



### Black-Necked Crane

### Annual Count 1996

The annual black necked crane winter count is possibly the longest ongoing project undertaken by the RSPN.



#### ON VIEW

#### The Royal Society for the Protection of Nature

coordinates and develops activities to raise environmental awareness among all levels of people, the accent being on the young, and to educate them about the hazards of bio-degradation.

In this issue of the Thrung Thrung, we provide a glimpse of some of our diverse undertakings which range from the perennial black-necked crane count to the creation of a nature interpretation centre, from pre-feasibility studies on national water quality monitoring to the setting up of nature clubs in schools on a kingdom-wide basis.

You will also find news of the region plus other features, essays, and information of environmental import, all adding up to what we hope will make appealing and provocative reading.

#### Information in re publication

Name: Thrung Thrung  
Periodicity: Bi-annual  
Number of copies: 500  
Editor: J M Chiramal  
Artist: Tshering Penjor  
Lay Out: Karma Delma

Printed by  
The Royal Society  
for the Protection of Nature

The following RSPN staff participated in this year's count at Bumthang and Tashi Yangtse: Messrs Lam Dorji, Tshering Penjore, Karma Lotey and Hishey Tshering.

#### What follows is a brief recounting of the trip.

#### 15-1-96

Departed Thimphu. Camped at Gyetsa in Bumthang District.

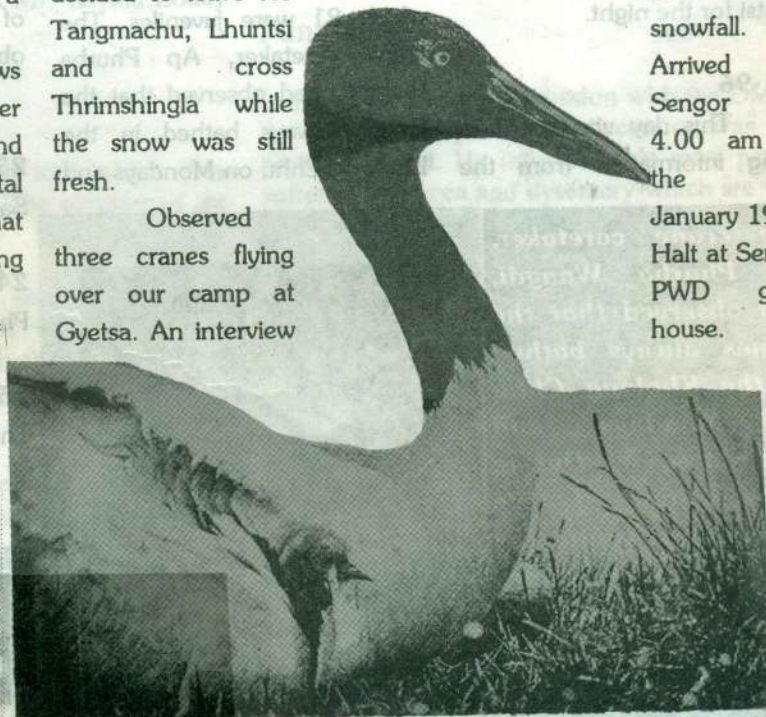
#### 16-1-96

On account of falling snow, it was not possible to count the cranes in Gyetsa. We decided to leave for Tangmachu, Lhuntsi and cross Thrimshingla while the snow was still fresh.

Observed three cranes flying over our camp at Gyetsa. An interview

with locals revealed that seven cranes were noticed in Chamkhar town area, which were reportedly chased away by some crows. It was also reported that the cranes (more than the present figure in Bumthang) had earlier roosted on the banks of the Chamkharchhu. However, since the establishment of a sawmill in the vicinity, the cranes changed their roosting area and their numbers also had declined steadily.

It took 17 hours to reach Sengor from Gyetsa due to heavy snowfall. Arrived at Sengor at 4.00 am on the 17 January 1996. Halt at Sengor PWD guest house.



**17-1-96**

One Ap Chimmi Rinzin, a local from Sengor, hitched a ride with us till Limethang. In response to our enquiries on wildlife sightings, he informed us about the presence of wild dogs, which were assumed to be extinct due to the increase in the boar population. Ap Chimmi himself had seen a pack of five wild dogs in Sengor. Further he had information about seven wild dogs killing two calves in Limethang. Arrived at Tangmachu in the evening. It was also very encouraging to learn that the villagers were happy to welcome the return of the wild dogs contrary to the days when they almost wiped out the wild dogs into extinction by poisoning the carcass of the cattle that were killed by these dogs.

Camped at Tangmachu, Lhunsti for the night.

**18-1-96**

This day was spent in getting information from the

locals on the black-necked cranes. The cranes only stopped at Tangmachu while on transit to some other area, most probably Gyetsa or Thangbi in Bumthang. We also learned that the cranes halted at Tangmachu for a maximum of a week only. This year, seven cranes were sighted but stayed only overnight.

**19-1-96**

Drove towards Tashi Yangtsi.

**20 & 21-1-96**

The Sharpop Losar fell on these days and hence we were not able to meet our crane caretaker. So nothing much was done on these two days as everyone was in a festive mood.

**22-1-96**

Bomdeling. A total of 144 cranes were counted of which 21 were juveniles. The crane caretaker, Ap Phurba Wangdi, had observed that the cranes always bathed in the Kholong Chhu on Mondays and

Saturdays. During these days, if the weather was sunny, the cranes would dance and they seldom flew away from their roosting area.

During the flash flood in the summer of 1994 not only was the feeding area of the cranes washed away but also the foot path used by the villagers. As a result, another footpath came up which encroached upon the roosting area of the cranes and thereby disturbed the birds. The matter was put up to the local administration and a new footpath was developed. However, the people still used the path which passed through the roosting area as it was shorter. A sign board was erected by Ap Phurba and the Forest Ranger was authorised to restrict the people from using this route. Ap Phurba was empowered to collect a fine of Nu.250 from anyone not obeying this law.

**23 -1-96**

Samdrup Jongkhar

**24-1-96**

Phuntsholing

**25-1-96**

Thimphu

*Statistics on page 24*

*The crane caretaker, Ap Phurba Wangdi, had observed that the cranes always bathed in the Kholong Chhu on Mondays and Saturdays. During these days, if the weather was sunny, the cranes would dance and they seldom flew away from their roosting area.*



**Hishey Tshering  
Communications Officer  
RSPN**

21-2979-9

**TOUR REPORT**

**PRE-FEASIBILITY STUDY FOR  
THE DEVELOPMENT OF A PROJECT  
ON NATIONAL WATER QUALITY  
MONITORING IN BHUTAN**

by

Lam Dorji, RSPN, Thimphu

31 August - 16 September 1995

**Introduction**

In August 1995, the Royal Society for the Protection of Nature and the National Environment Commission held a series of meetings on the development of a national project on National Water Quality Monitoring in Bhutan. The RSPN has been given the task of drawing up a proposal for the same. An outline was submitted as the technical details and the field level information was not available. Therefore, the RSPN proposed that it would be wiser to conduct a nationwide tour to gather information and explore technical expertise within the country such as Sherubtse College, Kanglung. The proposal was approved. Due to certain inconveniences, the tour had to be divided into two. Both tours were supposed to be undertaken by Mr. Karma Loday of NEC and self (Lam Dorji, RSPN). The first tour was conducted by myself only as Mr. Karma Loday was unable to attend.

