STRATEGIES***

### **Background**

China is one of the world's largest wood producing countries. It has also become one of the world's largest importers and exporters of forest products. Over the past decade, China has invested in a number of large processing facilities. Significant quantities of all kinds of wood products are currently being produced and China has quickly become a leading producer of value-added wood products for export. Certification is an increasingly important issue for China, with a view toward maintaining and increasing its market share, particularly in Europe and North America.

Over the past decade there has been a proliferation of certification schemes in different countries and regions and at different levels. China is interested in developing a single, coherent national forest certification strategy, building on the experiences of other certification schemes.

To facilitate this objective, the State Forest Administration (SFA) of China invited FAO's assistance in organizing the workshop: *Forest certification in China: Latest developments and future strategies*. The workshop was organized in collaboration with SFA, the USDA Forest Service, and the Zhejiang Forestry Department (ZFD). The workshop, which was held in Hangzhou, China, 21-23 July 2004, examined the most recent developments in forest

certification from a range of perspectives, both at international and national levels.

The main objective was to provide the Chinese and regional participants with an overview of the various certification alternatives. Secondary objectives were to:

- facilitate the exchange of information on certification issues among participants from throughout the region;
- provide a comprehensive overview of the certification initiatives at national and international levels;
- identify the advantages and disadvantages of certification;
- identify and discuss concerns and constraints related to the development of a Chinese national certification standard; and
- explore the options for establishing a national certification initiative in China.

### **Presentations**

Presentations were made on the following issues: certification schemes (both international and national); mutual recognition; market analysis; and development of a national certification standard. The presentations were followed by group work and the workshop concluded with a panel discussion.

Representatives of the Programme for Endorsement of Forest Certification schemes

(PEFC) and the Forest Stewardship Council (FSC) explained how their certification schemes work and the potential relevance to China. There are several fundamental differences in approach and institutional arrangements between PEFC and FSC. However, they both provide an umbrella structure for schemes and initiatives that operate at national levels. With PEFC, a national certification scheme is developed, whereas with FSC's scheme, a national certification standard is developed on the basis of the global FSC certification standard, although there are some exceptions to this general approach (such as the UK Woodland Assurance Standard, UKWAS). Both certification schemes could provide China with options for international recognition of a Chinese certification standard.

Presentations were also given by representatives of the Malaysian Criteria & Indicators (MC&I), Lembaga Ekolabel Indonesia (LEI) and the Sustainable Forestry Initiative (SFI), from North America. Each presenter provided information on the development process of each scheme, experiences in implementing the scheme and how they have dealt with the issue of labels in the international markets. Valuable lessons can be learnt from the experiences of these countries in the development of national certification schemes. Both MC&I and LEI have worked with FSC to obtain FSC endorsement. MC&I also has become a member of PEFC and is considering submitting its certification scheme for assessment by PEFC. SFI is currently a member of PEFC and is considering submitting its scheme for assessment by PEFC.

The UK Woodland Assurance Scheme (UKWAS) was presented as an example of how a national certification standard could be developed with the consensus of all the relevant forestry stakeholders. This was a unique process, and the standard developed has since been accepted by both FSC and PEFC.

The proliferation of certification schemes has led to numerous calls for formal recognition among the certification schemes on an international level, through so-called "mutual recognition." To date, discussions on this issue have often been antagonistic and polarized, and

have not succeeded in achieving overall mutual recognition. Currently, most experts acknowledge that mutual recognition will be difficult to achieve and, hence, it is not being actively pursued for the time being.

An analysis of international markets indicates that Europe and North America currently represent the most important markets for certified timber products. At present, the most important factors driving forest certification tend to be environmental image (of corporations and countries) and market access (maintenance and increase of market share). Despite initial expectations and promises of "green premiums" for certified products, consumers are reluctant to actually pay extra for certified products, except for certain niche products (e.g. high-value furniture, or musical instruments).

Analysis of the Chinese timber market indicates that demand for timber is increasing rapidly, while at the same time domestic timber production is decreasing (largely as a result of the Natural Forest Protection Programme that restricts logging in much of the country). This has resulted in a large increase of imports, making China one of the largest importers of timber in the world. China has a rapidly expanding industry for value-added products and is a large exporter of products such as plywood, furniture, etc. The main export markets include the United States, Japan, Korea and the United Kingdom. Certified products would be of particular interest to the U.S. and the U.K. markets.

Despite being in the early stages of developing a national certification standard, China has made considerable progress. A draft version of the Chinese standard was presented at the workshop, which consists of 9 principles, 45 criteria and 118 indicators. This standard has mainly been based on the generic FSC standard and the ISO 14001 EMS standard.

Three discussion groups (two for the Chinese participants and one for the international participants) gave the workshop participants an opportunity to explore certification issues more thoroughly. The two Chinese discussion groups considered options for further developing a national forest certification scheme for China.

Issues that were discussed included: who should be involved, what issues still need to be resolved, how to attain international recognition for the certification scheme, etc. Participants in the international group discussed certification developments in their own countries and made observations and suggestions on the China situation.

### **Observations and suggestions for China**

The group of international participants made the following observations and suggestions for China:

- China's efforts to develop a national forest certification standard were applauded.
- It was suggested that that China use its influence on the international timber market wisely, especially with regard to buying timber from other countries. While China will be able to improve domestic forest management through forest certification, it can also have a major influence on the countries from which they import their

timber, by being sensitive to the legality of purchased timber and the sustainability of harvests.

- It was recommended that China establish a regulatory body for monitoring the source of imported logs, some of which currently come from countries with problems related to the legality of the source.
- The importance of the government in developing forest certification was recognized; however, it was recommended that China provide mechanisms and encourage broader stakeholder participation in the process.
- By considering other products such as bamboo and forest food in its certification scheme, China is addressing important aspects of forestry in the country and pioneering new ideas that will be relevant for other countries as well.
- Certification will have several long-term benefits for China, including improving the environmental image of the country.

## ***URGENTLY NEEDED: PROPER PLANNING FOR EFFECTIVE TRAINING IN FOREST HARVESTING***

*“The most critical single requirement for the successful application of reduced impact logging (RIL) on a wide scale in tropical forests is the availability of skilled logging personnel at all levels. The fact that almost no tropical countries presently offer such training effectively dooms their forests to poor logging practices.”* This stark observation was made by Dennis Dykstra in a key presentation made at the 2001 International Conference on the Application of Reduced Impact Logging to Advance Sustainable Forest Management in Kuching, Malaysia.<sup>1</sup> Others have maintained that strong

political commitment is needed first and foremost before we can see substantial improvements in forest harvesting. Notwithstanding the different views on what is most urgently required, there is broad agreement that currently the workforce involved in forest harvesting is inadequately prepared to make the changes essential for reaching the elusive goal of sustainable forest management.

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*logging to advance sustainable forest management*, eds. Enters, T., Durst, P.D., Applegate, G., Kho, P.C.S. and Man, G. RAP Publication 2002/14. Food and Agriculture Organization of the United Nations, Bangkok. pp. 303-311.

<sup>1</sup> Dykstra, D.P. 2002. Reduced impact logging: concepts and issues. In: *Applying reduced impact*

If you re-read Dykstra's claim carefully, you will note that the problem is at least two-dimensional in nature. First, the workforce lacks the essential skills to adopt reduced impact logging. Second, hardly any country in the tropical world is in the position to deliver training effectively.

In fact, Dykstra possibly underestimates the magnitude of the current problem, which is of an even more fundamental nature. Most training in forest harvesting addresses problems related to weak skills. Some are devoted to correcting a lack of knowledge or poor understanding. Virtually none, however, is directed at indispensable attitudinal changes. Other reasons why people do not perform in a desirable manner, such as motivational or organizational issues, are also not addressed adequately. In addition, training needs analyses are rarely conducted properly. This is in part because experts involved in training all too often feel that they know what is needed without even meeting with employees in the forest or office. As a result, many training courses and programmes that do exist have little impact. They often address perceived—but not real—problems.

What guarantee is there that forest operators—whether loggers, supervisors or managers—will actually make use of the knowledge they acquire or the skills they are taught? Hardly any, so long as formal training is not preceded by proper planning and so long as training efforts are measured according to the number of courses offered and number of participants, rather than in terms of increasing competency levels and real behavioral changes.

Training in forest harvesting—as well as many other fields—is an educational process that requires more than just distributing information and developing or strengthening skills. Providing training to adults—especially forest operators—at the workplace is very different from teaching children in the class room. Trainers need to have a good understanding of their clients—the trainees—and their reasons for participating in any course. Above all, effective training requires trainers to have a thorough

understanding of the training process and the role and value of systematic planning.

In the first instance, the need is not for more training, but instead on sensitizing trainers to the qualitative aspects of training such as appropriate training content, instructional techniques and teaching materials. A step-wise and systematic planning process for designing a training course or whole programme is called *training curriculum development*.

Planning for effective training or curriculum development was the main subject of a recent workshop organized by FAO in collaboration with the Forest Department Peninsular Malaysia, under the regional project *Enhancing sustainable forest harvesting in Asia*. The workshop was held in the State of Terengganu, 20-23 September 2004, with an additional day spent at the Forestry Training Unit in Kepong, Kuala Lumpur. Nineteen participants from five countries attended the workshop, with the main objective to provide information on how to plan and design an educationally-sound training activity.

The workshop illustrated simple, yet useful, tools to develop a training curriculum based on trainees' needs and existing competencies. It also emphasized the need to assess the training process to ensure the relevance and appropriateness of a training programme or course. Finally, the workshop indicated to the participants that the careful design and preparation of training is a major activity that usually consumes more time and energy than the actual delivery of training.

Resource persons repeatedly stressed that if the planning phase is underestimated, training success may be severely jeopardized, as trainees may not benefit from the training, do not feel inclined to make use of the new knowledge or skills that they have acquired, or see no need to change their attitudes and behavior.

As the topic of the workshop, *Planning for effective training*, is important not only for the selected few who were able to participate in the workshop, but also for a wider audience, the

main steps of curriculum development are summarized below.<sup>2</sup> The basic steps of the curriculum development include the following:

1. Identify the participants and set a date and location for the training course.
2. Determine training needs.
3. Set training objectives.
4. Prepare and organize training content.
5. Select training methods and techniques.
6. Prepare the lessons plan and training materials.
7. Develop an evaluation strategy.

In the first step, planners need to clearly ascertain who the trainees are. Forest harvesting—including conventional and reduced impact logging—consists of numerous tasks that are often performed by different workers or employees. Although people usually talk casually about logging, a “logger” as such, basically does not exist. A variety of people are involved in harvesting operations and they all need different knowledge and skills appropriate for the tasks they perform. Consequently, trainers need to recognize the differing training needs of the different groups.

Trainers also need to ascertain the approximate number of participants—avoiding attempts to train too many people at once. Another important consideration is the best time of the year for training—which does not mean the time most suitable for the trainers, but rather the most fitting for the trainees.

Finally, the location for training needs to be determined. Generally, it is more effective to provide training in the field—in the area where logging takes place—rather than at a central location. The Forestry Training Center in Terengganu operates a mobile training unit, which enables training, especially in directional felling, as close as possible to the work site. The Sarawak Timber Association operates its training programme for tree fellers and tractor drivers in a similar fashion.

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<sup>2</sup> Detailed guidance on curriculum development is available in FAO. 1993. *Planning for effective training*. Rome, Food and Agriculture Organization of the United Nations.

The most effective way to determine the relevance of training content (i.e. subject matter or topics) is to conduct a needs analysis, which determines whether there is a discrepancy between the desired and actual performance of trainees. All too often it is assumed that trainees know next to nothing and valuable resources are wasted by telling them what they already know. Also, sometimes people are taught skills that they do not need in their jobs. Proper training needs analyses help to avoid such mistakes, which can easily lead to discontented trainees.

Once training needs are clarified, they need to be translated into appropriate objectives. Objectives provide trainees with a clear understanding of what they will be expected to do as a result of the training. A performance objective, for example, may state that upon completion of the course the tree fellers will be able to fell a tree in a predetermined direction with an error margin of +/- 20 percent. Objectives also help both trainers and trainees evaluate the learning that has taken place through instruction. For instance, in the directional felling example, if the error margin is consistently above 20 percent, then the trainee has not learned sufficiently and is not competent in directional tree felling.

The established objectives basically determine the content of the training. If the broad objective is to implement a code of practice for forest harvesting, for example, then the following topics would have to be included in a training programme:

- pre-harvest inventory and mapping of individual crop trees;
- pre-harvest planning of roads, skid trails, and landings;
- vine cutting;
- controlled felling and bucking techniques;
- construction of roads, landings, and skid trails;
- log extraction; and
- post-harvest assessments.

Currently, the most common training methods are lectures and assigned readings. These can be effective for a particular audience, such as university students or academics, and if the objective is to transfer knowledge. Imagine,



however, a lecture on directional tree felling or chainsaw maintenance. Such an approach would be highly unproductive. Not only are tree fellers and many other forest operators not accustomed to sitting in lecture halls, upgrading skills is much better done in the forest through demonstrations. Case studies, role plays, discussion groups and field visits are all methods that can be used more effectively. They all have their advantages and disadvantages, underscoring the importance of selecting methods with great care.

The same is true for the preparation of training materials. Hand-outs and manuals are common, but they are only the most prominent types of printed materials. Others include workbooks, magazines, assignment sheets, study guides and pamphlets. Audio-visual teaching aides, such as videotapes, flipcharts, slides and overheads are also important tools. It is important to remember that a mix of materials makes training more interesting and increases the retention of information.

At this point, all of the previous decisions and efforts are pulled together into lesson plans, which serve as a written record of how the training will be conducted. Lesson plans provide information on: course topics; training methods; duration; and needed resources.

Lesson plans also help the trainer to stay on course with the training. Without a plan, the

training may become very disorganized and lead to the dissatisfaction of trainees.

Setting out an evaluation strategy is the final step of the curriculum development process. It is considerably more difficult to measure actual learning that takes place than to determine what trainees think about the training and trainers. While the latter is important too, more important is to measure progress and to know how much trainees are learning during the course of the training and at the end. It is not sufficient to administer a test at the end of the training and provide each participant with a certificate. Trainees have to be tested at the beginning of the training and at the end, or progress cannot be measured. The final assessment determines whether trainees have the skill to perform a certain task or whether they have reached the competency to do a certain job. While most tests are written exams or performance tests that allow the measuring of knowledge and skills, observations can also be used to detect changes in attitudes and behavior.

Curriculum development provides the framework and foundation for effective training. It is a crucial ingredient to building a competent and dedicated workforce required to effectively implement codes of practice for forest harvesting and to achieve sustainable forest management. Without effective training, forests are doomed to poor logging practices and without proper planning, training will not be as effective as it should be.

It is only when the last tree has been cut  
When the last fish has been caught  
When the last river has been poisoned  
That you will realize that you cannot eat money.

*Cree Indian saying in the USA*

## **NATIONAL FOREST PROGRAMMES— SUPPORT FROM THE FACILITY**

The National Forest Programme Facility (in short, Facility) has been providing support for the development and implementation of national forest programmes (nfp) for more than two years. The number of countries benefiting from the Facility support continues to expand. Currently, the Facility is active in 36 countries in Africa, Asia and the Pacific, and Latin America, and also supports two sub-regional organizations in Central America. In the Asia-Pacific region, seven countries are partners of the Facility. Country-level support and the activities that countries have proposed are diverse. Examples include:

### *Indonesia*

The Facility is assisting in the transparent and participatory preparation of a National Forest Statement. It is hoped that the Statement will provide guidance to forestry stakeholders and replace, to a certain extent, the ever-changing *ad hoc* political decrees that have led to a considerable degree of uncertainty amongst forestry stakeholders. A first step in the preparation of the Statement is the organization of four regional workshops (Sumatra, East Java, Sulawesi and West Papua), which will provide a forum for airing and building consensus on regional forestry issues and the contribution that forestry can make to poverty reduction. To coordinate the workshops, the preparation of the Statement and other activities under the national forest programme, the Ministry of Forestry established an nfp secretariat in July 2004.