**Aims & Objectives**

This is a report on the first tour which took seventeen days to complete. The purpose of the tour was to:

- ♦ gather information on the existing laboratory facilities in various districts. Given the facilities, whether the concerned laboratories are willing to co-operate or not.
- ♦ Identify technical expertise and contact points/addresses for the required expertise. Hold talks with the Sherubtse College Principal and the Science faculty on their potential and extent to which they can contribute to the project.
- ♦ a rough idea of the location of major sampling stations.

**Tour Schedule**

31 August 1995	Punakha
1 September 1995	Wangdi Phodrang
2 " '95	Tongsa
3 " '95	Bumthang
4 " '95	Bumthang
5 " '95	Mongar
6 " '95	Lhuntse
7 " '95	Mongar
8 " '95	Tashigang
9 " '95	Tashi Yangtse
10 " '95	Tashigang
11 " '95	Kanglung
12 " '95	Kanglung
13 " '95	Pemagatshel
14 " '95	Samdrup Jongkhar
15 " '95	Phuntsholing
16 " '95	Thimphu

**Punakha**

In Punakha, I had a discussion with the DMO at the General Hospital. The discussion was more health oriented. He informed that most patients suffered diarrhoea and dysentery which are water borne diseases. He said that 50% of piped water supply in Talo, Nobgang, and Punakha High School is contaminated. He mentioned that the bacteriological tests indicate more than 100 Ecoli.

Till now, this hospital has been conducting only Faecal and Total coliform (Bacteriological) tests. None of the other chemical tests are conducted. The hospital possesses an old water testing equipment. They are not sure whether it is working or not. He feels that if the hospital is to conduct such tests in the future, provision of equipment and training would be vital for the project as well as the enhancement of the capability of the hospital. He also feels the need for NEC and RSPN to tie up with the Water and Sanitation section of the

PWD. He felt that two to three tests conducted by this hospital for this project would not be of much hindrance.

Elaborating on his view, he stated that unless a solution for the issues indicated by the tests is considered, it would not be advisable just to carry out the tests. On the whole, he expressed appreciation for the idea.

*Suggested sampling points:*

- ◆ Phochhu
- ◆ Mochhu
- ◆ Khuruthang area (after the confluence of the Phochhu and Mochhu)

### Wangdi Phodrang

At the Wangdi Phodrang General Hospital, I met Mr. Tashi Jangchub. The water testing equipment available was HACH DR/2000 for which the battery is down. He said that as far as water testing is concerned he is trained only in the faecal and total coliform tests. Most of the lab technicians through out Bhutan, he felt, are trained similarly. Till now other chemical tests were never conducted. When asked, he was not in a position to suggest sampling points in Wangdi district as he had not much idea about the areas away from the hospital.

*Suggested sampling points:*

- ◆ Dang chhu (Teuke Zam)
- ◆ River from Sha Slate mine.
- ◆ Dang Chu (before joining Thae chhu)
- ◆ Puna Tsang Chu

### Tongsa

On our way to Tongsa, we stopped at Sephu Basic Health Unit to find out its potential towards contributing to this project. Although cases of water borne diseases were reported in the past, no water tests have been conducted due to the lack of trained manpower and equipment. Personally, I very much feel the need for a sampling point on the Nikka Chu.

Mr. Ran Bahadur Giri, lab technician of Tongsa General Hospital informed me that due to the water borne diseases, the hospital has till now been concentrating on bacteriological (Faecal and

Total coliform) tests only. This is because the lab technician lacks training in other chemical tests. The hospital however has the equipment HACH DR/2000 required for a range of chemical tests. He said that collaborative work on this project could be pursued with permission from the Health headquarters.

*Suggested sampling points:*

- ◆ Nikkachhu (Nikkachhu Bridge)
- ◆ Mangdechhu (Mangdechhu Bridge)

### Bumthang

The lab technician of Bumthang General Hospital had similar answers as other lab technicians. The lab possesses HACH DR/2000 for water testing while the staff member supposed to handle this equipment is trained only in biological and not chemical tests.

*Suggested sampling points:*

- ◆ Two sampling points on the Chumeychhu (river flowing through Chumey valley) One in Gyetsa and the other could be just before its confluence with the Chamkharchhu.
- ◆ Three sampling points on the Chamkharchhu (river flowing through Jakar valley). One station could be located a few kilometres upstream from Kurje Lhakhang. the second could be stationed a kilometre or two downstream from the main town area. The third could be after the confluence of Chumey and Chamkhar rivers.

### Lhuntse

Lhuntse is a district with limited electricity supply from 5 PM to 8 AM. The Kurichhu river flows all the way from China and is considered to be polluted. However, the district hospital does not possess any water testing equipment and even if it does, the lack of electricity during working hours renders it useless. As with the other cases, Mr. Karma Thinley, lab technician, is trained only for biological tests. Personally, he feels that the national water quality monitoring project would prove advantageous in the long run. Given the equipment and overtime payment, conducting tests shouldn't be a problem, he feels.

*Suggested sampling points:*

- ◆ on the stream that flows through the Lhuntse town.
- ◆ on the Kurichhu river at Hebethang,
- ◆ on the Khomachhu
- ◆ on the Kurichhu at Sumpa
- ◆ on the Kurichhu at Autsho

**Mongar**

A discussion with the Mr. Solomon Yogi, Lab technician of Mongar General Hospital, the status on water testing capabilities is very much similar to other hospitals. The lab has a water testing kit (HACH DR/2000) and the all the people engaged in the lab are not trained in chemical tests.

*Suggested sampling points:*

- ◆ on the Duksumchhu (flowing through Lingmethang)
- ◆ on the stream that flows from Korila into Kurichhu
- ◆ on the Kurichhu near by Kurichu Zam (the National Highway Bridge)
- ◆ on the Kurichhu after its confluence with Duksumchhu.
- ◆ on Sherichhu.

**Trashigang**

The DMO of Trashigang General Hospital, Dr. Chencho mentioned of his interest in this project. He stressed the need to train the lab assistants. The hospital possesses a HACH DR/2000 water testing kit. However, to date the hospital has carried out biological tests only.

He suggested that sampling should be done twice a year, i.e., in extreme summer and extreme winter. If the training in water testing helps the health sector (being an important part of the environment), the project should incorporate such training for each dzongkhag. He said that this project could play a dual role. It would be good for the project to look into the possibility of bottling mineral water (considering chemical tests) instead of importing water when we have the required resources.

*Suggested sampling points:*

- ◆ at Gomkora on the Dangmechhu.
- ◆ at Rangjung on the Rangjungchhu.
- ◆ at Chazam on the Dangmechhu.
- ◆ on the Dangmechhu (after confluence of Sherichhu and Dangmechhu)

**Tashi Yangtse**

Tahi Yangtse does not have a hospital. Mr. Tshering Dorji, Health Assistant, has been kind enough to provide the required information. It has a Basic Health Unit (BHU) which does not have any equipment and lab facility. The BHU has conducted no water tests till date. When conducted, the samples are taken to Trashigang hospital for faecal and total coliform tests only. If chemical tests are to be conducted, training is the first requirement.