For more information on the nfp in Indonesia, please contact Ms. Dewi Febriani ([wienny2000@yahoo.com](mailto:wienny2000@yahoo.com)).

### *Philippines*

The Facility is supporting a two-pronged approach designed to increase the effectiveness of the Community-Based Forest Management (CBFM) Programme. The two cornerstones are:

- 1.) development of a CBFM Implementation Strategy; and
- 2.) strengthening capacities at different levels:
  - community (field) level;
  - institutional implementation (project) level; and
  - policy development and procedure formulation (programme) level.

Under the partnership agreement, six case studies of selected CBFM sites have been undertaken by representatives of non-government organizations and universities. The progress of the research was reviewed during a workshop in May 2004, attended by the members of the CBFM Advisory Group and representatives of NGOs, universities and research institutes. During a second consultative workshop (24-26 June 2004), the study results were presented, discussed and validated by representatives from people's organizations from Luzon, Visayas and Mindanao, NGOs, the research community, the Department of Environment and Natural Resources and the CBFM Advisory Group. Moreover, the workshop participants identified and discussed recommendations to enhance the CBFM implementation strategy. The study results and the opinions aired are currently being synthesized and will be published in the form of an overview document with unambiguous recommendations for further discussions. The document will be a major input to regional workshops that will be organized by Regional CBFM Federations in early 2005. For more information on the activities, please contact: Ms. Remy Evangelista ([cbfmpremy@edsa.com.ph](mailto:cbfmpremy@edsa.com.ph)), or you can visit the website [www.fao.org/forestry/nfp](http://www.fao.org/forestry/nfp), where you will find copies of the study reports on the *Progress* page.

### *China*

The Chinese Academy of Forestry (CAF) has taken the lead in two activities. In collaboration with the State Forestry Administration (SFA), it

is formulating a forestry sector strategy for Ningxia Hui Province. In a first step, the Research Institute of Forest Policy and Implementation of CAF is preparing five thematic papers that will provide, in a coherent and comprehensive manner, background information for the preparation of the strategy. A second agreement between the Facility and CAF covers the design of a website and communication strategy to support sustainable forest management in China. The purpose of the proposed activities is to strengthen capacities in providing information to different stakeholders at the national and international levels. The first phase of the three-year activity commenced with a multi-stakeholder workshop in August 2004. It will focus on the establishment of a framework for a website, identification of user needs, design of a website structure, training in website development and maintenance, and preparation of basic information on Chinese forestry to be uploaded in both the Chinese and English languages. For more information on the activities or on China's national forest programmes, please contact Mr. Xia Jun ([xiaj@forestry.gov.cn](mailto:xiaj@forestry.gov.cn)).

Partnerships with the Facility were launched in May 2004 in Vanuatu and in August 2004 in

Pakistan. Vanuatu has taken the first steps toward drafting a forest policy implementation strategy, while in Pakistan support will cover the establishment of a forest policy forum, or similar mechanism, for multi-stakeholder involvement in policy analysis and formulation, and the generation and dissemination of improved and up-to-date information on forestry issues. In both countries, partnerships are still in their infancy, but if the participation of stakeholders in the launching workshop is any indication, the interest is considerable.

For more information on national forest programmes in the Asia-Pacific region, and/or the National Forest Programme Facility, please contact:

*Mr. S. Appanah,*  
*NFP Advisor for Asia and the Pacific,*  
*FAO/RAP, Bangkok, Thailand.*  
*Tel: 66-2-697-4136; Fax: (66-2) 697-4445;*  
*E-mail: [simmathiri.appanah@fao.org](mailto:simmathiri.appanah@fao.org)*  
*or*

*Mr. T. Enters,*  
*NFP Facilitator,*  
*FAO/RAP, Bangkok, Thailand*  
*Tel: 66-2-697-4328; Fax: (66-2) 697-4445;*  
*E-mail: [thomas.enters@fao.org](mailto:thomas.enters@fao.org)*

## ***REVISED MASTER PLAN FOR FORESTRY DEVELOPMENT IN THE PHILIPPINES***

*by A.P. Carandang, National Project Director & CBFM Specialist*

The forestry sector is the centerpiece of the Philippines' natural ecosystems. Although the sector's productivity has been declining, its contributions to the economy in terms of added value, creation of jobs, and the provision of biomass fuels are still significant. Its continued development is a pre-requisite to sustained growth in agriculture and other industries.

However, the sector continues to reel from many threats to forest resources, among which are: tremendous pressure from an increasing population in search of land to till and forest resources to use; the loss of vital watershed functions and biodiversity; and inadequate forest development, management and conservation efforts.

In 1989-1990, the Philippine Government, with the assistance of the Asian Development Bank (ADB) and the Finnish International Development Agency (FINNIDA), formulated a 25-year Philippine Master Plan for Forestry Development (MPFD), designed to revitalize the forestry sector and bring it back to its former significant role in national development. The formulation was completed in 1992.

Since the MPFD was formulated, several new developments and concerns have emerged in forestry, both in the local and international fronts. These issues, which include forestry and land-use implications related to climate change, the increasing recognition of the role of forests and forestry in poverty eradication and support of sustainable livelihoods, etc., were not foreseen at the time the MPFD was formulated. Subsequent reviews conducted by ADB in 2000, and by the United Nations Development Programme (UNDP) in 2001, recommended the review and revision of the MPFD, taking into consideration the changed environment and priorities in the Philippines and other emerging trends in local and international forestry. In September 2002, with funding support from UNDP, a team was assembled by FAO to review and revise the 1990 MPFD. The project reviewed the MPFD implementation and accomplishments, and identified programs to improve the performance of the forestry sector.

### **General Assessment of 1990 MPFD**

One of the most visible accomplishments of the 1990 MPFD is the Community Based Fire Management (CBFM) project, which falls under the People Oriented Forestry Program. Another area where the 1990 MPFD exceeded its target is in the area of protected area and biodiversity conservation. Similarly, there are many positive developments under the program of soil conservation and watershed management.

However, in terms of other key program targets, most were under-achieved or posted no achievements at all. Among these programs are: delineation and marking of forest boundaries;

identification of production and protection forests; establishment of forest plantations; and rationalization of forestry education in the country. Apparently, the implementation of the 1990 MPFD was beset by many problems and constraints. There is a consensus among the sector stakeholders that forestry sector policies were outdated. This is compounded by the inadequacies of legal instruments and consequent weaknesses of public forest administration and management in the country. Other implementing problems included inadequate planning and programming, and funding uncertainties. Contributing to the problems was the absence of real awareness and commitment on the part of decision makers to recognize forestry as a significant economic sector.

### **Potentials and strengths of the sector**

In spite of all the constraints, forestry in the Philippines has considerable potential for contributing to the development of the country – both economically and ecologically. Several potential areas were identified, such as: i) putting all forest areas under appropriate forest management systems that seek to obtain optimum economic and environmental benefits for forest communities, other stakeholders, and society in general; ii) expanding the area under forest cover through plantation establishment, enrichment planting and assisted natural regeneration; iii) enhancing access to residual forests within production forest areas to improve the wood supply; and iv) revitalizing the forest-based industries through rationalization and appropriate incentives, improved primary and down-stream processing, and new product development. In addition, it has several significant strengths that are important and relevant to supporting sustained development of the forestry sector. These include a tradition and history of forest management; existence of a reasonable extent of natural forests available to support biodiversity and environmental objectives as well as production of goods and services, existence of sectoral institutions and a large number of well trained and committed

professions and technical personnel. Their performance can be considerably improved through retraining and refresher training.

### **The Revised Forestry Master Plan for Forestry Development**

A synthesis of the various subsectoral visions identified during several public consultations revealed some common aspirations among the stakeholders. These included participatory management of watersheds and forest resources for the common good, and the desire to be globally competitive in forest plantations and utilization. From these, a common vision for the sector has been drawn up as given below.

***Forestry Sector Vision:** Sustainably managed watershed and forest resources providing environmental and economic benefits to society with globally competitive industries contributing to the national economy and uplifting of upland communities' welfare.*

Among the general objectives formulated to pursue this vision was the sustainable management of watersheds/forests through active participation of the stakeholders, globally competitive industries, excellent forestry education and training, and enhancement of the protective values of forests and biodiversity. Overall, the vision seeks to select objectives that improve the quality of life for forest-dependent people, improve the decision making process, and enhance the effectiveness of the forestry institutions.

To enable such a vision and achieve the general objectives, the revised FMP identified strategic targets as follows:

- a fully responsive and capable public forest administration (PFA) within 10 years;
- forestry and related policies harmonized within 5 years;
- poverty in the uplands reduced by half within 15 years;

- all forestland boundaries defined and marked, production and protection forests identified, surveyed and segregated within 10 years; and
- a healthy, vigorous and responsible forest-based industry within 5 years.

Programs and actions were then formulated along the areas of policy and legislation, which were then refined into the top 10 strategic priority programs as follows:

- Policy Reforms and Institutions Development:
  - harmonization of other policies affecting the sector;
  - retrofitting the PFA as a line agency – firstly a land management agency and secondly as a forest resources management agency – with separation of the authority and enterprise functions of the PFA;
  - capacitation of forestry institutions and institutional reforms; and
  - National Council for Sustainable Forestry (NCSF).
- Prioritization of watershed integrated land use planning, simultaneous with forest boundary delineation.
- MIS, IEC and R&D enhancement.
- Sustainable management of residual forests and other natural forests, arresting forest destruction.
- Forest area expansion through plantation development, ANR and other means.
- Protected area and biodiversity conservation.
- Forest industries rationalization and development.
- Sustainable management of grazing lands.
- Full development of M&E and C&I systems for all forest types and management systems.
- CBFM as a cross cutting strategy in all forest management systems.

## **ENHANCING NETWORKING OPPORTUNITIES AMONG MODEL FORESTS**

More than 30 participants took part in a regional meeting in Lin'an City, China, to review the status of model forest development and discuss opportunities for enhancing networking among model forests in the region. The meeting, which was held 21-23 September 2004, was organized by the International Model Forest Network Secretariat (IMRNS), FAO, and the Chinese Academy of Forestry (CAF). Participants included representatives from seven model forests in Asia, the Samar Island (Philippines) Biodiversity Project, and supporting international organizations (IMFNS, FAO, IDRC, and Venture for Fund Raising). A regional workshop on strategic and operational work planning was organized prior to the network meeting for selected participants.

### **Update on model forest activities in Asia**

Progress has been positive at all of the model forests. Partnership organizations continue to be strengthened at all the model forests and field activities have been especially impressive in model forests in China, Myanmar and the Philippines.

In addition to the four model forests initially supported under the Regional Model Forest Project, additional model forests are currently being developed in India (Kudagu) and Indonesia (Berau and Margowitan). These model forests have expressed strong interest in joining the Regional and International Model Forest Networks. Indonesia plans a formal launching of the Margowitan Model Forest in December 2004, just prior to hosting the next regional model forest workshop.

### **Opportunities for enhancing networking among model forests in Asia**

The meeting considered the benefits, costs, and various approaches for enhancing networking among the model forests in the region, based on regional experience to date, the experiences of the Canadian Model Forest Network, and FAO's experience in supporting networks over the years. Given the reduced level of international funding for model forest development in the region – at least in the near term – discussion emphasized cost-effective approaches for networking.

Various options for network management, support, and governance were discussed, as well as the need to build links between model forests and other organizations. It was suggested that a strategy for networking among the model forests in Asia be developed, and it was recommended that a small working group be established with support from IMFNS to facilitate the formulation of a draft strategy.

### **Preparations for upcoming Regional Model Forest Network Workshop on financial sustainability**

The Government of Indonesia and Perum Perhutani will host a "Regional Model Forest Network Workshop on Financial Sustainability," 6-10 December 2004. The workshop will be supported by IMFNS, FAO, IDRC, the Indonesian Ministry of Forestry and Perum Perhutani. The focus of the workshop will be on fund raising and efforts to broaden the financial support for model forests. The technical content of the workshop will be facilitated by resource persons from Venture for Fund Raising – an NGO based in the Philippines with extensive experience in analyzing funding needs and opportunities for non-profit organizations.

## RILSIM VERSION 2.0 AVAILABLE

In mid-2003, the first version of RILSIM (**R**educed-**I**mpact **L**ogging **S**IMulator), a software package for financial analysis of alternative logging systems, was released. Since then, more than 500 copies of the software have been distributed worldwide. In addition, more than 500 copies have also been downloaded.

As is the case with any new software, the users of RILSIM experienced several minor glitches or flaws. During a series of five promotion and training seminars, organized under the umbrella of the Asia-Pacific Forestry Commission (APFC) and held in Malaysia in late 2003, participants attending the events provided very constructive comments and suggestions on how to make RILSIM even more user-friendly than it already was. The RILSIM Steering Committee reviewed the more than 50 suggestions received in early 2004. Most were considered for the development of an updated version of the software.

Asking for an updated software package is a lot easier than actually doing the work. It took about six months to incorporate all the modifications. Finally, RILSIM version 2.0 has been released. If you would like to receive RILSIM 2.0 please contact:

*Gary Man*

*Asia and the Pacific Coordinator*

*1099 14th St NW, Suite 5500W*

*Washington, D.C. 20005*

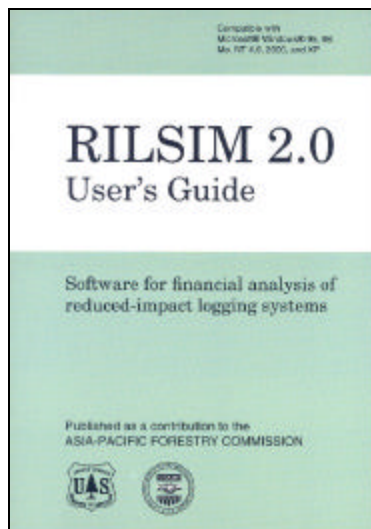
*Tel: 202-273-4740; Fax: 202-273-4750*

*E-mail: [gman@fs.fed.us](mailto:gman@fs.fed.us)*

If you prefer to download the program and the User's Guide, it is available on the following website:

<http://www.blueoxforestry.com/RILSIM/index.htm>

We hope that you find RILSIM 2.0 even more useful than the previous version and that it helps in identifying and calculating the financial costs and benefits incurred by switching from conventional to reduced impact logging.



## NEW RAP FORESTRY PUBLICATIONS

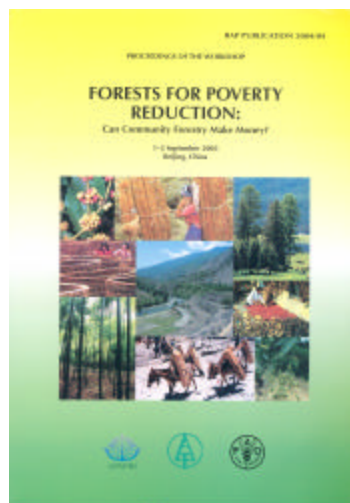
### PROCEEDINGS OF THE WORKSHOP “FORESTS FOR POVERTY REDUCTION: CAN COMMUNITY FORESTRY MAKE MONEY?”

RAP Publication 2004/04

More than 1.2 billion people in developing countries depend on farm trees to generate food and cash; another 350 million people live in or next to dense forests and rely on them for subsistence or income; and 60 million indigenous people live in and depend entirely for their survival on the tropical rain forests of South America, Asia and Africa. This clearly emphasizes how strongly human beings are dependent on trees and forests for survival.

Among the various forestry practices, community forestry provides the greatest source of support for rural people. The traditional view of community forestry is one of a subsistence role. But changes are needed on several fronts. New and innovative means have to be formulated so that community forestry can become a major source of income, particularly to marginalized communities. Sustainable forest management, marketing, processing and value addition to forest products are some areas for further exploration.

Community forestry can offer great opportunities. It can provide an ideal mechanism for the state to share resources with the poor, and at the same time conserve the environment and alleviate poverty. The state would not only transfer resources to the poor, but management responsibilities as well.



These are some of the issues that were discussed in Beijing, China, 1-3 September 2004, at the workshop “Forests for Poverty Reduction: Can Community Forestry Make Money?” These proceedings are a compilation of the experiences of many countries in the Asian region in implementing community forestry and should be a valuable source information for professionals and other interested parties.

*“The frog does not drink up the pond in which he lives.”*

*Native American proverb*



## **ASIA-PACIFIC FORESTRY CHIPS AND CLIPS**

### **VIETNAMESE NATIONAL PARK RECEIVES WORLD HERITAGE STATUS**

The Phong Nha and Ke Bang National park became the fifth national park in Viet Nam to receive World Heritage status. The park is located in the central Quang Binh province, 400 kilometers south of Ha Noi. The site is home to the oldest karst formations in Asia. It boasts a range of spectacular caves and has one of the world's longest underground rivers, which is 8 kilometers long. It is hoped that the World Heritage listing will boost tourism in the area.

– *Vietnamese English Newspaper* –

### **VILLAGERS SET TO USE SPACE DATA IN INDIA**

A pilot project to establish village information kiosks to disseminate data on natural resources, land cropping, water resources and land use is being established by the Indian Space Research Agency (ISRO). Villagers will be able to use the data to locate wells, for the reclamation of land and for general resource management activities. The project is set to commence in Karnataka.

– *Bhumika Kulkarni, Times News Network* –

### **TIMBER YIELD TOOLBOX**

The U.K. Department for International Development and the Oxford Forestry Institute (OFI) have developed an Excel-based tool for regulating forest timber yield in mixed tropical forest “using minimal data.” According to OFI, the tool, called Myrlyn (Methods of Yield Regulation with Limited Information), “will be particularly useful for obtaining a reasonable estimate of a sustainable yield when the only data available is a single inventory.” The software is available for free download at: [www.myrlyn.org](http://www.myrlyn.org) or contact: Ms. Nell Baker, OFI, Department of Plant Sciences, South Parks Road, Oxford OX1 3RB, U.K.; E-mail: [nell.baker@ntlworld.com](mailto:nell.baker@ntlworld.com).

– *ITTO Tropical Forest Update* –

### **WEST JAVA NEEDS 1.7 BILLION TREES FOR REFORESTATION**

According to the Sunda Environment Observation Board, an NGO based in West Java, an analysis of satellite photos indicates that the deforested area in West Java reached 600,000 hectares in 2002. This is approximately 75 percent of the total forest land. It was estimated that some 1.7 billion trees would be needed to restore the forest area in the province.

– *The Jakarta Post* –

### **FIVE NATIONS CREATE FOREST TRUST FUND**

Five countries, including Viet Nam, have set up a fund to help improve management and allocation of official development assistance and execute forestry projects in Viet Nam.

The Netherlands, Finland, Switzerland, Sweden and Viet Nam signed a memorandum of understanding for the Trust Fund for Forest; while the five nations have already pledged contributions to the fund, more partners and donors are expected to join in the future.

The fund will be strictly supervised by international partners and donors and is considered an important step in protecting forests and implementing the 5 million hectare reforestation project. It will assist in implementing the country's forestry policies.

– *Viet Nam News, June 28, 2004* –

### **FOREST ISSUES FEATURE IN AUSTRALIAN ELECTION**

Debate over how to best manage forests in the Australian state of Tasmania featured prominently in the recent Australian election. Prime Minister John Howard, whose conservative coalition won the election, vowed to preserve an additional 170,000 hectares of old-growth forest from logging, but promised that no timber industry jobs would be lost under

the proposal. Mr. Howard's rival, Mark Latham, had called for more sweeping proposals to put ancient forests of Tasmania off limits to logging.

– *BBC News* –

### **AUGUST FOREST FIRES SWEEP ASIA**

Major forest fires swept many areas of Asia in the month of August. More than 750 fires burned over 31,000 hectares in the Russian Far East. Fires also burned large areas in Kalimantan and Riau, in Indonesia, causing haze problems locally and in neighboring Malaysia and Singapore.

– *Itar-Tass and The Jakarta Post* –

### **TIGHTER CONTROLS ON TRADE OF RAMIN AND AGARWOOD APPROVED BY CITES**

At the recent Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), convened in Bangkok in October 2004,

decisions were approved to list ramin (*Gonystylus* spp.) and agarwood (produced primarily by species of *Aquilaria* and *Gyrinops*) on CITES Appendix II. Such listing indicates a species is at risk from uncontrolled international trade. Under the Appendix II listing, import and export is controlled through a permit system intended to verify that shipments come from harvests that do not endanger the species.

– *Bangkok Post and TRAFFIC press release* –

### **CHINA'S FURNITURE EXPORTS CONTINUE TO GROW**

Despite facing new anti-dumping penalties on exports to the United States, Chinese furniture production and exports continue to expand rapidly. According to China Customs, furniture exports in the first half of 2004 topped US\$4.93 billion, an increase of 42 percent over the same period in 2003.

– *ITTO Tropical Timber Market Report* –

## **FRA 2005 REVIEW AND TRAINING WORKSHOP**

The Regional Review and Training Workshop of Asia-Pacific Countries for Forest Resource Assessment 2005 will be held in Bangkok, Thailand, 23-26 November 2004, at the FAO Regional Office for Asia and the Pacific.

Thirty countries are expected to participate in this meeting: Afghanistan, Australia, Bangladesh, Bhutan, Brunei, Cambodia, China, DPR Korea, Fiji, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Solomon Islands,

Singapore, Sri Lanka, Thailand, Timor-Leste, Vanuatu, Viet Nam and U.S.A.

The objectives of the meeting are as follows:

- to technically review the draft "FRA 2005 Country Reports" of each of the participating countries;
- to identify major constraints, if any, and suggest ways to address these;
- to assist and technically guide countries with major reporting problems; and
- to develop national work plans for final submission of country reports to FRA 2005.

## FAO ASIA-PACIFIC FORESTRY CALENDAR

18-19 October 2004. **World Food Day Celebration and Meeting of the Regional Alliance Against Hunger.** Bangkok, Thailand. Contact: P. Mudbhary, Policy Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4236; Fax: (662) 697-4445; E-mail: [Purushottam.Mudbhary@fao.org](mailto:Purushottam.Mudbhary@fao.org)

19-21 October 2004. **Development of an Asia-Pacific Strategy for Eucalyptus Rust.** Bangkok, Thailand. 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](mailto:Patrick.Durst@fao.org)

23-26 November 2004. Bangkok, Thailand. **Regional Review and Training Workshop of Asia-Pacific Countries for Forest Resource Assessment 2005.** Contact: M. Kashio, Regional Forestry Resource Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4141; Fax: (662) 697-4445; E-mail: [Masakazu.Kashio@fao.org](mailto:Masakazu.Kashio@fao.org)

25-28 November 2004. Bishkek, Kyrgyzstan. **First Central Asia Forestry Congress.** Contact: Tyratbek Musuraliev, Chairman, State Forest Service of the Kyrgyz Republic; Tel. +99631261-00-16; Fax: +99631261-13-96; E-mail: [forest@bishkek.gov.kg](mailto:forest@bishkek.gov.kg)

29 November – 2 December 2004. Santiago, Chile. **Twenty-second Session of the International Poplar Commission.** Contact: J.B. Carle, Secretary IPC, FORM, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; E-mail: [Jim.Carle@fao.org](mailto:Jim.Carle@fao.org)

6-10 December 2004. **Regional Model Forest Network Workshop on Financial Sustainability.** Supported by IMFNS, FAO, IDRC, the Indonesian Ministry of Forestry and Perum Perhutani. 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](mailto:Patrick.Durst@fao.org)

8-10 December 2004. **Asia Forest Partnership meeting.** Tokyo, Japan. 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](mailto:Patrick.Durst@fao.org)

11 December 2004. **International Mountain Day Celebration.** For further information, please visit: [www.mountainpartnership.org/imd/imd.html](http://www.mountainpartnership.org/imd/imd.html)

14-18 March 2005. Rome, Italy. **17<sup>th</sup> Session of the Committee on Forestry.** Contact: Doug Kneeland, Programme Coordinator, Programme Coordination Unit, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; E-mail: [Douglas.Kneeland@fao.org](mailto:Douglas.Kneeland@fao.org)

26-28 July 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](mailto:Patrick.Durst@fao.org)

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- Ministry of Environment and Forests. 1991. **Towards Sustainable Development: National Conservation Strategy of Bangladesh (First Draft)**. Government of the People's Republic of Bangladesh/IUCN. pp.267.
- Ministry of Environment and Forests. 1993. **Forestry Master Plan: Volume 1**. Government of the People's Republic of Bangladesh. pp.254.
- Ministry of Environment and Forests. 1995. **National Environmental Management Plan (NEMAP) Vol.1a**. Summary MOEF, Government of the People's Republic of Bangladesh. pp.51.
- Rahman, S.M., Mowla, S.M.G. and R.M. Choudhury. 2000. **Forest Department in Forest Development and Conservation**. Fact Sheet, Forest Department, Ministry of Environment and Forest, Bangladesh.
- Rosario, E.A. 1997a. **A conservation management plan manual for protected areas in Bangladesh**. Government of Bangladesh/World Bank Forest Resources Management Project Technical Assistance Component, Forest Department, Dhaka, Bangladesh. pp.102.
- Rosario, E.A. 1997b. **The conservation management plan for the protected areas other than those in the Sundarbans Reserve Forests in Bangladesh (Final Report)**. Forest Resources Management Project, Technical Assistance Component, Government of Bangladesh/World Bank. pp.342.
- Rosario, E.A. 1997c. **The conservation management plan of the wildlife sanctuaries in the Sundarbans forests (Final Report)**. Government of Bangladesh/World Bank Forestry Resources Management Project, Technical Assistance component. Forest Department, Dhaka, Bangladesh. pp.187.

*Authors' addresses: Md. Qumruzzaman Chowdhury, Department of Forestry, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh, Email: [gumrul-for@sust.edu](mailto:gumrul-for@sust.edu); Md. Masuduzzaman Afrad, Bangladesh Forest Department, Bhan Bhaban, Dhaka-1212, Bangladesh; A.Z.M. Manzoor Rashid, Department of Forestry, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh.*

## HERPETOFAUNA OF RATANMAHAL WILDLIFE SANCTUARY, GUJARAT, INDIA

*by Raju Vyas*

### **Introduction**

There are a few protected areas (PAs) in Gujarat State that have not been explored by herpetologists. Therefore, preliminary data of herpetofauna in such PAs are not available for areas such as Jassor, Balaram-Ambaji, Pania and Ratanmahal Wildlife Sanctuary.

Not much data is available about the various species of amphibians and reptiles of Ratanmahal Wildlife Sanctuary (RWS). There are a few scattered notes on the records of

*Kaloula pulchra* (Vyas and Patel, 1994), *Psammophilus blanfordanus* (Vyas, 2000) and *Ophisops beddomei* (Vyas, 2003). Thus, a more detailed study was needed in RWS to investigate and prepare an inventory of the herpetofauna.

### **Study area**

Ratanmahal Wildlife Sanctuary is a unique forest area encompassing 55.65 km<sup>2</sup> in Dahod District, Gujarat State, lying between 74°00'-74°12' E latitude and 22°30'-22°40' N

longitude. Most of the sanctuary is in the western part of Vindhya and is known as the Malwa Hills. Previously it was a shikar reserve (game sanctuary) of the ex-princely state of Devgadhi Baria, and since 1982 it has been one of the most important protected areas in Gujarat. The sanctuary is known to be a prime habitat for the Indian sloth bear, with altitudes ranging from 203-670 m above sea level.

The climate is subtropical arid, which turns humid during the monsoon season. The average annual rainfall is 980 mm, with most of the rainfall occurring from July to September, with occasional rains in the winter. The weather gradually becomes very dry and cold from November to February, followed by a long, hot summer, with the highest temperatures in May and June. The mean annual temperature in the sanctuary is 25.5° C, with a maximum of 44° C and minimum of 6.1° C.

According to Champion and Seth (1968), the entire forest area is a tropical dry deciduous type, that can be further classified into four sub-types, i.e. 5A/C 1b dry teak forest; 5A/C 2 southern dry mixed deciduous forest; 5/E 9 dry bamboo brakes; and 3B/C 2 southern moist mixed deciduous forest.

A total of 543 species of plants were recorded, out of which 119 species of trees, 40 species of shrubs, 283 species of herbs, 48 species of grasses, 87 species of climbers and 11 species of orchids have been recorded (Singh *et al.*, 2002).

### Methodology

The inventory was carried out during the period October 1999 to February 2001, and a total of 50 days (8 hrs/day) were spent for the field work. Further detailed studies will be carried out with the help of secondary data gathered from a previous survey of the relevant literature. In addition, information will be gathered through interviews with the local people in the surrounding villages and with forest personnel.

The entire sanctuary area was divided into eleven zones. Each zone was randomly explored on the basis of habitat structure, possibility and availability of the species. All of the important major and minor perennial water bodies were extensively explored for aquatic species. All collected specimens were examined carefully and identified by using the diagnostic keys given by Smith (1935, 1943) and Daniel (1997). The nomenclature adopted here is that of Das (1994) and Dutta (1997) for reptiles and amphibians respectively.

## Results

### *Amphibians*

A few common species of frogs and toads were encountered in RWS. These were found in water bodies, wells, streams and agricultural fields. Ten species of amphibians belonging to 4 families, all of them Anurans, were found in RWS. Out of these, two species belonging to Bufonidae and Microhylidae, one species of Rhacophoridae and five species from the Ranidae family have been recorded from the sanctuary. The frogs and toads are most common and abundant, except for the Indian painted frog (*Kaloula pulchra*) and the Indian tree frog (*Polypedates maculatus*), which are rare in the forest.

### *Reptiles*

During the present study, 25 species of reptiles belonging to eleven families were recorded in the sanctuary, including 11 species of lizard and 13 species of snakes. Efforts were made to evaluate the status and distribution of the different reptilian species in various habitat types, but this was only possible with lizards. Due to the short period of study, it was not possible to ascertain the status of snakes. The relative abundance of each species was assessed, and the status (common or rare) was determined on the basis of occurrence, sightings and the preferred habitat of each species in the sanctuary. Two species – Fan-throated lizard (*Sitana ponticerianus*) and Bronze-back skink (*Mabuia macularia*) are found in abundance in the sanctuary and the remaining species are common, except for *Ophisops beddomei* and *Chamaeleon*

*zeylanicus*, which are less common, and *Lygosoma* was rarely spotted in the area during the study period.

### Acknowledgments

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### References

Champion, H.G. and S.K. Seth. 1968. A revised survey of the forest types of India. Govt. of India, Delhi-6. 404 pp.  
 Daniels, R.J. 1977. A field guide to the frogs and toads of the Western Ghats, India. Part I, II and III. *Cobra* (27 to 29):1-25, 1-24, 1-13.  
 Das, I. 1994. The reptiles of South Asia: Checklist and distribution summary. *Hamadryad* 19:15-40.  
 Datta, S.K. 1997. Amphibians of India and Sri Lanka (Checklist and bibliography). Odyssey Publication House, Bhubaneswar, Orissa, India. 342 pp.