*Suggested sampling points:*

- ◆ TashiYangtsechhu (near the suspension bridge north of the town)
- ◆ at Doksum on the TashiYangtsechhu.
- ◆ on the Rangthangwongchhu (before confluence with the TashiYangtsechhu)

**Sherubtse College**

As mentioned in the proposal, one purpose of the tour was to identify technical expertise and the role of Sherubtse college. The Vice Principal, Mr. Thakur Singh Powdyal was very positive about this project. It is hoped that this project will promote greater collaboration between Sherubtse College, the National Environment Commission and the Royal Society for the Protection of Nature (RSPN). The advantage of the involvement of Sherubtse College in this project is two fold. Firstly, Sherubtse college has the required technical expertise that could contribute to the success of the project. Secondly, the project could enhance the practical knowledge of the students. It would enable students to deal with realistic issues.

I have had several discussions with three staff of the college who have been identified as technical personnel. They have been briefed about the project with which they have been able to get an idea of the sort of input required. The

scientific part of the project could be dealt with by Sherubtse College's science faculty.

#### Chemical tests

Dr. Arora, Chemistry lecturer, has done research on the quality of water both in India and in Bhutan. He therefore has the required experience. His contributions to this project would be necessary. During our discussions, Dr. Arora stressed that for him, it is not the monetary benefit that counts, but the goodwill that he has to live up to. He has agreed to help the project's chemical aspects. In case the project incorporates training for chemical tests, he has agreed to be the trainer provided it is conducted during non academic period.

#### Identification of water animals / insects

Mr. Battarai and Mr. Mense of the Zoology department has agreed to identify the water animals and insects. However, they said that there would be a range of requirements the details of which they promised to send by fax.

#### Identification of Plants

Mr. Sadrudhin of the Botany department has agreed to identify the plants. He has agreed to send by fax, the details of botanical input required for this project.

Although, the above identified personnel have agreed to send the detailed input for the project and resources required for the same by 17 September 1995, they have not done so as yet. As per telephone conversation with the Vice Principal, it should reach us soon.

#### Pema Gatshel

In Pema Gatshel, I met Mr. Sangay Jamtsho, lab technician, and found out that they have a HACH DR/2000 water testing equipment, But they have been conducting only the Faecal and Total coliform counts. He is also untrained in other chemical aspects.

#### Suggested Sampling points:

- ◆ on the Marungchhu upstream of the gypsum mines
- ◆ on the Marungchhu downstream of the gypsum mines

#### Samdrup Jongkhar

The DMO of Samdrup Jongkhar, Dr. Dorji Wangchuk has been very helpful in providing information on the network of rivers under Samdrup Jongkhar district. Because of the terrain, Samdrup Jongkhar is not drained by one major river, but by many other rivers which are no less important. Dr. Dorji Wangchuk therefore feels that BHUs can play a major role as far as this project is concerned.

He stressed that channelling things for approval is important. There is the need to co-ordinate at the Headquarter level. Complete set of equipments should be supplied and training provided. Credibility of the work undertaken should be clear.

#### Suggested sampling points:

- ◆ Stream and lake at Decheling, Nganglam;
- ◆ The Decheling stream and the lake and the stream are the main source of water for the people. The lake is dying and may have problems in the future. The northern part of Manas river should be covered. The Decheling BHU could be involved.
- ◆ Kerong river: Kerong river has a lot of aquatic life. The Dungsam Cement Project may have had adverse effects. The Nganglam BHU could be involved.
- ◆ Choukhi river: Fishing and hunting is very much prevalent in this river. This river is around six hours walk from Kulikata dispensary.
- ◆ Samdrup Jongkhar stream: It is a highly polluted stream and a source of water supply for the Samdrup Jongkhar town. The Samdrup Jongkhar Hospital could be involved.
- ◆ Martang river, Bangtar
- ◆ Orong river: The Orong BHU could be involved.
- ◆ Nyera Amachhu: considered the biggest river in Samdrup Jongkhar. The Gomdar BHU could be involved. The Southern portion could be covered by the Kawapani BHU.
- ◆ Nunai and Borla river: Nunai outreach clinic could be involved.
- ◆ Janpani river: Considered longest and second largest in Samdrup Jongkhar, this river can be monitored by Menjung BHU and Lamri BHU in the north and Diafam BHU in the south.

# SLASH-AND-BURN

This practice is claimed to be the first system of food production. It was either chanced upon by accidental burning of the forest or introduced through experimentation based on the observation that foodgrains grew from edible seeds, provided some manure is supplied. This practice is argued to have evolved from food gathering because of its female-centredness and the type of implement used, which is an extension of the digging stick used by women in gathering. *Hence it is also argued that slash-and-burn was the discovery of women.* Man's contribution to slash-and-burn is largely seasonal (e.g. in burning, protection of crop just before harvest and during plantation, harvesting, etc.), while women keep a regular track of the progress of the crop, weeding, etc.

Studies among tribes practising it today reveal that this method consists of burning small vegetation on a patch of the hill slope, collecting the residue in the middle of the patch and then leaving it to the rains to turn the heap into manure so as to have it and spread

it evenly. Once this was completed, seeds have to be sprayed or planted by hand, using the hoe or digging stick. The mixture of seeds was such that crops were available throughout the long stretch of harvesting period.

Investigations today show that the production system in slash and burn is not uniform but varies from region to region according to suitability. In some regions, it has a short fallow period whereas in others, the fallow period is long. In some regions, such as in the eastern states of India, cropping is done for three years consecutively whereas in others it is done only once a year, and cultivation is taken up again with a gap, depending on the terrain.

A close economic linkage between slash-and-burn cultivation and food gathering has also been made. The extent of dependency on the former varies from very high to marginal. Though it is difficult to provide an overview of items grown in the slash-and-burn fields in India because of the variations of climate, soil and customary practices, it is possible to say that the

majority grow cereals, tubers and rhizomes, fruit and vegetables. In some parts of the north-east paddy is cultivated along with millets, vegetables and fruit. Subsistence production of most of these crops can be seen amongst the slash-and-burn cultivators while commercial crops are grown more on plain lands.

Slash-and-burn is not necessarily a subsistence mode of production. Where the land is fertile and the population pressure low, like the North-East, it is known to generate substantial surplus. Traditionally, the surplus is kept on a community basis and controlled by the village council as a security against unexpected calamities and the lean season. This used to be popular among many tribes in eastern India who keep the surplus in traditional grain banks or in baskets under the charge of the village council to be used during the lean season or community festivals. It is acknowledged amongst tribals that slash-and-burn can cause deforestation. For this reason, sacrifices are made to the forest gods by many tribes, seeking pardon for the destruction.

Protection is largely considered to be a male task in which the women assisted much in the same way as men did in slash-and-burn and gathering activities. Other

than organized activities when there is attack by wild animals or outsiders, or hunting of such animals to prevent attacks, protection work consisted largely of building and repairing of houses and fences. When domestication of animals became prevalent, the animal shelters were attached to the houses so that attack by wild animals or attempts at stealing became immediately known.

The combination of the varieties of coarse food obtained from slash-and-burn cultivation



with the produce gathered from the forests and meat through hunting and fishing provided rich nourishment to the tribals when the surroundings were rich in natural resources. It is significant to note that economic activities of the tribals were organised along with the natural cycle. Slash-and-burn cultivation provided some food grains for most of the year. The peak fruition season for summer fruits extended from February-March to April-May, was interspersed with preparation of land for slash-and-burn and extended till the arrival of

monsoon. Winter fruits were collected in November-December with short periods of harvesting. Fresh or preserved meat provided additional nourishment, though the nutrition

component of such extras would be around 20 to 30 per cent of other food. This is available throughout the year.

The only period of scarcity was during the monsoons when much reliance was placed on surplus foodgrains, roots, shoots, tubers, wild vegetables, preserved animal meat, fruit, dried and powdered seeds such as mango kernels and tamarind seeds. Some tribes like the hill Saoras were one of the most flourishing tribes due to the adoption of the above practice.

## SLASH-AND-BURN

### *Not entirely bad?*

It is generally argued in official circles that slash-and-burn is essentially an irrational and destructive practice, with high input and relatively low production. However, recent studies show that slash-and-burn is based on highly rational calculations and is best suited to the ecological context of the hill dwellers. Besides its suitability to the terrain, there is also the factor of practicality of the cropping pattern it allows. Mixed cropping allows for multilayered canopy, in which the more hardy varieties having longer stalks protect the more vulnerable

crops from sun, wind, as well as prevent soil erosion.

The mixed crop grown in the *tseri* fields is so evolved that the root system of different plants reach out to varying degrees of depth. In this way, different crops are able to use nutrients from different layers of the soil. In contrast, all plants under the monoculture system draw upon the same stratum. Diversification of cropping is also done both to meet consumption needs and as an insurance against vagaries of weather so that if one crop fails, others will come up. Owing to these reasons, slash-and-burn is less affected by drought conditions than settled agriculture. Crops under slash-and-burn can rely upon existing soil moisture to some extent.



# THE WHALES - A VANISHING BREED

Since the whaling business developed over 100 years ago the numbers of whales left alive has fallen dramatically, and now most of the larger whales have been hunted to the very edge of extinction.

Whales are hunted because they provide a variety of useful products: oil for softening leather, making soaps, crayons and lipsticks; meat for pet foods and bones and blood for making fertilizers and glue. *And yet alternative substances now exist for all current uses of whale products.*

The only hope for whales is to control whaling more strictly before they are killed off completely. The International Whaling Commission, under great pressure from conservation groups has tried to limit the number of whales being killed.

Many of the larger whales have some formal protection, but much of this depends on the goodwill of whaling nations to ensure that laws are followed. The main reason for the continued killing is that nobody owns or is responsible for the open sea. People can take its resources without worrying about the consequences.

## The Great whales and the effect of commercial whaling on their population status

### 1 Sperm Whale (*Pyseter macrocephalus*)

Type: Toothed (the largest of the toothed whales)

Distribution: Worldwide

Features: Its name comes from Spermaceti, an oily wax found in an extraordinary storage tank located in its head. It is thought that this wax helps the whale dive deep and surface quickly without being affected by changes in water pressure.



### 2 Grey Whale (*Eschrichtius robustus*)

Type: Baleen

Distribution: North Pacific Ocean

Features: This whale travels up to 18,000 miles a year on its journey between feeding and breeding grounds. This is the longest migration of any known animal.



### 3 Minke Whale (*Balaenoptera acutorostratus*)

Type: Baleen

Distribution: Worldwide

Features: As the number of great whales have gone down, their food of krill has increased rapidly. The minke whale, one of the smaller whales has taken advantage of this extra food, and as a result the number of minke has grown. But these whales have not escaped the whaler's harpoon.



4 Brydes Whale (*Balaenoptera edens*)

Type: Baleen

Distribution: Worldwide

Features: This fast swimmer looks like the sei whale.



5 Sei Whale (*Balaenoptera borealis*)

Type: Baleen

Distribution: Worldwide

Features: The sei whale, another fast swimmer, has been hunted a lot in the Antarctic and North Pacific oceans since the early 1960's when the fin whale stocks began to collapse.



6 Fin Whale (*Balaenoptera physalis*)

Type: Baleen

Distribution: Worldwide

Features: The fin whale is partial to eating fish like herring. The whale makes a low frequency sound and uses the echo to home in on groups of fish. It rounds the fish up into a tight bunch and then sucks them into its mouth.



7 Blue Whale (*Balaenoptera musculus*)

Type: Baleen

Distribution: Worldwide

Features: Despite its great size, this whale can move at a speed of 27 km per hour for 2 hours. It often travels in groups of 2 or 3 animals.



8 Humpback Whale (*Megaptera novaeangliae*)

Type: Baleen

Distribution: Worldwide

Features: A relatively slow swimmer, this whale has a complex song made up of astonishing range of notes and sounds which last as long as 15 minutes, and can be repeated time after time. The songs vary according to the seasons and where the whales come from.



9 Black Right Whale (*Eubalaena glacialis*)

Type: Baleen

Distribution: Worldwide

Features: So-called because, swimming slowly and sluggishly, it was the right one (easiest) to kill of all the whales. It also floated when dead, unlike other whales, which sank when killed and were lost. This was the first whale brought near to extinction through hunting.



10 Bowhead Whale (*Balaena mysticetus*)



Type: Baleen  
 Distribution: Arctic Ocean

Features: The bowhead whale is very like the right whale. This was one of the first whales to be killed until its numbers were so low it was no longer economic to hunt. It continues to be hunted by Eskimos on a small scale.

She, compelled by the rocks to stay behind,  
 Is by the vastness of her bulk confined.  
 They shout for joy! and now on her alone  
 Their fury falls and all their darts are thrown.  
 Their lances spent, one bolder than the rest,  
 With his broad sword provoked the sluggish beast;  
 Her oily side devours both blade and shaft ...  
 And now they change the colour of the lake;  
 Blood flows from her wounded side,  
 As if she would prevent a tardy tide,  
 And raise the flood to that propitious height,  
 As might convey her from this fatal strait.  
 She swims in blood, and blood does spouting throw  
 To heaven, that heaven men's cruelty know ...

**Edmund Waller:** From *The Battle of the Summer Islands*. Canto III

TABLE SHOWING SOME REASONS LEADING TO THE WHALE'S EXTINCTION

Part of Whale Used	Product
Sperm oil	Industrial oil, lubricants, leather dressing, textile trade, cosmetics, candles, crayons, polishes
Whale oil	Margarine, soap, printing ink (from meat, blubber, bones)
Whale meat	Animal feeds, pet food, human consumption
Whale bones	Fertilizers
Whale skin, bone, tendons	Gelatine for photographic film, confectionery, edible jellies
Whale blood	Plywood glue
Whale liver	Vitamin A
Endocrine glands	Hormones
Ambergris	Perfume

## PROPOSAL TO ESTABLISH Interpretation Centre At NIE, Samtse

### Rationale

**The National Institute of Education (NIE), Samtse** offers three courses. They are as follows:

#### 1. PTCE Course

*(Primary Teacher Training Certificate Examination)* for the Primary Teachers for two years.

#### 2. B.Ed. Course

*(Bachelors in Education)* for both primary and secondary teachers for three years.

#### 3. PGCE

*(Post Graduate Certificate in Education)* for high school teachers.

Therefore establishing the interpretation centre in the institute will provide the best avenue for the student teachers to expose themselves to the idea of an interpretation centre. This will enable them to similarly set up such centres in the schools where ever possible once they are posted after graduation.

There are 83 children of the staff members in the campus. Their ages range from one to fourteen years. Most of them attend

school, so these children will also be aware of what exists in the environment and develop a positive attitude towards it.

More so, the Samtse Junior High School (with at least 600 students) very close to the institute will also be able to benefit from the centre.

### Objectives:

- ♦ The student teachers of all the courses will be able to get an idea of planning, construction and looking after the interpretation centre.
- ♦ Classes on awareness raising with the student teachers, children in the campus and the students from Samtse Junior High School could be arranged.
- ♦ Student teachers will be able to take up projects.