Singh, H.S., Patel, B.H., Tribedi, P., Raval, B.R., Pawar, J.S., Vyas, R. and B.H. Patel. 2002. Biodiversity study in Ratanmahal Wildlife Sanctuary (A comprehensive ecological and socio-economic study). Gujarat Ecological Education & Research Foundation, Gandhinagar. 228 pp.  
 Smith, M.A. 1935. Fauna of British India, Reptiles & Amphibians Vol.II. Taylor and Francis, London. 185 pp.  
 Smith, M.A. 1943. Fauna of British India, Reptiles & Amphibians Vol.III. Taylor and Francis, London. 583 pp.  
 Vyas, R. 2000. First record *Pasammophilus blandfordanus* (Stoliczka, 1871) (Family:Agamidae) from Gujarat State. *J. Bombay Nat. Hist. Soc.* 97(3):432-434.  
 Vyas, R. 2003. First record of *Bedom's lacerta* from Ratanmahajal Wildlife Sanctuary, Gujarat. *Hamadryad* 27(2):55.  
 Vyas, R. and B.H. Patel. 1994. Second record of the frog *Kaloula pulchra* Gray from Gujarat State. *Cobra* (18):12-13.

Author's address: c/o Sayaji Baug Zoo, Vadodara, Gujarat, India.

**Table 1: List of amphibians recorded from Ratanmahal Wildlife Sanctuary, Gujarat**

Sr. No.	Family/Common Name (Scientific Name)
	<b>Bufonidae</b>
1	Common Asian toad ( <i>Bufo melanostictus</i> )
2	Marbled Toad ( <i>Bufo stomaticus</i> )
	<b>Microhylidae</b>
3	Ornate narrow-mouthed frog ( <i>Microhyla ornata</i> )
4	Indian painted frog ( <i>Kaloula pulchra</i> )
	<b>Ranidae</b>
5	Indian skipping frog ( <i>Euphlyctis cynophlyctis</i> )
6	Indian green frog ( <i>Euphlyctis hexadactylus</i> )
7	Indian bull frog ( <i>Hoplobatrachus tigerinus</i> )
8	Cricketer frog ( <i>Limnonectes limnocharis</i> )
9	Short-headed burrowing frog ( <i>Sphaerotheca breviceps</i> )
	<b>Rhacophoridae</b>
10	Indian tree frog ( <i>Polypedates maculates</i> )

**Table 2: Reptilian species recorded from Ratanmahal Wildlife Sanctuary, Gujarat**

Sr. No.	Order	Common Name	Family/Species
	Testudines		<b>Testudinidae</b>
1		Common flap shell turtle	<i>Lisseyms punctata</i>
	Lecertilia		<b>Gekkonidae</b>
2		Brook's gecko	<i>Hemidactylus brookii</i>
3		Yellow-green house gecko	<i>Hemidactylus flaviviridis</i>
4		Bark gecko	<i>Hemidactylus leschenaultia</i>
			<b>Agamidae</b>
5		Garden lizard	<i>Calotes versicolor</i>
6		Blanford's rock agama	<i>Psammophilus blanfordanus</i>
7		Fan-throated lizard	<i>Sitana ponticeriana</i>
			<b>Scincidae</b>
8		Supple skink	<i>Lygosoma punctatus</i>
9		Common keeled grass skink	<i>Mabuya carinata</i>
10		Bronze back skink	<i>Mabuya macularia</i>
			<b>Lacertidae</b>
11		Bedome's lacerta	<i>Ophisops beddomei</i>
			<b>Chameleonidae</b>
12		Indian chameleon	<i>Chamaeleon zeylanicus</i>
	Serpentes		<b>Typhlopidae</b>
13		Brahminy worm snake	<i>Ramphotyphlops braminus</i>
			<b>Boidae</b>
14		Red sand boa	<i>Eryx johnii</i>
15		Indian rock python	<i>Python molurus</i>
			<b>Colubridae</b>
16		Rat snake	<i>Ptyas mucosus</i>
17		Common bronzeback tree snake	<i>Dendrelaphis tristis</i>
18		Indian green keelback	<i>Macropisthodon plumbicolour</i>
19		Streaked kukri snake	<i>Oligodon taeniolatus</i>
20		Checkered keelback water snake	<i>Xenochrophis piscator</i>
			<b>Elapidae</b>
21		Spectacled cobra	<i>Naja naja</i>
			<b>Viperidae</b>
22		Russell's viper	<i>Doboia russellii</i>
23		Bambo o pit viper	<i>Trimeresurus gramineus</i>
24		Indian saw-scaled viper	<i>Echis carinatus</i>

**Table 3: Habitat-wise distribution and status of lizards in Ratanmahal Wildlife Sanctuary, Gujarat**

Sr.	Species	Plain/Plateau	Agriculture	Riverine	Forest	Associated with humans	Status*
1	<i>Hemidactylus brookii</i>	Y	-	Y	Y	Y	Co
2	<i>Hemidactylus flaviviridis</i>	-	-	Y	-	Y	Co

3	<i>Hemidactylus leschenaultia</i>	Y	-	Y	Y	-	Co
4	<i>Calotes versicolor</i>	Y	Y	Y	Y	Y	Co
5	<i>Psammophilus blanfordanus</i>	-	-	Y	Y	-	Co
6	<i>Sitana ponticeriana</i>	Y	Y	Y	Y	Y	Ab
7	<i>Lygosoma punctatus</i>	Y	-	Y	-	-	Re
8	<i>Mabuya carinata</i>	-	Y	Y	Y	Y	Co
9	<i>Mabuya macularia</i>	-	Y	Y	Y	Y	Ab
10	<i>Ophisops beddomei</i>	Y	-	Y	Y	-	LCo
11	<i>Chamaeleon zeylanicus</i>	Y	-	Y	Y	-	LCo

Y=Present; Co=Common; Ab=Abundant; LCo=Less Common.

(\*Relative abundance: rare 1-5; Less Common 6-25; Common 26-75; Abundant over 75)





# IMPACT OF PHUMDI PROLIFERATION ON THE RESIDENT BIRDS OF LOKTAK LAKE, MANIPUR (INDIA)

By K. Jugeshor Singh and Pebam Rocky

## Introduction

Loktak Lake is a Ramsar<sup>1</sup> site in Manipur State and is the largest natural freshwater lake in the northeastern region of India. The lake is oval in shape with a length and width of 26 km and 13 km respectively, covering an area of about 289 km<sup>2</sup> at an altitude of 768 m above sea level. The depth of the lake varies from 0.5 to 4.58 m, with an average depth recorded at 2.7 m.

The characteristic feature of this lake is the presence of floating islands covered with vegetation, locally known as *phumdi*. These floating islands that occur in all sizes and thicknesses are heterogeneous masses of soil, vegetation and organic matter in various stages of decomposition. They float on the lake with about one-fifth of their thickness above water and the rest below the surface. Though a eutropic lake, Loktak maintained a somewhat healthy ecosystem before the commissioning of the controversial Loktak Electric Project in 1983. This internationally important and biologically rich lake is a unique wintering ground for various migratory waterfowl and the permanent home to many resident waterbirds.

## Resident waterbirds of Loktak Lake

Loktak is home to about 116 species of birds, of which about 21 are migratory waterfowls, mostly coming from different parts of the northern hemisphere beyond the Himalayas (Anon., 1999). Some of the important resident waterbirds of Loktak and its surrounding wetlands are given in Table 1.

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<sup>1</sup>Ramsar - The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

## Phumdi proliferation versus birds

The damming of Loktak at Ithai (Ithai barrage) across the Manipur River for storage of water to generate electricity has completely altered the natural process of draining, as well as the ecosystem of the lake. The inflow of sediments, along with a good amount of nutrients from the various streams (33 feeder streams) led to rapid growth and expansion of the phumdis in the lake. Phumdis of various sizes and thickness occupy about one-third of the lake area (Anon., 1999). As seen from the remote sensing imageries, the number of athaphums (a type of fishing) has increased tremendously from 217 in 1990 to 3,019 in 1999 (Anon., 2002).

The hydrological and ecological changes have upset the once delicately balanced wetland ecosystem, which is rapidly eroding the rich biodiversity of the lake. In addition to the other problems, the unprecedented massive proliferation of phumdis in the lake since the damming has created many threats to the resident waterbirds of Loktak. Some of the important problems encountered by these birds are given below.

### Loss of open water spaces

Aquatic plants such as water chestnut, giant water lily and lotus are inseparably associated with some resident birds of the lake, like the pheasant-tailed jacana, bronze-winged jacana, etc., as they form part of the birds' habitat. But today, these plants are considerably decreased in their population sizes compared to in the past due to factors like a higher water level and the presence of phumdis at places throughout the year. Habitat destruction is the most serious challenge to the existence of wildlife.

### Loss of food

Fishes, aquatic insects, certain aquatic plants and crustaceans, particularly snails, form the

main food of the waterbirds. However, due to the shortage of open water space and probably poor water quality resulting from the massive proliferation of phumdis, the population sizes of these animals and plants have sharply decreased in recent years. This is a challenge to the birds that consume these organisms.

#### Loss of breeding ground

Resident waterbirds like the pheasant-tailed jacana, bronze-winged jacana and the little grebe lay eggs directly on the floating aquatic vegetation. Therefore, the loss of aquatic plants is a serious threat to the existence of these near extinct birds of the lake. Birds such as the spotbill duck, cotton teal, pheasant-tailed jacana and bronze-winged jacana have never reached triple figures in their populations (Waterfowl counts of Loktak Lake, 2000-2001).

#### Anthropogenic activities

As the huge lake is being occupied by phumdis in all the strategic areas, human activities like fishing, fodder and vegetable collection, etc. are now shifting from the lake to the surrounding wetlands where the waterbirds are sheltering. This poses a serious threat to these birds, particularly during the breeding season.

#### **Recommendations/suggestions**

1. The natural process of draining the sediment and phumdis along the Manipur

River through Khordak cut and other channels should be restored.

2. An awareness campaign amongst local fishermen, particularly those engaged in phumdi fishing, should be organized to educate them to reduce the number of athaphum and its impact on the lake.
3. An awareness campaign amongst the local people, particularly the NGOs, should be organized to educate them about the importance of conservation of birds and their habitat to strengthen the biological diversity of the lake.
4. A bird sanctuary should be created at a suitable place on the lake.
5. A status survey of the resident waterbirds of Loktak and its surrounding wetlands should be conducted.
6. A closed season should be declared in the breeding ground areas. In addition, an awareness campaign should be organized to educate the local people to stop the killing of birds, collection of eggs, and any disturbances during the breeding season.

#### **References**

- Anonymous. 1999. **Loktak. Vol.1.** Newsletter, LDA, Imphal and WISA-New Delhi, p.8.  
 Anonymous. 2002. **Loktak. Vol.II.** Newsletter, LDA, Imphal and WISA-New Delhi, p.16.

*Senior author's address: c/o Department of Zoology, Kumbi College, Moirang – 795 133, Manipur, India.*

**Table 1: List of resident waterbirds of Loktak Lake**

<b>English Name</b>	<b>Local Name</b>	<b>Scientific Name</b>
Little grebe	Uthih	<i>Tachybaptus ruficollis</i>
Night heron	Chongkhu	<i>Nycticorax nycticorax</i>
Cattle egret	Sandung-il	<i>Babulcus ibis</i>
Purple heron	Ushai saingang	<i>Ardea purpurea</i>
Pond heron	Lamprai	<i>Ardeola grayii</i>
Bitterns	Hongai	<i>Ixobrychus</i> sp.
Lesser whistling teal	Tingee	<i>Dendrocygna javanica</i>
Spotbill duck	Nganu pirel	<i>Anas poecilorhyncha</i>
Cotton teal	Pedagot	<i>Nettapus coromandelianus</i>
Watercock	Uthum	<i>Gallicrex cinerea</i>
Purple moorhen	Umu	<i>Porphyrio porphyrio</i>
Bronze-winged jacana	Thamnachenbi	<i>Metopidius indicus</i>
Pheasant-tailed jacana	Yen pourabi	<i>Hydrophasianus chirugus</i>
Moorhen	Uren	<i>Gallinula chloropus</i>

# MORPHOLOGICAL AND HABITAT CHARACTERISTICS OF LONG-BEAKED ECHIDNA (*Zaglossus bruijnii*) IN ARFAK NATURAL RESERVE, MANOKWARI REGENCY, WEST PAPUA (INDONESIA)

by Fatem Sepus M.

## Introduction

Indonesia's province of Papua (formerly Irian Jaya), spreads over 416,000 km<sup>2</sup> and lies in the western half of New Guinea. It is home to about 20,000 species of plants, 164 species of mammals, 650 species of birds, 250 species of freshwater fish and 1,200 sea fish, 150,000 species of insects and 139 species of reptiles and amphibians (Conservation International, 1997).

Arfak mountain, located in the eastern Bird Head of New Guinea, is a natural reserve with an area of approximately 68,000 ha. The elevation can rise up to 2,940 m above sea level. The reserve has a rich endemic flora and fauna and the area is well known for its complex variety of animal holotype species.

The reserve contains three types of tropical rainforest: 1) lowland tropical; 2) foot of mountain; and 3) low mountain. These forests support a variety of plants and endemic animals. Pectocz (1994) and Flannery (1995) both reported that one of the endemic fauna species of Papua is the long-beaked echidna (*Zaglossus bruijnii*). This mammal lives in the highland area and is a source of protein and other benefits to the people of Papua. However, human activities such as hunting and the opening of the area for plantations, settlements and roads, are threatening the animal's existence. Therefore, action is needed to preserve the species from extinction. This would include *ex-situ* and *in-situ* conservation as follow-up activities after studying the animal's morphology and habitat.

The aim of the present study was to study the morphological aspects and habitat of *Zaglossus bruijnii* in the Arfak Mountain Natural Reserve. The objectives were as follows:

1. To contribute knowledge about the potential of the biological diversity of wild animals in Papua.
2. To contribute to the data base of animal diversity in order to support the efforts to domesticate wild animals and improve their productivity.
3. To inform the management of the reserve about the benefits of local natural resources, in particular the wild animals.

## Materials and methods

The study was carried out from 4 August to 20 October 2002, in the village of Mokwam in the Arfak Mountain Natural Reserve in Manokwari regency, West Papua. The method used was the descriptive method with observation technique and semi-structured interviews.

Two variables were used in the study – the primary variable, which comprised the morphological aspect and the animal's habitat, and secondary variables such as topography, ethno-zoology, and the traditional conservation system. The morphological data collected included the length and type of snout, body length, size of chest, weight, length of leg claws, and the length and diameter of thighs. Habitat data was collected regarding the animals' nests, including temperature and position. Other data collected included ethno-zoology and traditional conservation concepts.

### Morphological characteristics of *Zaglossus bruijnii*

The local people of the Arfak Mountains have much knowledge about their environment because their lives depend on it. This includes the biological natural resources in the surrounding areas. *Zaglossus bruijnii* is known as *micun* in the Hatam language spoken by the Arfak people in the Arfak Mountains.

The study found that there is one species of *Zaglossus bruijnii* living in the Arfak Mountains Natural Reserve with the common characteristics of having a long snout and three claws.

The following table shows the measurements of three different *Zaglossus bruijnii* found in the reserve.

Sample	Length of snout (mm)	Width & length of eyelid (mm)	Length of head (mm)	Length of body (mm)	Diameter of chest (mm)	Weight (g)	Length of claw (mm)	Length of thigh (mm)	Diameter of thigh (mm)
<b>Female</b>									
1	103	4/2	194	663	650	10,070	59	123	263
2	104	4/3	194	663	651	10,080	61	125	264
Median	103.5	4/2.5	194	663	650.5	10,075	60	124	263.5
<b>Male</b>	101	3/2	190	660	647	10,068	56	120	260

Based on the data above, the females are bigger than the males. The females had an average body length of 663 mm and average weight of 10,075 g, while the male was 660 mm in length and weighed 10.068 g. The difference in size also applied to the other measurements taken. Berwulo (1994) supported the female-male differences.

### Habitat of *Zaglossus bruijnii*

The habitat of *Zaglossus bruijnii* in the Arfak Mountains Natural Reserve lies at an altitude of 1,380 m about sea level. Several nests were examined during the study. The lowest nest temperature was 17°-20° and the humidity was 77-81%. It was observed that *Zaglossus bruijnii* does not have permanent nests like some other animals. They nest on the nests made by other animals (Mackinnon, 1986). When foraging for food, he areas they look for are the ultisol type, yellowy soil, red soil and dusty-clay soil. Such conditions support the metabolic process and provide organisms such as *Helodrilus* as food for *Zaglossus bruijnii*, which the animal digs out of the soil with its long claws. The animals usually forage in the early morning hours (04.00-05.30)

and in the evening (19.00-20.00). This is influenced by the activity of their main prey organisms.

Vegetation also plays a significant role in the existence of *Zaglossus bruijnii* as the vegetation provides shelter, playground, nests and other ecological functions. The type and distribution of the vegetation also influences the distribution of the animals. *Zaglossus bruijnii* depends on the diversity of various levels of vegetation.

### Traditional conservation practices

The Hatam tribe, a sub-family of Arfak, has a system of traditional conservation practices toward their environment that is called "Igyser hanjop," which means "the preserved area." To demarcate the preserved area, they use a wooden cross sign tied with rattan, facing downward, and on the edge of the cross they tie a piece of charcoal. Regarding the prohibition to exploit the forest, they use kinds of seeds as markers and rattan is tied around *Pandanus* sp.

The meat of *Zaglossus bruijnii* is eaten by the local people and the claws and hair are used for magical purposes. The claws are also used as a sign to indicate a prohibition on trees or other plants. Another traditional conservation practice of the area is that people who do not belong to the local clans/families are not permitted to hunt in the area. There are sanctions given to those who break the traditional law. The concepts of Igyaser hanjop are divided into three areas:

- 1) Bahamty, or the primary forest that lies high up from the resident area. In this area is prohibited to build houses or villages, or to plant gardens.
- 2) Nimahanty is the second area. It is part of the forest with high humidity where moss is found on the trees. It is prohibited to open gardens in this area because the temperature is too cold.
- 3) Susti is the third area, which is the secondary forest in which people can establish gardens or use for other purposes.

### Conclusion

More research is needed about the biology, ecology and other aspects of *Zaglossus bruijnii* in order to complete the information about this species.



### References

- Anonymous. 1993. **Arfak Mountain Nature Reserve Analysis**. SSBKSA (The Institute of Natural Resources Conservation) and WWF Indonesia Program.
- Berwulo, 1994. **Basic Conservation Management Area**. The Institute of Natural Resources Conservation. I. West Papua.
- Conservation International Indonesia. 1997. **The Irian Jaya Biodiversity Conservation Priority-Setting Workshop**. Conservation International, Washington, D.C.
- Mackinnon, J. 1986. **Indonesia Nature of Native Flora-Fauna**. Indonesia Green Foundation and PT. Gramedia Jakarta.
- Flannery, 1995. **Mammals of New Guinea**. Australian Museum. Revised and Updated Edition.
- Petocz, R.G. 1994. **Mammals of Irian Jaya**. Grafitipres Jakarta.

*Author's address: Forest Faculty, Papua State University, Jl. Gunung Salju Amban Manokwari, Papua, Indonesia; E-mail: [sepus\\_fatem@yahoo.com](mailto:sepus_fatem@yahoo.com)*



# MAN-ANIMAL CONFLICTS IN AND AROUND PROTECTED AREAS – A CASE STUDY ON GIR NATIONAL PARK/WILDLIFE SANCTUARY, JUNAGADH, GUJARAT, INDIA

*by Satya Priya Sinha, Bharat J. Pathak and P.P. Rawal*

In the last five decades, the exponential increase in the human and livestock population, and the resultant imbalance in the land:people ratio, besides changes in land use patterns, have placed a tremendous pressure on natural resources like the forests and the wildlife. In order to meet the increased demands of the human population, vast areas of forests, marginal lands, pastures and wastelands have been brought under cultivation, with the result that even the protected areas have become fragmented and disturbed by human activities, cattle grazing and exploitation of natural resources on a large. The process of encroachment on forestland is still continuing (The State of Forest Report, 1993). The situation in rural areas is very much characterized by irrational and unsustainable land use patterns. Added to these are industrialization and other developmental activities such as irrigation and hydro-electricity projects, mining and other developmental activities, which have had a drastic impact on protected areas.

Such human-related disturbances in wilderness areas have, over a period of time, ecologically dislocated some of the wildlife species. While a few of these are able in due course to successfully adapt to man-altered habitats, others stray out of protected areas and cause damage to human life (at times fatally) and property. At the same time, man also enters the wilderness areas for his own needs, and thus a different dimension of the conflict begins. The interface of wildlife habitats and a human-use dominated landscape has become grounds for a wide range of man-wildlife conflicts. Improvements in agricultural technology and integrated rural community development programs in such areas seek to

contain the conflict, but they provide only a short-term solution.

Cultivation of sugarcane and mango plantations has increased the area of man-made forests around the Gir Protected Area. This has allowed large felids and other wild animals to stray out of the protected area and find shelter here, leading to increased interaction with humans and cases of conflict.

Straying has been defined as “to wander away from home or from the right way and lost from home”. In other words, the lions and leopards here are not “lost from home,” but are searching for a “lost home” that once existed outside the Gir Protected Area.

Straying is fairly common in all the protected areas in India, e.g. the sugarcane tigers of Dudhwa; the tea garden leopards in North Bengal and Assam; elephants in Uttaranchal, Bihar, Orissa and North Bengal; rhino in North Bengal and Assam; and the generally widespread problem of nilgai and wild boar around protected areas.

The single most common factor contributing to the straying by wild animals is shrinkage and fragmentation of the habitat and increasing biotic pressure on these miniscule areas. The specific factors operating around Gir PA are:

1. radical demographic changes in terms of the human and livestock population and their needs;
2. fertile black cotton soils give good crops, which attract herbivores and, in turn, carnivores;
3. changing cropping patterns, land use practices such as opting for mango plantations, and the land:human ratio; and

4. effective management also leads to alterations in the habitat, making it denser, and thereby unsuitable, for large predators because it inhibits their hunting style and forces them to stray.

Gir PA and its surrounding areas receive little rainfall. During the summers and monsoon season, cattle migrate from neighboring areas in search of fodder and water, enter Gir PA, and thereby put enormous pressure on the resources. Moreover, this allows large felids easy predation on unattended livestock. At the same time, cultivated land also provides regular water and ideal cover for the wild animals as well.

To get an overall scenario, about 100 villages around Gir PA were visited to derive first-hand information on the above from the locals, village heads and farmers.

### **Findings and conclusions**

#### *Economic status*

Loss of cattle to wild carnivores and crop damage by wild herbivores can be a very serious blow to the livelihood of a villager already under pressure by the forest laws. Cumulatively, these processes have worked to marginalize the poor peasants and tribals, the social groups most heavily dependent on forest resources for their subsistence and survival.

However, unlike the rest of the country, especially the central Indian and the Himalayan regions, the people living in and around Gir seem to be quite well off. The status of the Maldharis living inside the Gir Protected Area can be assessed by their livestock strength. They keep up to 80 and even more livestock per family; and it is reported that they also act as caretakers for cattle from outside the protected area, especially during the monsoons. The Maldharis sell milk (which is collected by the middlemen from the nearest road head) and clarified butter (ghee – mainly in remote areas like Lilapani, Jamwali, etc.) for their subsistence. The market price of milk is Rs9-12 per liter, and that of ghee is Rs100-130 per kg. Considering that they may also have a

good percentage of unproductive cattle, still, the virtually freely available fodder from the forest, at least during the daytime, is a great advantage.

The farmers are totally dependent on agriculture, although there is no precise idea of the upper limits of the landholdings. The black cotton soil in the region is very fertile and the farmers grow a variety of crops such as groundnut, jowar, and bajra (in monsoon), wheat (in winter), and sugarcane and cotton (throughout the year). Export quality mangos (mainly the kesar variety) are also grown extensively in composite plantations within the agricultural lands. The interests of rich farmers have fueled an indiscriminate expansion in water extraction devices and planting of water-intensive crops. In the last 25 years, there has been a nearly sixty-fold increase in the number of electrical pump sets and tube wells in rural Gujarat. The ready availability of water has helped the farmers become richer and the daily wages of laborers have also increased. However, as a consequence, the water table in many parts of Gujarat has fallen alarmingly by several meters or more (Bhatia, 1992), and water availability within the forest areas has also lessened. One of the consequences of this has been that wild herbivores have started coming out of the forests more and entering the peripheral agricultural fields in search of water and fodder, leading to their causing damage to crops and serious conflicts with the farmers.

#### *Fuelwood and resource use*

Since ancient times, fuelwood has remained foremost among the needs of the people residing in and around the forests. Gir is no exception, and the fuelwood demand and dependency on the forest by the ness dwellers is absolute. About 361 Maldhari families live within the Gir Protected Area, consuming 15-20 kg of fuelwood per family per day. Teak and Acacia are used most, mainly through the collection of dry fallen branches, but lopping is also carried out. As a result, the forests around the Maldhari ness in Gir have conspicuously thinned down. In the settlements and the surrounding revenue villages, the demand for fuelwood is no less.

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The fuelwood demands of the villages within a 5 km radius of the protected area are also met from these forests, while in other areas outside, the fuel demand is to some extent met by kerosene and gobar gas plants. Occasionally, dry cactus (*Euphorbia nerifolia*) used for fencing agricultural lands, and dry branches of cotton and mango are also used for fuel. The demand for fuelwood from forests is less in the villages where cotton is widely grown.

Besides fuel, the Maldharis use the thorny branches of *Acacia* to make fences around the ness and timber from *Tectona grandis*, *Acacia* and *Zyziphus* in building structures. Over 60% of the 43 ness visited used bamboo (*Dendrocalamus strictus*), branches of *Tectona grandis* and grasses like *Themeda cymberia* for the roofs of their hutments.

Another resource used by the Maldharis is cattle dung mixed with the forest topsoil and sold as manure, making it an important subsistence base for them. The dung of their cattle is also randomly collected from the forest floor, thus depriving the forest of an important soil nutrient.

The people also gather important minor forest products from time to time, e.g. fruits of different trees. Fruits of karamda (*Carissa congesta*) are collected heavily in the summer months and early monsoon season.; jambu (*Syzigium* sp) is collected during the rainy season; fruits of bordi (*Zizyphus* sp.) and amla (*Tamarindus indica*) are collected in winter and the early summer months, and the leaves of billi from winter to early summer months and collected heavily in the monsoons months on religious occasions.

### *Grazing*

The Maldharis living inside the protected area are allowed to graze within the forests, but the people living in the villages outside, or in the revenue lands, do not have the same rights. The grazing rights of the settlement villagers are also restricted by law to a certain extent. Nevertheless, it has been found that people's dependency on the resources of the Gir protected area for fodder is absolute. In fact, the villages located adjacent to the protected

area are using the forests as grazing lands and a large number of cattle from these villages go inside the wildlife sanctuary quite regularly. On paper, there are pasturelands available for each village, but in actuality these are almost non-existent. The villages lack palatable grasses and many pasturelands have been converted into agricultural fields. As such, the shortage of fodder, especially during the dry months, forces the people to send their cattle into the forests.

An interesting observation has been made that wild herbivores share the same niche as the cattle in Gir Forest and foraging competition is quite heavy in many places, especially near the border areas. And where cattle use the Gir Protected Area heavily for grazing, the wild herbivores move into the peripheral regions to raid crops. It has also been seen that areas free from cattle grazing are most free from weed infestations, and the grass growth is also quite abundant.

### *Mining activities*

To assess the present status of mining activities, a preliminary field survey of different mining sites around Gir Protected Area was carried out in August 1998. These sites are situated within 10 km from the forest edge. The following are close to Gir Protected Area: Jinjuva, Natalia, Jalondar, Kansaria, Barbara, Fareda and Picchavi.

Currently, there are six cement and one soda-ash plants operating in the coastal area from Veraval to Jaffrabad. These plants belong to industrial houses and have been operating for 10-15 years. The units need large quantities of raw materials to be processed for production. According to an environmental engineer based at Sutrapada, most of the units are facing a major crisis in obtaining raw material. The lands leased in the nearby areas for extraction of raw material are slowly losing their productivity. As a result, these units are slowly moving towards the village wastelands or pasturelands, and are encouraging the locals to go in for limestone and black stone extraction to supply these units. Although the Department of Geology and Minerals, based in Junagarh under the District Magistrate,



carefully scans the cases for release of fresh proposals to start new mining sites around the forested area, there are a number of illegal mining sites around the Gir Protected Area. Currently, there are approximately 106 mining units in operation, and the number of those that have applied for leases or are running illegally is increasing. Plus, there are at least 24 mines in active operation in the Hermantia village area, which is 10 km from the Gir Protected Area.

### *People's perceptions*

The Forest Department accuses the local people of illegal grazing within forestland, lifting of timber and fuelwood, encroachments, etc., whereas the people complain that the forest department is depriving them of their traditional rights of livelihood. In the study, the authors also studied people's perceptions, the main day-to-day problems that the local people feel that they face in and around the Gir Protected Area which may form the nucleus of present and future conflicts.

At the village level, the context of conflicts involved the following: 1) scarcity of fodder; 2) scarcity of fuelwood; 3) shortage of drinking water; 4) crop damage by wild herbivores; 5) livestock killings and attacks/killings of humans by large felids; 6) absence of compensation for crop damage; and 7) delay in payment and low compensation for cattle depredations by carnivores. In this respect, the people had the following general demands of the forest department:

- Regular alternative arrangements for fodder and fuel from government depots at cheap and affordable rates.
- Allocation of suitable grazing lands.
- Rubble walls around farmlands to be raised to a height of 7 ft, or other forms of inhibitory structures to be erected and infrastructural help from the forest department to prevent wild animals from entering the farmlands.
- Simplifying and speeding up the compensation procedure.

At the town level, the context of conflicts involved: 1) unhygienic living conditions; 2)

lack of communication; 3) lack of electricity (which is impossible to provide within Gir PA); 4) poor drinking water facilities; 5) lack of proper medical facilities and veterinary facilities; 6) lack of opportunity for children's education; and 7) livestock killings by lions and leopards.

The Maldharis have been living in the Gir forests with their livestock for more than a hundred years and have become an inseparable part of the Gir ecosystem, developing a harmonious relationship with nature. No matter how much economic loss from livestock depredations by felid predators is caused, they accept it as a part of living in the forests. However, they have now become somewhat antagonistic towards the protected area authorities and are highly apprehensive about the government's plan to shift them outside the forest area, as had been done to 580 families in 1986. Because once out of the forest, they feel that their traditional livelihood source of cattle husbandry will be endangered in the absence of grazing lands. At the same time, due to exposure to the outer world, the Maldharis have started seeking modern amenities like electricity, etc., which they are not allowed to have inside the protected area.

This, indeed, also reflects the great dilemma the local people face between continuing their traditional way of life and occupation on the one hand, and accepting the better living conditions of the outside world on the other. This is also the challenge that all concerned face – to find an equitable balance between conserving biodiversity and protecting people's livelihood sources.