### What to construct?

1. A pond with aquatic life for the student teachers and the children to conduct observations.
2. A semi-circle outdoor classroom with a permanent concrete structure.

3. Create an avenue to culture different species of orchids.

4. Plant different types of bamboo trees.

5. Swings for children: the fund for this will be made available by the institute.

6. See-Saw for children: funding will be arranged by the institution.

7. Sand pit for children.

8. And other set-ups as per the plan.

### Where to construct?

The construction site for the proposed centre is already planned and approved in the space above NIE Auditorium. In fact, the site development has been done already

### Source of fund

The Royal Society for the Protection of Nature will be requested to arrange at least Nu. 12.000/= to supplement the actual cost of construction. The funds will be mainly used for procuring materials and in

making the labour payment.

**Expenses**

The following estimates indicate where the fund will be utilized.

A. Construction of **pond** would involve the execution of the works mentioned below at a cost of Nu 8.000/-

- a. Connection of **water pipe** from 200 meters.
  - b. Purchase of 200 meters of **GI pipes** and other accessories.
  - c. Digging of **pond** with 40 meters in diameters and 2 meters deep.
  - d. Procurement of **plastic** to lay in floor of the pond 41m X 41m
  - e. Labour **wages**
- B. Construction of concrete semi-circle **outdoor classroom** at a cost of Nu 10.000/-

- a. Purchase of cement
- b. Purchase of bricks
- c. Pebbles
- d. Site development
- e. Labour charge

3. Creation of **avenue** to culture different species of orchids at a cost of Nu. 1.500/-

- a. Tools
- b. Labour payment

D. **Site development** to create space for the plantation of different types of plants at a cost of Nu.1.500/-

- a. Site development and labour payment

**Total Nu. 21,000/-**

E. Foothpath, gravel

**Note:** The funds for the construction of area no. 5, 6, 7, 8, and any other set-ups as per the plan will be made available by the Institute.

**The Work Force**

The Children's Park Committee consisting of the following personnel will carry out the execution of the work:

1. Mr Jagar Dorji (Chairman)
2. Mr Wangchuk Rabten (Member)
3. Mr Yeshey Dorji (Member)
4. Mr V.S. Garg (Member)
5. Mr A.K. Dhara (Member)
6. Mr Kezang Wangchuk (Member)
7. Mr Karchung (Coordinator)

Mr Mincha Wangdi, Environmental Education Officer, RSPN Thimphu will be invited to share his consultancy services.

Proposal prepared in consultation with the Children's Park Committee members by

**Karchung**  
(Co-ordinator)  
Children's Park Development

The love of dirt is among the earliest of pursuits, as it is the latest. Mud-pies gratify one of our first and best instincts. So long as we are dirty we are pure. Fondness for the ground comes back to a man after he has run the round of pleasure and business, eaten dirt, and sown wild oats, drifted about the world and taken the wind of all its moods. The love of digging in the ground (or of looking on while he pays another to dig) is as sure to come back to him as he is sure, at last, to go under the ground and stay there. To own a bit of ground, to scratch it with a hoe, to plant seeds, and watch their renewal of life - this is the commonest delight of the race, the most satisfactory thing a man can do.  
**CHARLES DUDLEY WARR**



**SAVE THE FOREST  
AND  
MAKE BIKHAR THE BEST**

**PREM SHARMA**  
TEACHER - BIKHAR PS - TRASHIGANG

Our school has started a throughout the year project on the theme "Save the forests and make Bikhhar the best".

Environmental awareness among the villagers of Bikhhar is very poor at present. This place, being three hours away from Trashigang town, is not accessible by road but has electric supply. People are totally illiterate. As a result, our school had decided to set up a project along with our senior students to arouse environmental awareness among our students and the public of Bikhhar. I would like to lay out the complete report of the project done until now and also the future plans.

We inaugurated the project by showing our senior students and their parents the environmental films that were issued by the RSPN. The students with our guidance prepared large posters and charts carrying various messages for the protection of forests and the environment.

On 2 June, to celebrate the Coronation Day of His Majesty the King and Social Forestry Day, our senior students hoisted a banner reading "MAKE BIKHAR THE BEST" and marched around the ground right after the assembly. This was how the day began. Following the headmaster's homily, there were a number of speeches delivered by the senior students on the theme "Social Forestry in Bhutan".

Sweets were then distributed among the students and the assembly concluded with cheers and the raising of the slogan "Plant more trees and grow more forests".

Soon after that, around fifty saplings were distributed per House and planted around the campus. Many photographs were taken of the year's work record. After lunch, students were explained in detail the importance of Social Forestry Day. Posters and charts with different messages were also interpreted.

June 3 and 4 were also busy days for our senior students in preparation for the celebration of World Environment Day on June 5. This year's slogan for the occasion, as we were informed through the media of BBS and Kuensel, "WE THE PEOPLES UNITED FOR THE GLOBAL ENVIRONMENT" was written on a big chart by our students and posted on the school notice board and in the dining room. In the morning, a half hour cleaning campaign was organised to start the day's proceedings. They cleaned the latrines, swept the classrooms, picked up litter and dumped it into the trash bins, emptied the bins into the pit and burned the rubbish. A second pit was dug as the old one had been filled up. After that students gathered for the assembly. The headmaster, in his address, said that among many demons there are three main fiends that destroy our forests and our wonderful environment. He said the demons were animals, fire and ourselves. The students were to urge their parents to control themselves first, grazing of animals in the forest second and the havoc that can be caused by fire, third.

Though Bikhar is a small village, with very little cultivated land, the density of population is around 15-17 per sq. km. This village is populated by more than 400 households. One household can manage with 100 (rongs) loads. We can get around 10 (rongs) loads of firewood from one tree and therefore around 4000 trees are being cut down every year in Bikhar itself. To replace them, not even a single tree is planted by the farmers.

After the assembly, we divided our students into three large groups: one for the school, a second for the BHU and the third for the nearby village. The group for the school did a lot of cleaning work and fenced the tree saplings that were planted on June 2. The second group also did the same around the BHU. The third and seniormost group was sent to the nearby village houses for a clean-up demonstration.

All three groups were led by teachers and carried different posters explaining the importance of a good environment. This activity oriented programme makes our project more effective.

*Our project involves a number of other things to do in future.*

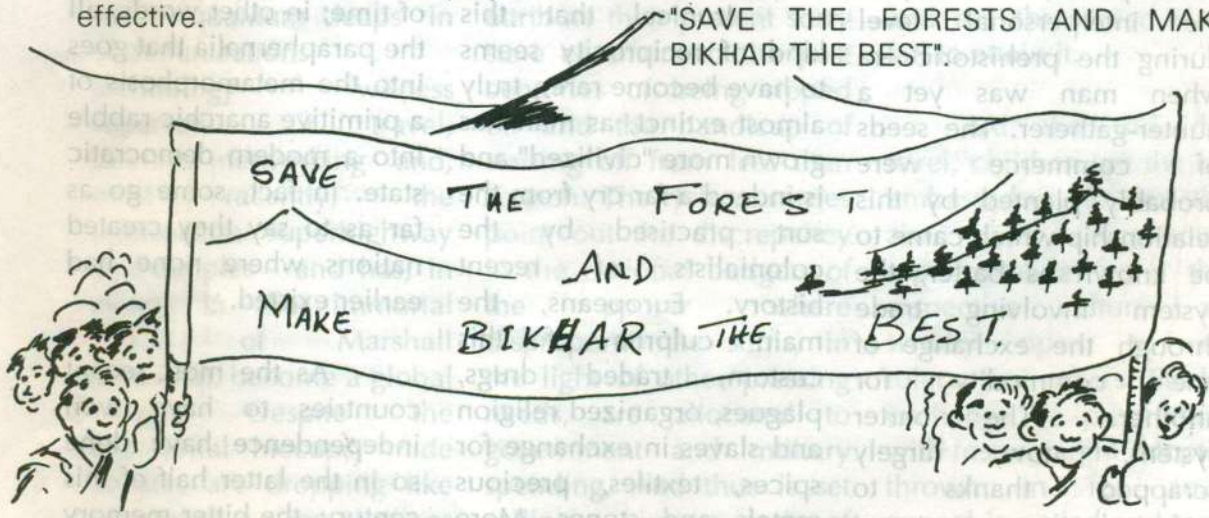
**June-July:** Planting saplings in the places where the land has been left barren.