Every year, a number of cases of human injury and death due to attack by large felids are reported in Gir west and Gir east, creating negative feelings and anger amongst the local inhabitants. To minimize the conflict, the Gujarat Forest Department gives compensation to the affected victims and the staff in the area attends to the case on site at the earliest opportunity, and at times tries to capture the animal.

Cases of lion/leopard attacks on humans around Gir that took place in 1998-99, and

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some cases that occurred in 1997, were analyzed to determine the causes and circumstances in which the attacks took place. Out of 31 cases of human injuries, 16 involved leopards, 7 involved male lions, and 8 involved lionesses. Correlating the number of cases and the distance from the Gir PA boundary where the incident took place showed that 18 cases took place within 5 km of the PA, 5 cases within 10 km, 3 cases within 15 km, 2 cases within 30 km, and 3 cases within 25 km. Three mortalities involving leopards took place in Nandan, Sonpura and Dhrabavad in Una *taluka*, 24 km, 7 km and 6 km respectively from Gir Wildlife Sanctuary.

### Some recommendations

#### *For peripheral forests*

1. Peripheral forests act either as buffer zones or corridors, which help check any direct impact/pressure from grazing and fuelwood collection on the wildlife sanctuary area. These peripheral forests need to be protected and restored where necessary and scientifically managed on a priority basis.
2. Encroachment is a major problem and threat, particularly in the peripheral forests around Gir PA. In fact, since there is no proper demarcation, at many places it is difficult to identify the status of these forests easily. Measures need to be adopted to check the encroachments. The areas need to be surveyed, mapped and properly demarcated.
3. Wood plant species have been observed to encroach in grassland *vidis*. Such growth in grasslands should be discouraged and the plants removed at an early stage or thinned and pruned.
4. Removal of topsoil from the peripheral forests by farmers is a regular practice, which should be immediately checked.
5. There is urgent need for proper watershed management planning and also raising the awareness of the local farmers about the use of ground water and the recharging of existing wells by using rainwater run-off after desiltation. Under the supervision of water management experts, people could be trained in the construction and maintenance of desiltation plants.
6. There is also a lot of mining activity going on close to the peripheral forests. Some local farmers have given over portions of their cultivated fields for extraction of *belas* commonly used in house construction. Such mining activities need to be stopped. The sites of some inactive mines, particularly inside the PA, could be used for the storage of rainwater.
7. Around Gir PA, the number of mega-industries is growing and now moving towards the peripheral forests around Gir in search of raw material. This should be checked. These industrial units draw heavily on the groundwater, which will become a major problem in the near future as the entire Saurashtra region is drought-prone. These industries should be encouraged to install desalination plants, whereby they could use seawater. Moreover, these plants could also help generate power.
8. In the peripheral forest areas, check dams can help maintain soil moisture and increase the groundwater table.
9. The patchy, peripheral forest areas can be developed as nurseries for fruit plants and other local tree varieties, which will help fulfill the people's fuelwood needs.
10. Considering that the grazing area is limited and the number of cattle is more than the capacity of the area, nurseries could also be established for productive local grass species. At the same time, the pastures in the peripheral forest areas could be used for grazing by the villagers' cattle on a rotation basis (Sh Mahesh Singh).
11. Agroforestry, especially involving mango and other fruit plant plantations, could be encouraged around Gir. This would boost the local economy and also help maintain the soil moisture regime in the area. Mango plantations could also be links in the corridor landscape between different peripheral forests around Gir PA.
12. There is need to restore and develop a corridor forest patch between Gir PA and the Mythiala forest area, which has recently been included in Gir East Dhari Division.

*Protection measures to minimize fatal risks from large felids:*

1. Whenever people learn of the presence of a large felid or predator in their fields, or see fresh pugmarks, they must immediately inform the nearest range office for help and possible rescue of the animal before any mishap can occur. They should take all due precautions and not harass the animal.
2. In areas where large felids have been sighted, people should take precautions and move about in groups of 2-4 persons. A single person is always an easy prey.
3. In the villages around Gir, the local villagers need to be made aware of the safety benefits of having toilets located in the house.

*Ex-gratia for human injuries and livestock kills by large felids:*

1. The compensation plan regarding man-wildlife conflicts needs to be revised. At present, persons suffering injury from wild carnivores are offered financial assistance for treatment only. Unemployed or landless laborers should be given appropriate compensation during the period of recovery.
2. A village-level group insurance scheme should be introduced for immediate relief for medical care to victims injured by felids.
3. Introduce a village-level self-funded compensation scheme generating funds by pooling resources of cattle holders. Richer farmers could contribute more than smaller ones.
4. The District Forest Office should oversee the compensations payments instead of the respective division offices in order to speed up the processing.
5. Livestock insurance for costly cattle could be procured on an individual basis.

*Crop damage problems:*

1. Instead of fencing individual farmlands, a complete block of several farmlands should be enclosed, especially near the sanctuary boundary where incursions are more likely.
2. Farmers should seek bank loans to finance the fencing.

3. In areas with low rainfall, cactus can be planted next to the rubble walls, and in areas with more rainfall agave can be planted.
4. The rubble wall around Gir PA should be restored and maintained.
5. In order to check the breeding and population growth of nilgai, the dominant male should be tranquilized and sterilized.
6. Culling of wild animals is not allowed under the WLP Act; this needs to be reviewed. The local people are very much in favor of killing problematic nilgai and wild boar.
7. There is need for a proper dialogue between the victims (local farmers), local politicians and other related people affected by crop damage.
8. Since there is no compensation for crop damage, farmers should be encouraged to opt for group insurance.

*Conflict zones:*

1. More cases of livestock kills and human injuries are reported from outside the Gir PA than from inside it. This may be due to the straying of wild animals. People in these more sensitive areas should learn from the Maldharies how to co-exist with wild animals.
2. People should stop chasing and harassing wild animals that have strayed outside the PA. The Range Office must be informed to take care of such animals.
3. Volunteers from the villages should keep track of the movement of large felids in their respective areas and inform the concerned authorities.

*Authors' addresses: Dr. Satya Priya Sinha, Project Coordinator SOS Rhino Project, c/o Wildlife Institute of India, Chandrabani, Dehra Dun – 248001, Uttaranchal State, India, e-mail: [sinhasp@hotmail.com](mailto:sinhasp@hotmail.com); Bharat J. Pathak, IFS, Conservator of Forest (Wildlife), Junagadh Circle, Office of the Conservator of Forest, Sakar Bagh, Jundagadh, Gujarat, India; P.P. Rawal, Deputy Conservator of Forest (Wildlife), Gir Wildlife Sanctuary/National Park, Sasan Gir, Distt Junagadh, Gujarat, India.*

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# Forest News

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## ***FOREST CERTIFICATION IN CHINA: LATEST DEVELOPMENTS AND FUTURE STRATEGIES***

### **Background**

China is one of the world's largest wood producing countries. It has also become one of the world's largest importers and exporters of forest products. Over the past decade, China has invested in a number of large processing facilities. Significant quantities of all kinds of wood products are currently being produced and China has quickly become a leading producer of value-added wood products for export. Certification is an increasingly important issue for China, with a view toward maintaining and increasing its market share, particularly in Europe and North America.

Over the past decade there has been a proliferation of certification schemes in different countries and regions and at different levels. China is interested in developing a single, coherent national forest certification strategy, building on the experiences of other certification schemes.

To facilitate this objective, the State Forest Administration (SFA) of China invited FAO's assistance in organizing the workshop: *Forest certification in China: Latest developments and future strategies*. The workshop was organized in collaboration with SFA, the USDA Forest Service, and the Zhejiang Forestry Department (ZFD). The workshop, which was held in Hangzhou, China, 21-23 July 2004, examined the most recent developments in forest

certification from a range of perspectives, both at international and national levels.

The main objective was to provide the Chinese and regional participants with an overview of the various certification alternatives. Secondary objectives were to:

- facilitate the exchange of information on certification issues among participants from throughout the region;
- provide a comprehensive overview of the certification initiatives at national and international levels;
- identify the advantages and disadvantages of certification;
- identify and discuss concerns and constraints related to the development of a Chinese national certification standard; and
- explore the options for establishing a national certification initiative in China.

### **Presentations**

Presentations were made on the following issues: certification schemes (both international and national); mutual recognition; market analysis; and development of a national certification standard. The presentations were followed by group work and the workshop concluded with a panel discussion.

Representatives of the Programme for Endorsement of Forest Certification schemes

(PEFC) and the Forest Stewardship Council (FSC) explained how their certification schemes work and the potential relevance to China. There are several fundamental differences in approach and institutional arrangements between PEFC and FSC. However, they both provide an umbrella structure for schemes and initiatives that operate at national levels. With PEFC, a national certification scheme is developed, whereas with FSC's scheme, a national certification standard is developed on the basis of the global FSC certification standard, although there are some exceptions to this general approach (such as the UK Woodland Assurance Standard, UKWAS). Both certification schemes could provide China with options for international recognition of a Chinese certification standard.

Presentations were also given by representatives of the Malaysian Criteria & Indicators (MC&I), Lembaga Ekolabel Indonesia (LEI) and the Sustainable Forestry Initiative (SFI), from North America. Each presenter provided information on the development process of each scheme, experiences in implementing the scheme and how they have dealt with the issue of labels in the international markets. Valuable lessons can be learnt from the experiences of these countries in the development of national certification schemes. Both MC&I and LEI have worked with FSC to obtain FSC endorsement. MC&I also has become a member of PEFC and is considering submitting its certification scheme for assessment by PEFC. SFI is currently a member of PEFC and is considering submitting its scheme for assessment by PEFC.

The UK Woodland Assurance Scheme (UKWAS) was presented as an example of how a national certification standard could be developed with the consensus of all the relevant forestry stakeholders. This was a unique process, and the standard developed has since been accepted by both FSC and PEFC.

The proliferation of certification schemes has led to numerous calls for formal recognition among the certification schemes on an international level, through so-called "mutual recognition." To date, discussions on this issue have often been antagonistic and polarized, and

have not succeeded in achieving overall mutual recognition. Currently, most experts acknowledge that mutual recognition will be difficult to achieve and, hence, it is not being actively pursued for the time being.

An analysis of international markets indicates that Europe and North America currently represent the most important markets for certified timber products. At present, the most important factors driving forest certification tend to be environmental image (of corporations and countries) and market access (maintenance and increase of market share). Despite initial expectations and promises of "green premiums" for certified products, consumers are reluctant to actually pay extra for certified products, except for certain niche products (e.g. high-value furniture, or musical instruments).

Analysis of the Chinese timber market indicates that demand for timber is increasing rapidly, while at the same time domestic timber production is decreasing (largely as a result of the Natural Forest Protection Programme that restricts logging in much of the country). This has resulted in a large increase of imports, making China one of the largest importers of timber in the world. China has a rapidly expanding industry for value-added products and is a large exporter of products such as plywood, furniture, etc. The main export markets include the United States, Japan, Korea and the United Kingdom. Certified products would be of particular interest to the U.S. and the U.K. markets.

Despite being in the early stages of developing a national certification standard, China has made considerable progress. A draft version of the Chinese standard was presented at the workshop, which consists of 9 principles, 45 criteria and 118 indicators. This standard has mainly been based on the generic FSC standard and the ISO 14001 EMS standard.

Three discussion groups (two for the Chinese participants and one for the international participants) gave the workshop participants an opportunity to explore certification issues more thoroughly. The two Chinese discussion groups considered options for further developing a national forest certification scheme for China.

Issues that were discussed included: who should be involved, what issues still need to be resolved, how to attain international recognition for the certification scheme, etc. Participants in the international group discussed certification developments in their own countries and made observations and suggestions on the China situation.

### **Observations and suggestions for China**

The group of international participants made the following observations and suggestions for China:

- China's efforts to develop a national forest certification standard were applauded.
- It was suggested that that China use its influence on the international timber market wisely, especially with regard to buying timber from other countries. While China will be able to improve domestic forest management through forest certification, it can also have a major influence on the countries from which they import their

timber, by being sensitive to the legality of purchased timber and the sustainability of harvests.

- It was recommended that China establish a regulatory body for monitoring the source of imported logs, some of which currently come from countries with problems related to the legality of the source.
- The importance of the government in developing forest certification was recognized; however, it was recommended that China provide mechanisms and encourage broader stakeholder participation in the process.
- By considering other products such as bamboo and forest food in its certification scheme, China is addressing important aspects of forestry in the country and pioneering new ideas that will be relevant for other countries as well.
- Certification will have several long-term benefits for China, including improving the environmental image of the country.

## ***URGENTLY NEEDED: PROPER PLANNING FOR EFFECTIVE TRAINING IN FOREST HARVESTING***

*“The most critical single requirement for the successful application of reduced impact logging (RIL) on a wide scale in tropical forests is the availability of skilled logging personnel at all levels. The fact that almost no tropical countries presently offer such training effectively dooms their forests to poor logging practices.”* This stark observation was made by Dennis Dykstra in a key presentation made at the 2001 International Conference on the Application of Reduced Impact Logging to Advance Sustainable Forest Management in Kuching, Malaysia.<sup>1</sup> Others have maintained that strong

political commitment is needed first and foremost before we can see substantial improvements in forest harvesting. Notwithstanding the different views on what is most urgently required, there is broad agreement that currently the workforce involved in forest harvesting is inadequately prepared to make the changes essential for reaching the elusive goal of sustainable forest management.

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*logging to advance sustainable forest management*, eds. Enters, T., Durst, P.D., Applegate, G., Kho, P.C.S. and Man, G. RAP Publication 2002/14. Food and Agriculture Organization of the United Nations, Bangkok. pp. 303-311.

<sup>1</sup> Dykstra, D.P. 2002. Reduced impact logging: concepts and issues. In: *Applying reduced impact*

If you re-read Dykstra's claim carefully, you will note that the problem is at least two-dimensional in nature. First, the workforce lacks the essential skills to adopt reduced impact logging. Second, hardly any country in the tropical world is in the position to deliver training effectively.

In fact, Dykstra possibly underestimates the magnitude of the current problem, which is of an even more fundamental nature. Most training in forest harvesting addresses problems related to weak skills. Some are devoted to correcting a lack of knowledge or poor understanding. Virtually none, however, is directed at indispensable attitudinal changes. Other reasons why people do not perform in a desirable manner, such as motivational or organizational issues, are also not addressed adequately. In addition, training needs analyses are rarely conducted properly. This is in part because experts involved in training all too often feel that they know what is needed without even meeting with employees in the forest or office. As a result, many training courses and programmes that do exist have little impact. They often address perceived—but not real—problems.

What guarantee is there that forest operators—whether loggers, supervisors or managers—will actually make use of the knowledge they acquire or the skills they are taught? Hardly any, so long as formal training is not preceded by proper planning and so long as training efforts are measured according to the number of courses offered and number of participants, rather than in terms of increasing competency levels and real behavioral changes.

Training in forest harvesting—as well as many other fields—is an educational process that requires more than just distributing information and developing or strengthening skills. Providing training to adults—especially forest operators—at the workplace is very different from teaching children in the class room. Trainers need to have a good understanding of their clients—the trainees—and their reasons for participating in any course. Above all, effective training requires trainers to have a thorough

understanding of the training process and the role and value of systematic planning.

In the first instance, the need is not for more training, but instead on sensitizing trainers to the qualitative aspects of training such as appropriate training content, instructional techniques and teaching materials. A step-wise and systematic planning process for designing a training course or whole programme is called *training curriculum development*.

Planning for effective training or curriculum development was the main subject of a recent workshop organized by FAO in collaboration with the Forest Department Peninsular Malaysia, under the regional project *Enhancing sustainable forest harvesting in Asia*. The workshop was held in the State of Terengganu, 20-23 September 2004, with an additional day spent at the Forestry Training Unit in Kepong, Kuala Lumpur. Nineteen participants from five countries attended the workshop, with the main objective to provide information on how to plan and design an educationally-sound training activity.