**August:** A parent-teacher meeting to discuss and arouse environmental awareness among the parents. This coincides with the BHU's programme and training for intensive sanitation promotion.

**September-October:** On the basis of the environment, a talk on healthy habits. Also there will be a debate "Forests are better than towns".

**November-December:** Speech competition by our senior students on the topic, "Fuelwood - how we can minimize cutting trees."

Our final report of the project will be given during the third week of November. Our students in Bikhar, who know nothing about the importance of social forestry, environment and the resources of different life giving elements before have started to murmur "SAVE THE FORESTS AND MAKE BIKHAR THE BEST".



John Michael Chiramal

## How And In What Manner Reciprocity Should Be Practised

According to Webster's dictionary, reciprocity is *the quality or state of being reciprocal: mutual dependence, action or influence.* It is further defined as *a mutual exchange of privileges; specifically, a recognition by one or two countries or institutions of the validity of licenses or privileges granted by the other.*

To boil all that dictionarese gobbledygook down to more lucid layman lingo: the words of the streetwise saying, "You scratch my back and I'll scratch yours." puts it pithily enough. It's a sentiment that predates the institutionalization of society itself, not to speak of nation-states, and possibly existed initially at the interpersonal level during the prehistoric era when man was yet a hunter-gatherer. The seeds of commerce were probably planted by this relationship which came to be known as barter, the system involving trade through the exchange of one commodity for another. The barter system, now largely scrapped thanks to monetarization except maybe with children swapping comics, stamps and what have you, remains extant in its

pristine form among, if I'm not mistaken, certain pygmy tribes of the Congo. These anachronistically honest little people have a trading practice that, in this hard-nosed day and age, stands as an instance of free enterprise at its most heartwarming.

What they do is this: at some prearranged site, these guileless folk deposit their merchandise then vacate the premises. Parties interested in transacting a deal are at liberty to appraise the wares and either, if so disposed, leave an equivalent substitute (the quantities being left entirely to their discretion) or turn up their noses (figuratively) and give it a miss.

Ironical that this kind of reciprocity seems to have become rarer, truly almost extinct, as man has grown more "civilized" and is indeed a far cry from the sort practised by the colonialists of recent history. Europeans, the main culprits of this custom, traded drugs, plagues, organized religion and slaves in exchange for spices, textiles, precious metals and stones. More like the reciprocity one remembers from elementary mathematics

where half is the reciprocal of two!

In the eyes of the colonised - the losers' point of view, if you will - not only had their national wealth been plundered, but, to compound the indignity, they'd paid for the exploitation through enslavement. The victors, who write the histories, will claim, on the other hand, reverting to the White Man's Burden brocard, to have bequeathed to the not so noble savages basic developmental and industrial infrastructures, communications networks and the bedrock of a political and legal system distilled from the essence of Western Philosophy, one that has stood the test of time; in other words, all the paraphernalia that goes into the metamorphosis of a primitive anarchic rabble into a modern democratic state. In fact, some go as far as to say they created nations where none had earlier existed.

As the most recent countries to have won independence have done so in the latter half of this century, the bitter memory of bondage still rankles and rears its bellicose head at any number of confrontations, both verbal



and belligerent, between these old antagonists who now go under the new names of First and Third Worlds or, when relations are somewhat thawed, donor and recipient nations. One would have imagined that, with the supremacist policies of exploitation and peonage presumably things of the past, such divisions would cease of their own accord. However, a neo-colonialism of sorts has replaced the devil of old and its name is Multinationals. The stranglehold these corporate bodies have on the so-called free market is as grim and unrelenting as any of the earlier unjust systems that had held the less 'developed' in thralldom.

The world has, in the last three decades, made quantum leaps in communications technology - witness supersonic air travel, satellite networking and, most recently, the information superhighway as examples - and has, in effect, in the immortal words of Marshall McLuhan, become a global village. Despite the occasional hiccups, trade barriers are dropping like apparel at a peep show as evidenced by the latest GATT agreement. In this climate of the New World Order, reciprocity between

nations is ready to take on an even keel provided sacrifices are made and a feeling of mutual empathy supersedes the island-fortress mentality.

The present donor-recipient relationship is due indeed an overdue shakedown. The recipient, besides being weighed down by a pervading sense of indebtedness, feels helpless like a puppet in the hands of its donor/s. The strings tied to aid tend to hamstring the receiver and demean national pride. The donors, on the other hand of the handout, understandably feel they must have a say in the why's and wherefore's of the spending and attach a litany of conditions to the same.

The poor countries attribute their present sorry state of affairs to the past centuries of being ripped off and the handicap of starting off from less than scratch. The rich countries point out the discrepancy in the national budgets of the poorer where disproportionate sums, in the light of other pressing needs, are allocated to government and military spending. And thus is set rolling a vicious cycle of cant and suspicion as crippling as the wheel of life and crying as aloud for release.

In order to transcend reciprocity beyond mere commercialism, one must acknowledge the entire gamut of 'exchangeables' from culture to currency. What may two nations trade? The assets of a state may be both tangible and intangible. Its corporeal wealth being the obvious: oil, crops, timber, etc.; and the intellectual, resources such as technology, entertainment, literature, philosophy and the like. To establish a *quid pro quo* between the two categories requires a sense of appreciation of and compromise *vis a vis* comparative values.

Reciprocity applies at the international as well as the national and the individual levels. All nations stand to gain from world-wide reciprocity - and are threatened if we fail to attain it.

At the individual level, children are the best ambassadors, in that they are ingeniously representative of their respective cultures and wholly open to and tolerant of others. Student exchange programmes with foster parent adoption thrown in for added appeal is a tried and tested way of bridging the gap at this young and impressionable age. Camps like the Children's

Village venture are another endeavour in the same vein bound to have lasting and cohesive effect. At a more mature level, reciprocity is realizable through tourism, research facilities and human resource development opportunities.

Correspondence, particularly by way of pen-friendship, has and will continue to span the communication barrier between nations and with the evolution of telecommunications culminating in the internet, such paths of contact have been enhanced to help people reach out across frontiers. At the institutional level, the phenomenon of 'twinning' as practised in a number of countries between towns and villages may be extended to include schools, colleges and NGOs. The close relationship, twinning entails, is an ideal vein for the exchange of ideas, resources and people. The fields of mass communication, educational/cultural exchanges and indigenous arts and crafts and medicine in particular offer prospects for this mode of traffic.

At the international level, a long hard look is to be taken at what each country has to offer the

other. The imbroglio over existing trade imbalances (ostensibly holding up the GATT agreement) is a case in point. The ideal free market-open frontier policy seems to have the dice loaded in favour of the industrialized world. Their state of the art technological skills, slick marketing techniques and sophisticated delivery systems combine to give them an unfair advantage. Operating under this handicap, the poorer nations find themselves unable to compete on their own home grounds let alone in the international arena.

Reciprocity in this context implies allowing the Third World access to superior technological know-how, providing their people employment and training opportunities and generally promoting the economic development of the country. In return, the richer companies/countries receive a slice of the profit pie, tap a cheap source of manpower and resources and generally derive foreign policy mileage via the feel-good factor. Worth emulating in this context but without its political slant is the US foreign policy scheme of granting Most Favoured Nation status, wherein preferential treatment in trade & etc. is meted out to states with struggling economies.

Instead, what one sees is the poor countries selling their natural resources at throw away prices and buying back the finished products at highly inflated ones, thereby ending up veritably two time losers. The pharmaceutical multinationals are especially culpable in this malpractice. In the absence of any safeguards against this misuse, the gap between rich and poor grows more chasm-like.

As of now, donor countries do the giving and the recipients, the taking. To raise this relation beyond mere charity, in view of the stigma attached to the term, nations should recognize that wealth is not just material and that an apparently poor country may have something valuable to offer even if it be simply spiritual solace. A country may be 'poor' in terms of its GNP but if its environment is pristine with fresh air, clean water and fecund biodiversity, does it not possess true wealth? It is heartening therefore to note the welcome indications of this awareness in the recent initiatives taken by multinationals in promoting the preservation of large tracts of rain-forests earlier under

direct threat from these self same corporations.

No nation today is self sufficient. If we are to achieve global reciprocity, a firm alliance must be established between all countries. The levels of development in the world are unequal, and the lower income countries must be helped to develop sustainably and protect their environments.

Environmental concerns tender a tailor-made avenue for this manner of enlightened reciprocity. It is now a given that the affluent nations are the prime movers and shakers who have, with an unholy zeal and in pursuance of the equally unholy grail of material comfort, contributed disproportionately (in the light of their comparatively lesser populations) to global warming, ozone layer depletion, and bio-degradation. The developing countries threaten to follow in the former's not so illustrious footsteps and deliver the *coup de grace* to an embattled environment. Now this is where true reciprocity steps in and not a moment too soon. The threat to the environment is a universal one and is no respecter of colour, creed or GNP. Instead of the have's dictating to the

have-not's what to do, and what not to do, the entire rigmarole must be viewed as a shared concern involving a common solution requiring forbearance on the path of the former and restraint of the latter. With the survival of the planet at stake, petty and parochial motives must be subordinated to the general good.

The Agenda 21 from the Rio Earth Summit declaration offers a workable framework for this manner of reciprocity. It calls upon the developed countries, the major players in the pollution arena, to assist their less advanced brethren to minimise environmental degradation by providing them with the wherewithal to explore more eco-friendly alternate and renewable resources.

For reciprocity to be truly realizable and not merely an utopian pipe-dream, it is very necessary for the peoples and governments of the world to have an encompassing view of the reality. The world and its resources are to be shared equitably. The existing inequity cannot sustain itself. The condition of have's and have-not's is an anachronism at this point in time when we stand on the threshold of the new

millennium. A spirit of compromise and a global vision is what it takes to reverse the debilitating trend. Fascism and all such related forms of fundamentalism must be collectively shown the door. The rich nations must learn to do with less and desist from their practices of conspicuous consumption. The poor countries need to prioritise their requirements and do more about feeding, clothing and housing their below the poverty line millions and spend less on luxury items, the military-industrial complex and the governmental bureaucratic behemoth.

Reciprocity is echoed both as a fundament of science (*Every action has an equal and opposite reaction*) and religion (*Do unto others as you would have them do unto you*). It is myopic and selfish and shameful that in this era of space exploration, laser optics, microchips and genetic engineering, where man is extending the frontiers of his knowledge and its application, that something so basic as our common survival is left on the backburner if not altogether out in the cold.

**Reciprocity is now not simply desirable; it is indispensable.**

**NEPAL**

**In Mustang, a flowering dream to transform the desert**

*Birendra Thakali can't believe it. For years he thought it was impossible to sustain families in Mustang by farming. But the efforts of a Japanese volunteer may be changing it all.*

"Everyone used to leave villages in search of business opportunities," Thakali says. "But increasing number of villagers are now taking to farming."

The change is due to a local organisation in Mustang which is cultivating a suitable cold climate Japanese variety of rice from 1995. Mustang Development Service Association (MDSA) is also teaching local farmers the technique of cultivating the *somewake* variety, already experimented in the frontier district successfully.

"The variety has been a success in some parts of Japan which have similar climatic conditions," says Toru Kondo, who heads the organization. Kondo, 74, has been involved in the project for the last four years with "a dream to transform the desert of Mustang into a colourful garden".

In Mustang where the people grow only uwa, barley and millet, rice is a very valuable commodity. They have to import rice from other districts.

Kondo and his organization are also conducting a number of other activities that range from a flower demonstration farm, apple and forest plant growing nursery to construction of school buildings.

Every year four villagers also visit Japan and return with newer farming techniques to run their farms. They receive training in areas like Nigata, Nichu and Yokohama.

*It was almost by accident that the Kondo mission began.*

In 1977, Kondo while travelling in Mustang as a JICA consultant, witnessed extreme poverty

**E  
C  
O  
-  
S  
A  
R  
C**

and hardship. It didn't take him long to decide that he would devote himself to the rural community once he retired.

It wasn't easy for Kondo to get his project off the ground. He brought out a book *Mustang Asake* (Morning in Mustang) and set up a fund with the money collected from the sale. MDSA now has 800 supporters in Japan who are funding his mission which covers five VDCs in Mustang-Marpha, Thini, Muktinath, Jong and Kogbeni.

Mustang already has some proud achievements. Flowers like tulip and cosmos are growing in the area which is also a major trekking destination.

Kondo, who is currently in lower Mustang, plans to extend his dream of green revolution to Upper Mustang, Manang and Dolpa. But there's a hitch. Every non-Nepali visiting upper Mustang has to pay a weekly fee of 700 dollars. "I'm not a businessman but a mere volunteer," says Kondo. "How can I pay the money?"

The Mustang king Jigme Parwal recently paid a visit to the septuagenarian and sought assistance to set up a school building in Lomathanka in Upper Mustang. "But I can't afford the expensive trekking permit," sighs Kondo with disappointment. Kondo's love for the land beyond the Himalaya is amazing. Mustang can turn into the world's most prosperous garden because its soil pulsates with life.

**BANGLADESH**

**Street children can play vital role in cleaning city**

*Garbage picking "Tokais" can play a vital role in improving the environment of Dhaka city, reports media syndicate.*

The term "tokais" generally refers to children between 5 to 15 years, collecting about 15 kg of non-degradable recyclable items every day. In an average they earn about Taka 25 daily. They are malnourished and suffer from viral and bacterial disease. They need immediate rehabilitation.

The recently published report of an NGO "Concern for Environmental Development & Research (CEDAR)" further says, Dhaka City Corporation is the relevant authority for garbage management. There are dustbins and garbage spots at roadsides of every residential area. The garbage management is probably worst in Dhaka city, the report says, adding there are no set time tables for collection of garbage from garbage spots. Garbage is always seen littered on the roadside and emits bad odours creating an unhygienic atmosphere.