The workshop illustrated simple, yet useful, tools to develop a training curriculum based on trainees' needs and existing competencies. It also emphasized the need to assess the training process to ensure the relevance and appropriateness of a training programme or course. Finally, the workshop indicated to the participants that the careful design and preparation of training is a major activity that usually consumes more time and energy than the actual delivery of training.

Resource persons repeatedly stressed that if the planning phase is underestimated, training success may be severely jeopardized, as trainees may not benefit from the training, do not feel inclined to make use of the new knowledge or skills that they have acquired, or see no need to change their attitudes and behavior.

As the topic of the workshop, *Planning for effective training*, is important not only for the selected few who were able to participate in the workshop, but also for a wider audience, the

main steps of curriculum development are summarized below.<sup>2</sup> The basic steps of the curriculum development include the following:

1. Identify the participants and set a date and location for the training course.
2. Determine training needs.
3. Set training objectives.
4. Prepare and organize training content.
5. Select training methods and techniques.
6. Prepare the lessons plan and training materials.
7. Develop an evaluation strategy.

In the first step, planners need to clearly ascertain who the trainees are. Forest harvesting—including conventional and reduced impact logging—consists of numerous tasks that are often performed by different workers or employees. Although people usually talk casually about logging, a “logger” as such, basically does not exist. A variety of people are involved in harvesting operations and they all need different knowledge and skills appropriate for the tasks they perform. Consequently, trainers need to recognize the differing training needs of the different groups.

Trainers also need to ascertain the approximate number of participants—avoiding attempts to train too many people at once. Another important consideration is the best time of the year for training—which does not mean the time most suitable for the trainers, but rather the most fitting for the trainees.

Finally, the location for training needs to be determined. Generally, it is more effective to provide training in the field—in the area where logging takes place—rather than at a central location. The Forestry Training Center in Terengganu operates a mobile training unit, which enables training, especially in directional felling, as close as possible to the work site. The Sarawak Timber Association operates its training programme for tree fellers and tractor drivers in a similar fashion.

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<sup>2</sup> Detailed guidance on curriculum development is available in FAO. 1993. *Planning for effective training*. Rome, Food and Agriculture Organization of the United Nations.

The most effective way to determine the relevance of training content (i.e. subject matter or topics) is to conduct a needs analysis, which determines whether there is a discrepancy between the desired and actual performance of trainees. All too often it is assumed that trainees know next to nothing and valuable resources are wasted by telling them what they already know. Also, sometimes people are taught skills that they do not need in their jobs. Proper training needs analyses help to avoid such mistakes, which can easily lead to discontented trainees.

Once training needs are clarified, they need to be translated into appropriate objectives. Objectives provide trainees with a clear understanding of what they will be expected to do as a result of the training. A performance objective, for example, may state that upon completion of the course the tree fellers will be able to fell a tree in a predetermined direction with an error margin of +/- 20 percent. Objectives also help both trainers and trainees evaluate the learning that has taken place through instruction. For instance, in the directional felling example, if the error margin is consistently above 20 percent, then the trainee has not learned sufficiently and is not competent in directional tree felling.

The established objectives basically determine the content of the training. If the broad objective is to implement a code of practice for forest harvesting, for example, then the following topics would have to be included in a training programme:

- pre-harvest inventory and mapping of individual crop trees;
- pre-harvest planning of roads, skid trails, and landings;
- vine cutting;
- controlled felling and bucking techniques;
- construction of roads, landings, and skid trails;
- log extraction; and
- post-harvest assessments.

Currently, the most common training methods are lectures and assigned readings. These can be effective for a particular audience, such as university students or academics, and if the objective is to transfer knowledge. Imagine,



however, a lecture on directional tree felling or chainsaw maintenance. Such an approach would be highly unproductive. Not only are tree fellers and many other forest operators not accustomed to sitting in lecture halls, upgrading skills is much better done in the forest through demonstrations. Case studies, role plays, discussion groups and field visits are all methods that can be used more effectively. They all have their advantages and disadvantages, underscoring the importance of selecting methods with great care.

The same is true for the preparation of training materials. Hand-outs and manuals are common, but they are only the most prominent types of printed materials. Others include workbooks, magazines, assignment sheets, study guides and pamphlets. Audio-visual teaching aides, such as videotapes, flipcharts, slides and overheads are also important tools. It is important to remember that a mix of materials makes training more interesting and increases the retention of information.

At this point, all of the previous decisions and efforts are pulled together into lesson plans, which serve as a written record of how the training will be conducted. Lesson plans provide information on: course topics; training methods; duration; and needed resources.

Lesson plans also help the trainer to stay on course with the training. Without a plan, the

training may become very disorganized and lead to the dissatisfaction of trainees.

Setting out an evaluation strategy is the final step of the curriculum development process. It is considerably more difficult to measure actual learning that takes place than to determine what trainees think about the training and trainers. While the latter is important too, more important is to measure progress and to know how much trainees are learning during the course of the training and at the end. It is not sufficient to administer a test at the end of the training and provide each participant with a certificate. Trainees have to be tested at the beginning of the training and at the end, or progress cannot be measured. The final assessment determines whether trainees have the skill to perform a certain task or whether they have reached the competency to do a certain job. While most tests are written exams or performance tests that allow the measuring of knowledge and skills, observations can also be used to detect changes in attitudes and behavior.

Curriculum development provides the framework and foundation for effective training. It is a crucial ingredient to building a competent and dedicated workforce required to effectively implement codes of practice for forest harvesting and to achieve sustainable forest management. Without effective training, forests are doomed to poor logging practices and without proper planning, training will not be as effective as it should be.

It is only when the last tree has been cut  
When the last fish has been caught  
When the last river has been poisoned  
That you will realize that you cannot eat money.

*Cree Indian saying in the USA*

## **NATIONAL FOREST PROGRAMMES— SUPPORT FROM THE FACILITY**

The National Forest Programme Facility (in short, Facility) has been providing support for the development and implementation of national forest programmes (nfp) for more than two years. The number of countries benefiting from the Facility support continues to expand. Currently, the Facility is active in 36 countries in Africa, Asia and the Pacific, and Latin America, and also supports two sub-regional organizations in Central America. In the Asia-Pacific region, seven countries are partners of the Facility. Country-level support and the activities that countries have proposed are diverse. Examples include:

### *Indonesia*

The Facility is assisting in the transparent and participatory preparation of a National Forest Statement. It is hoped that the Statement will provide guidance to forestry stakeholders and replace, to a certain extent, the ever-changing *ad hoc* political decrees that have led to a considerable degree of uncertainty amongst forestry stakeholders. A first step in the preparation of the Statement is the organization of four regional workshops (Sumatra, East Java, Sulawesi and West Papua), which will provide a forum for airing and building consensus on regional forestry issues and the contribution that forestry can make to poverty reduction. To coordinate the workshops, the preparation of the Statement and other activities under the national forest programme, the Ministry of Forestry established an nfp secretariat in July 2004.

For more information on the nfp in Indonesia, please contact Ms. Dewi Febriani ([wienny2000@yahoo.com](mailto:wienny2000@yahoo.com)).

### *Philippines*

The Facility is supporting a two-pronged approach designed to increase the effectiveness of the Community-Based Forest Management (CBFM) Programme. The two cornerstones are:

- 1.) development of a CBFM Implementation Strategy; and
- 2.) strengthening capacities at different levels:
  - community (field) level;
  - institutional implementation (project) level; and
  - policy development and procedure formulation (programme) level.

Under the partnership agreement, six case studies of selected CBFM sites have been undertaken by representatives of non-government organizations and universities. The progress of the research was reviewed during a workshop in May 2004, attended by the members of the CBFM Advisory Group and representatives of NGOs, universities and research institutes. During a second consultative workshop (24-26 June 2004), the study results were presented, discussed and validated by representatives from people's organizations from Luzon, Visayas and Mindanao, NGOs, the research community, the Department of Environment and Natural Resources and the CBFM Advisory Group. Moreover, the workshop participants identified and discussed recommendations to enhance the CBFM implementation strategy. The study results and the opinions aired are currently being synthesized and will be published in the form of an overview document with unambiguous recommendations for further discussions. The document will be a major input to regional workshops that will be organized by Regional CBFM Federations in early 2005. For more information on the activities, please contact: Ms. Remy Evangelista ([cbfmpremy@edsa.com.ph](mailto:cbfmpremy@edsa.com.ph)), or you can visit the website [www.fao.org/forestry/nfp](http://www.fao.org/forestry/nfp), where you will find copies of the study reports on the *Progress* page.

### *China*

The Chinese Academy of Forestry (CAF) has taken the lead in two activities. In collaboration with the State Forestry Administration (SFA), it

is formulating a forestry sector strategy for Ningxia Hui Province. In a first step, the Research Institute of Forest Policy and Implementation of CAF is preparing five thematic papers that will provide, in a coherent and comprehensive manner, background information for the preparation of the strategy. A second agreement between the Facility and CAF covers the design of a website and communication strategy to support sustainable forest management in China. The purpose of the proposed activities is to strengthen capacities in providing information to different stakeholders at the national and international levels. The first phase of the three-year activity commenced with a multi-stakeholder workshop in August 2004. It will focus on the establishment of a framework for a website, identification of user needs, design of a website structure, training in website development and maintenance, and preparation of basic information on Chinese forestry to be uploaded in both the Chinese and English languages. For more information on the activities or on China's national forest programmes, please contact Mr. Xia Jun ([xiaj@forestry.gov.cn](mailto:xiaj@forestry.gov.cn)).

Partnerships with the Facility were launched in May 2004 in Vanuatu and in August 2004 in

Pakistan. Vanuatu has taken the first steps toward drafting a forest policy implementation strategy, while in Pakistan support will cover the establishment of a forest policy forum, or similar mechanism, for multi-stakeholder involvement in policy analysis and formulation, and the generation and dissemination of improved and up-to-date information on forestry issues. In both countries, partnerships are still in their infancy, but if the participation of stakeholders in the launching workshop is any indication, the interest is considerable.

For more information on national forest programmes in the Asia-Pacific region, and/or the National Forest Programme Facility, please contact:

*Mr. S. Appanah,*  
*NFP Advisor for Asia and the Pacific,*  
*FAO/RAP, Bangkok, Thailand.*  
*Tel: 66-2-697-4136; Fax:(66-2) 697-4445;*  
*E-mail: [simmathiri.appanah@fao.org](mailto:simmathiri.appanah@fao.org)*  
*or*

*Mr. T. Enters,*  
*NFP Facilitator,*  
*FAO/RAP, Bangkok, Thailand*  
*Tel: 66-2-697-4328; Fax: (66-2) 697-4445;*  
*E-mail: [thomas.enters@fao.org](mailto:thomas.enters@fao.org)*

## ***REVISED MASTER PLAN FOR FORESTRY DEVELOPMENT IN THE PHILIPPINES***

*by A.P. Carandang, National Project Director & CBFM Specialist*

The forestry sector is the centerpiece of the Philippines' natural ecosystems. Although the sector's productivity has been declining, its contributions to the economy in terms of added value, creation of jobs, and the provision of biomass fuels are still significant. Its continued development is a pre-requisite to sustained growth in agriculture and other industries.

However, the sector continues to reel from many threats to forest resources, among which are: tremendous pressure from an increasing population in search of land to till and forest resources to use; the loss of vital watershed functions and biodiversity; and inadequate forest development, management and conservation efforts.

In 1989-1990, the Philippine Government, with the assistance of the Asian Development Bank (ADB) and the Finnish International Development Agency (FINNIDA), formulated a 25-year Philippine Master Plan for Forestry Development (MPFD), designed to revitalize the forestry sector and bring it back to its former significant role in national development. The formulation was completed in 1992.

Since the MPFD was formulated, several new developments and concerns have emerged in forestry, both in the local and international fronts. These issues, which include forestry and land-use implications related to climate change, the increasing recognition of the role of forests and forestry in poverty eradication and support of sustainable livelihoods, etc., were not foreseen at the time the MPFD was formulated. Subsequent reviews conducted by ADB in 2000, and by the United Nations Development Programme (UNDP) in 2001, recommended the review and revision of the MPFD, taking into consideration the changed environment and priorities in the Philippines and other emerging trends in local and international forestry. In September 2002, with funding support from UNDP, a team was assembled by FAO to review and revise the 1990 MPFD. The project reviewed the MPFD implementation and accomplishments, and identified programs to improve the performance of the forestry sector.

### **General Assessment of 1990 MPFD**

One of the most visible accomplishments of the 1990 MPFD is the Community Based Fire Management (CBFM) project, which falls under the People Oriented Forestry Program. Another area where the 1990 MPFD exceeded its target is in the area of protected area and biodiversity conservation. Similarly, there are many positive developments under the program of soil conservation and watershed management.

However, in terms of other key program targets, most were under-achieved or posted no achievements at all. Among these programs are: delineation and marking of forest boundaries;

identification of production and protection forests; establishment of forest plantations; and rationalization of forestry education in the country. Apparently, the implementation of the 1990 MPFD was beset by many problems and constraints. There is a consensus among the sector stakeholders that forestry sector policies were outdated. This is compounded by the inadequacies of legal instruments and consequent weaknesses of public forest administration and management in the country. Other implementing problems included inadequate planning and programming, and funding uncertainties. Contributing to the problems was the absence of real awareness and commitment on the part of decision makers to recognize forestry as a significant economic sector.

### **Potentials and strengths of the sector**

In spite of all the constraints, forestry in the Philippines has considerable potential for contributing to the development of the country – both economically and ecologically. Several potential areas were identified, such as: i) putting all forest areas under appropriate forest management systems that seek to obtain optimum economic and environmental benefits for forest communities, other stakeholders, and society in general; ii) expanding the area under forest cover through plantation establishment, enrichment planting and assisted natural regeneration; iii) enhancing access to residual forests within production forest areas to improve the wood supply; and iv) revitalizing the forest-based industries through rationalization and appropriate incentives, improved primary and down-stream processing, and new product development. In addition, it has several significant strengths that are important and relevant to supporting sustained development of the forestry sector. These include a tradition and history of forest management; existence of a reasonable extent of natural forests available to support biodiversity and environmental objectives as well as production of goods and services, existence of sectoral institutions and a large number of well trained and committed

professions and technical personnel. Their performance can be considerably improved through retraining and refresher training.

### **The Revised Forestry Master Plan for Forestry Development**

A synthesis of the various subsectoral visions identified during several public consultations revealed some common aspirations among the stakeholders. These included participatory management of watersheds and forest resources for the common good, and the desire to be globally competitive in forest plantations and utilization. From these, a common vision for the sector has been drawn up as given below.

***Forestry Sector Vision:** Sustainably managed watershed and forest resources providing environmental and economic benefits to society with globally competitive industries contributing to the national economy and uplifting of upland communities' welfare.*

Among the general objectives formulated to pursue this vision was the sustainable management of watersheds/forests through active participation of the stakeholders, globally competitive industries, excellent forestry education and training, and enhancement of the protective values of forests and biodiversity. Overall, the vision seeks to select objectives that improve the quality of life for forest-dependent people, improve the decision making process, and enhance the effectiveness of the forestry institutions.

To enable such a vision and achieve the general objectives, the revised FMP identified strategic targets as follows:

- a fully responsive and capable public forest administration (PFA) within 10 years;
- forestry and related policies harmonized within 5 years;
- poverty in the uplands reduced by half within 15 years;

- all forestland boundaries defined and marked, production and protection forests identified, surveyed and segregated within 10 years; and
- a healthy, vigorous and responsible forest-based industry within 5 years.

Programs and actions were then formulated along the areas of policy and legislation, which were then refined into the top 10 strategic priority programs as follows:

- Policy Reforms and Institutions Development:
  - harmonization of other policies affecting the sector;
  - retrofitting the PFA as a line agency – firstly a land management agency and secondly as a forest resources management agency – with separation of the authority and enterprise functions of the PFA;
  - capacitation of forestry institutions and institutional reforms; and
  - National Council for Sustainable Forestry (NCSF).
- Prioritization of watershed integrated land use planning, simultaneous with forest boundary delineation.
- MIS, IEC and R&D enhancement.
- Sustainable management of residual forests and other natural forests, arresting forest destruction.
- Forest area expansion through plantation development, ANR and other means.
- Protected area and biodiversity conservation.
- Forest industries rationalization and development.
- Sustainable management of grazing lands.
- Full development of M&E and C&I systems for all forest types and management systems.
- CBFM as a cross cutting strategy in all forest management systems.

## ***ENHANCING NETWORKING OPPORTUNITIES AMONG MODEL FORESTS***

More than 30 participants took part in a regional meeting in Lin'an City, China, to review the status of model forest development and discuss opportunities for enhancing networking among model forests in the region. The meeting, which was held 21-23 September 2004, was organized by the International Model Forest Network Secretariat (IMRNS), FAO, and the Chinese Academy of Forestry (CAF). Participants included representatives from seven model forests in Asia, the Samar Island (Philippines) Biodiversity Project, and supporting international organizations (IMFNS, FAO, IDRC, and Venture for Fund Raising). A regional workshop on strategic and operational work planning was organized prior to the network meeting for selected participants.

### **Update on model forest activities in Asia**

Progress has been positive at all of the model forests. Partnership organizations continue to be strengthened at all the model forests and field activities have been especially impressive in model forests in China, Myanmar and the Philippines.

In addition to the four model forests initially supported under the Regional Model Forest Project, additional model forests are currently being developed in India (Kudagu) and Indonesia (Berau and Margowitan). These model forests have expressed strong interest in joining the Regional and International Model Forest Networks. Indonesia plans a formal launching of the Margowitan Model Forest in December 2004, just prior to hosting the next regional model forest workshop.

### **Opportunities for enhancing networking among model forests in Asia**

The meeting considered the benefits, costs, and various approaches for enhancing networking among the model forests in the region, based on regional experience to date, the experiences of the Canadian Model Forest Network, and FAO's experience in supporting networks over the years. Given the reduced level of international funding for model forest development in the region – at least in the near term – discussion emphasized cost-effective approaches for networking.

Various options for network management, support, and governance were discussed, as well as the need to build links between model forests and other organizations. It was suggested that a strategy for networking among the model forests in Asia be developed, and it was recommended that a small working group be established with support from IMFNS to facilitate the formulation of a draft strategy.

### **Preparations for upcoming Regional Model Forest Network Workshop on financial sustainability**

The Government of Indonesia and Perum Perhutani will host a "Regional Model Forest Network Workshop on Financial Sustainability," 6-10 December 2004. The workshop will be supported by IMFNS, FAO, IDRC, the Indonesian Ministry of Forestry and Perum Perhutani. The focus of the workshop will be on fund raising and efforts to broaden the financial support for model forests. The technical content of the workshop will be facilitated by resource persons from Venture for Fund Raising – an NGO based in the Philippines with extensive experience in analyzing funding needs and opportunities for non-profit organizations.

## RILSIM VERSION 2.0 AVAILABLE

In mid-2003, the first version of RILSIM (**R**educed-**I**mpact **L**ogging **S**IMulator), a software package for financial analysis of alternative logging systems, was released. Since then, more than 500 copies of the software have been distributed worldwide. In addition, more than 500 copies have also been downloaded.

As is the case with any new software, the users of RILSIM experienced several minor glitches or flaws. During a series of five promotion and training seminars, organized under the umbrella of the Asia-Pacific Forestry Commission (APFC) and held in Malaysia in late 2003, participants attending the events provided very constructive comments and suggestions on how to make RILSIM even more user-friendly than it already was. The RILSIM Steering Committee reviewed the more than 50 suggestions received in early 2004. Most were considered for the development of an updated version of the software.

Asking for an updated software package is a lot easier than actually doing the work. It took about six months to incorporate all the modifications. Finally, RILSIM version 2.0 has been released. If you would like to receive RILSIM 2.0 please contact:

*Gary Man*

*Asia and the Pacific Coordinator*

*1099 14th St NW, Suite 5500W*

*Washington, D.C. 20005*

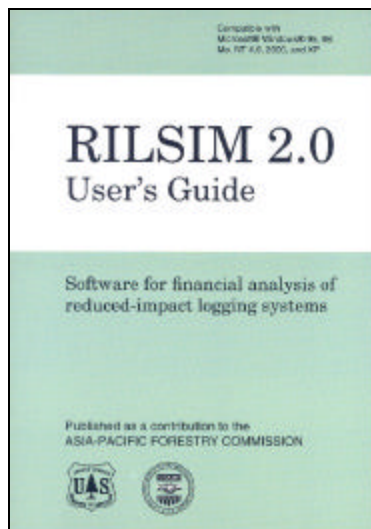
*Tel: 202-273-4740; Fax: 202-273-4750*

*E-mail: [gman@fs.fed.us](mailto:gman@fs.fed.us)*

If you prefer to download the program and the User's Guide, it is available on the following website:

<http://www.blueoxforestry.com/RILSIM/index.htm>

We hope that you find RILSIM 2.0 even more useful than the previous version and that it helps in identifying and calculating the financial costs and benefits incurred by switching from conventional to reduced impact logging.



## NEW RAP FORESTRY PUBLICATIONS

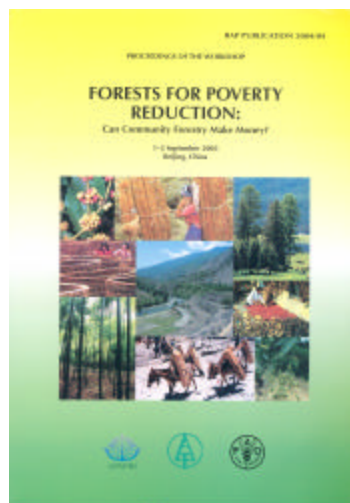
### PROCEEDINGS OF THE WORKSHOP “FORESTS FOR POVERTY REDUCTION: CAN COMMUNITY FORESTRY MAKE MONEY?”

RAP Publication 2004/04

More than 1.2 billion people in developing countries depend on farm trees to generate food and cash; another 350 million people live in or next to dense forests and rely on them for subsistence or income; and 60 million indigenous people live in and depend entirely for their survival on the tropical rain forests of South America, Asia and Africa. This clearly emphasizes how strongly human beings are dependent on trees and forests for survival.

Among the various forestry practices, community forestry provides the greatest source of support for rural people. The traditional view of community forestry is one of a subsistence role. But changes are needed on several fronts. New and innovative means have to be formulated so that community forestry can become a major source of income, particularly to marginalized communities. Sustainable forest management, marketing, processing and value addition to forest products are some areas for further exploration.

Community forestry can offer great opportunities. It can provide an ideal mechanism for the state to share resources with the poor, and at the same time conserve the environment and alleviate poverty. The state would not only transfer resources to the poor, but management responsibilities as well.



These are some of the issues that were discussed in Beijing, China, 1-3 September 2004, at the workshop “Forests for Poverty Reduction: Can Community Forestry Make Money?” These proceedings are a compilation of the experiences of many countries in the Asian region in implementing community forestry and should be a valuable source information for professionals and other interested parties.

*“The frog does not drink up the pond in which he lives.”*

*Native American proverb*



## **ASIA-PACIFIC FORESTRY CHIPS AND CLIPS**

### **VIETNAMESE NATIONAL PARK RECEIVES WORLD HERITAGE STATUS**

The Phong Nha and Ke Bang National park became the fifth national park in Viet Nam to receive World Heritage status. The park is located in the central Quang Binh province, 400 kilometers south of Ha Noi. The site is home to the oldest karst formations in Asia. It boasts a range of spectacular caves and has one of the world's longest underground rivers, which is 8 kilometers long. It is hoped that the World Heritage listing will boost tourism in the area.

– *Vietnamese English Newspaper* –

### **VILLAGERS SET TO USE SPACE DATA IN INDIA**

A pilot project to establish village information kiosks to disseminate data on natural resources, land cropping, water resources and land use is being established by the Indian Space Research Agency (ISRO). Villagers will be able to use the data to locate wells, for the reclamation of land and for general resource management activities. The project is set to commence in Karnataka.

– *Bhumika Kulkarni, Times News Network* –

### **TIMBER YIELD TOOLBOX**

The U.K. Department for International Development and the Oxford Forestry Institute (OFI) have developed an Excel-based tool for regulating forest timber yield in mixed tropical forest “using minimal data.” According to OFI, the tool, called Myrlyn (Methods of Yield Regulation with Limited Information), “will be particularly useful for obtaining a reasonable estimate of a sustainable yield when the only data available is a single inventory.” The software is available for free download at: [www.myrlyn.org](http://www.myrlyn.org) or contact: Ms. Nell Baker, OFI, Department of Plant Sciences, South Parks Road, Oxford OX1 3RB, U.K.; E-mail: [nell.baker@ntlworld.com](mailto:nell.baker@ntlworld.com).

– *ITTO Tropical Forest Update* –

### **WEST JAVA NEEDS 1.7 BILLION TREES FOR REFORESTATION**

According to the Sunda Environment Observation Board, an NGO based in West Java, an analysis of satellite photos indicates that the deforested area in West Java reached 600,000 hectares in 2002. This is approximately 75 percent of the total forest land. It was estimated that some 1.7 billion trees would be needed to restore the forest area in the province.

– *The Jakarta Post* –

### **FIVE NATIONS CREATE FOREST TRUST FUND**

Five countries, including Viet Nam, have set up a fund to help improve management and allocation of official development assistance and execute forestry projects in Viet Nam.

The Netherlands, Finland, Switzerland, Sweden and Viet Nam signed a memorandum of understanding for the Trust Fund for Forest; while the five nations have already pledged contributions to the fund, more partners and donors are expected to join in the future.

The fund will be strictly supervised by international partners and donors and is considered an important step in protecting forests and implementing the 5 million hectare reforestation project. It will assist in implementing the country's forestry policies.

– *Viet Nam News, June 28, 2004* –

### **FOREST ISSUES FEATURE IN AUSTRALIAN ELECTION**

Debate over how to best manage forests in the Australian state of Tasmania featured prominently in the recent Australian election. Prime Minister John Howard, whose conservative coalition won the election, vowed to preserve an additional 170,000 hectares of old-growth forest from logging, but promised that no timber industry jobs would be lost under

the proposal. Mr. Howard's rival, Mark Latham, had called for more sweeping proposals to put ancient forests of Tasmania off limits to logging.

– *BBC News* –

### **AUGUST FOREST FIRES SWEEP ASIA**

Major forest fires swept many areas of Asia in the month of August. More than 750 fires burned over 31,000 hectares in the Russian Far East. Fires also burned large areas in Kalimantan and Riau, in Indonesia, causing haze problems locally and in neighboring Malaysia and Singapore.

– *Itar-Tass and The Jakarta Post* –

### **TIGHTER CONTROLS ON TRADE OF RAMIN AND AGARWOOD APPROVED BY CITES**

At the recent Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), convened in Bangkok in October 2004,

decisions were approved to list ramin (*Gonystylus* spp.) and agarwood (produced primarily by species of *Aquilaria* and *Gyrinops*) on CITES Appendix II. Such listing indicates a species is at risk from uncontrolled international trade. Under the Appendix II listing, import and export is controlled through a permit system intended to verify that shipments come from harvests that do not endanger the species.

– *Bangkok Post and TRAFFIC press release* –

### **CHINA'S FURNITURE EXPORTS CONTINUE TO GROW**

Despite facing new anti-dumping penalties on exports to the United States, Chinese furniture production and exports continue to expand rapidly. According to China Customs, furniture exports in the first half of 2004 topped US\$4.93 billion, an increase of 42 percent over the same period in 2003.

– *ITTO Tropical Timber Market Report* –

## **FRA 2005 REVIEW AND TRAINING WORKSHOP**

The Regional Review and Training Workshop of Asia-Pacific Countries for Forest Resource Assessment 2005 will be held in Bangkok, Thailand, 23-26 November 2004, at the FAO Regional Office for Asia and the Pacific.

Thirty countries are expected to participate in this meeting: Afghanistan, Australia, Bangladesh, Bhutan, Brunei, Cambodia, China, DPR Korea, Fiji, India, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Solomon Islands,

Singapore, Sri Lanka, Thailand, Timor-Leste, Vanuatu, Viet Nam and U.S.A.

The objectives of the meeting are as follows:

- to technically review the draft "FRA 2005 Country Reports" of each of the participating countries;
- to identify major constraints, if any, and suggest ways to address these;
- to assist and technically guide countries with major reporting problems; and
- to develop national work plans for final submission of country reports to FRA 2005.

## FAO ASIA-PACIFIC FORESTRY CALENDAR

18-19 October 2004. **World Food Day Celebration and Meeting of the Regional Alliance Against Hunger.** Bangkok, Thailand. Contact: P. Mudbhary, Policy Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4236; Fax: (662) 697-4445; E-mail: [Purushottam.Mudbhary@fao.org](mailto:Purushottam.Mudbhary@fao.org)

19-21 October 2004. **Development of an Asia-Pacific Strategy for Eucalyptus Rust.** Bangkok, Thailand. 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](mailto:Patrick.Durst@fao.org)

23-26 November 2004. Bangkok, Thailand. **Regional Review and Training Workshop of Asia-Pacific Countries for Forest Resource Assessment 2005.** Contact: M. Kashio, Regional Forestry Resource Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand; Tel. (662) 697-4141; Fax: (662) 697-4445; E-mail: [Masakazu.Kashio@fao.org](mailto:Masakazu.Kashio@fao.org)

25-28 November 2004. Bishkek, Kyrgyzstan. **First Central Asia Forestry Congress.** Contact: Tyratbek Musuraliev, Chairman, State Forest Service of the Kyrgyz Republic; Tel. +99631261-00-16; Fax: +99631261-13-96; E-mail: [forest@bishkek.gov.kg](mailto:forest@bishkek.gov.kg)

29 November – 2 December 2004. Santiago, Chile. **Twenty-second Session of the International Poplar Commission.** Contact: J.B. Carle, Secretary IPC, FORM, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; E-mail: [Jim.Carle@fao.org](mailto:Jim.Carle@fao.org)

6-10 December 2004. **Regional Model Forest Network Workshop on Financial Sustainability.** Supported by IMFNS, FAO, IDRC, the Indonesian Ministry of Forestry and Perum Perhutani. 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](mailto:Patrick.Durst@fao.org)

8-10 December 2004. **Asia Forest Partnership meeting.** Tokyo, Japan. 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](mailto:Patrick.Durst@fao.org)

11 December 2004. **International Mountain Day Celebration.** For further information, please visit: [www.mountainpartnership.org/imd/imd.html](http://www.mountainpartnership.org/imd/imd.html)

14-18 March 2005. Rome, Italy. **17<sup>th</sup> Session of the Committee on Forestry.** Contact: Doug Kneeland, Programme Coordinator, Programme Coordination Unit, FAO Headquarters, Viale delle Terme di Caracalla, 00100 Rome, Italy; E-mail: [Douglas.Kneeland@fao.org](mailto:Douglas.Kneeland@fao.org)

26-28 July 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](mailto:Patrick.Durst@fao.org)

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## 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)
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  - APANews