About 55% of the Tokais are aged between 11 and 15 years, followed by 40% of the age range 6 to 10 years. About 30% Tokais are involved less than a year in picking garbage, 10% between 1 to 2 years, 20% between 2 to 25 years, i.e. about 60% Tokais are involved in garbage collection for about two and a half years, says the report.

Reports also say Tokais collect a variety of saleable garbage everyday. The major items are papers, polythene and glass. A Tokai can collect 6.0 kg of paper, 3.0 kg of polythene and 2.0 kg of glass.

About 75% Tokais do not prefer their present job. However, they are collecting garbage day after day only because they have no other way to survive.

Tokais, during their garbage collection, generally suffer from fever which is about 50%. The next major disease is diarrhoea, 30% injury infection on legs, about 15% jaundice and skin disease is also prominent.

It is observed that the high rate of fever is due to viral attack as they work in an unhygienic atmosphere. Though

Tokais are very poor, they do not go to the government hospitals or avoid them because of complexity in getting treatment there. Rather they prefer to take treatment of their own.

### SRI LANKA

**Our island is getting narrower through sea erosion**  
- Nagitha Thera

*Rev. Gandara Bagitha Thera, one time Principal, Sri Pushparama Pirivena, Meetiyaogoda, and one time adviser of Buddhist teachers in government schools in Jaffna, Vavuniya and Mannar districts, issuing a leaflet on "Sea erosion in Sri Lanka" states:*

When Ptolemy, the Greek astronomer and geographer in the 2nd Century drew a map of Sri Lanka, he drew our country in the shape of an unfried pappadam in the book "Periplus of the Euythreon Sea" written in 1st Century AD as a guide for traders who travelled from the Persian Gulf to the Western coast of India. It is stated that Sri Lanka extended to the eastern coast of India. Fahian saw this country as a pappadam when he visited Sri Lanka.

But now the shape of Sri Lanka has changed into that of a mango or a calabash. The reason for this change is the washing away of our coast by the sea.

To solve the housing problem of fast increasing population, the most important thing is to prevent sea erosion. No other than the government can save our land from the sea. Will the people survive if the land on which they live is eaten by the sea? Certainly not! Saving the land is protecting the people.

Geologists, geographers and historians believed that 10,000 years ago, Sri Lanka was joined to India.

# E C O - S A R C

Later Sri Lanka was separated from India by the Palk Strait and the Gulf of Mannar.

Harm from sea erosion may be ascertained from the fact that the distance between India and Sri Lanka is only 22 miles and that the distance in the breadth of Sri Lanka has been shortened.

We may assume that for Sri Lanka to exist as a separated sovereign state, its geographical position must be seen as an important factor.

Fahian visited Sri Lanka in 412 AD during the reign of Mahanama. In his report, Fahian has mentioned the length and breadth of Sri Lanka. according to him, the length of Sri Lanka from North to South was 30 yoduns and the breadth from east to west was 50 yoduns.

According to Codrington and other historians, 1 yodun is equal to 9 miles. Therefore the length of Sri Lanka from north to south was  $30 \times 9 = 270$  miles and the breadth from east to west was  $50 \times 9 = 450$  miles.

A study of these facts reveals that while the length of our country has remained unchanged, there has been a loss of 310 miles in the breadth. The disappearance of land has been caused by sea erosion.

Since Fahien's visit to Sri Lanka 1558 years have elapsed (this article was written in 1970). If we accept Fahien's views, we can predict, unless reasonable action is taken now, in 2000 AD or 30 years from now, six more miles of our land will be eaten by the sea. Will it stop there? Of course not.

By our calculations, we can predict that in 2670 AD or 500 years from hence our entire country will have swallowed by the sea.

To save the country and race from this national calamity, I request that the government without further delay take steps with this future in view. The Great Wall of China, one of the wonders of the world, was built to protect the country. In Europe, countries like the Netherlands and Belgium much below the sea level dikes were built to protect the country from the sea. Let us do our best to

**E  
C  
O  
-  
S  
A  
R  
C**

prevent our land from being swallowed up by the sea.

Please avoid removing and/or digging coral, rubble, stones and sand.

**PAKISTAN**

**Ecology vs economy  
in Pakistan's hills**

*Noxious black fumes spew out from exhaust pipes of a steady stream of vehicles winding their way northward to Pakistan's resort of Murree at 2247 metres and the Galis group of resorts slightly higher than that.*

Every summer the line of vehicles is longer and the fragrance of pines in the crisp, clear Himalayan air are a little more obscured by the smell of diesel and petrol fumes. The narrow winding road that snakes up to the heights is constantly being widened.

Murree is just an hour's drive from the country's capital, Islamabad. Another hour's drive brings visitors out of Punjab province into the Hazara district of the rugged north-west Frontier, to the steeper mountains and most spectacular scenery of the Galis resorts.

The quaint colonial flavour of these scenic mountain resorts established and patronised by the British Raj is fast disappearing. The British found the cool mountains specially welcome during the stifling summer of plains. Present day tourists feel much the same.

Except that today's plain's people trying to "get away from it all" often bring it all with them: crowds, loud music, consumer items, garbage, vehicular emissions.

But locals aren't complaining. "Business has never been so good," says a shopkeeper on Nathiagali's main Murree road. A four drive from

Islamabad, Nathiagali is the largest, most popular of the Gali's resorts.

The summer population of this summer resort is estimated to swell to about 10,000 compared to its regular population of a few hundred.

Multinational corporations, government departments and private citizens maintain well appointed little villas in picturesque Nathiagali. And there are some 50 hotels catering to the needs of those who don't have such facilities.

Most shopkeepers dismiss the ensuing noise and pollution with a philosophic shrug. "What's a little noise?" asks one. "There's bound to be pollution when there are cars. If there was no traffic, there would no cars, and after all, this traffic is Nathiagali's lifeline to economic development."

"We are nothing without our summer visitors," says an old man, recently retired after working for decades as a domestic help at the summer retreats of political dignitaries.

Little boys and teenagers come up from their hidden villages in the mountainside to persuade tourists to buy packets of wild berries or garlands of daisies that they carry around their heads.

Tiny kiosks selling roasted corn have sprung up on bends along the roads leading to the Galis. A stick of corn, though grown locally, is much more expensive than it is in the plains.

Increasingly these kiosks also stock other items: hot tea, packets of crisps, sweets, bottled mineral water and biscuits. "There is nothing here if the tourists don't come. We live for the summers," says the old man. "Everything we have is due to them." This unfortunately also includes the rubbish that now litters the mountainsides. The slopes beneath the wayside kiosks are full of corn husks, paper and plastic packets, candy wrappers, empty tins and used tissue paper.

Up in the Galis, the situation is worse. Many hotels dump garbage into the mountain side, despite the metal

E  
C  
O  
-  
S  
A  
A  
R  
C

garbage containers provided by the Hazara Hill Track Improvement Trust (HHTIT). They are not the only offenders. Ejaz, the bearded watchman cum cook cum office manager of the HHTIT office in the Nathiagali squarely blames the summer visitors.

"They throw away everything in the mountainside," he says angrily. "The area is so clean when they are not around. As for the hotels, we can shut them down if they violate the law which prohibits littering. But they say they don't, and it is difficult to prove." On Nathiagali's Murree road, local shopkeepers dump rubbish into the deep open drains meant for channelling rain water, that runs along the roadsides in front of their shops.

One of the few who keeps the drain in front of his shop clean is a general store owner, Khalid Khan, a political worker and a member of an NGO, the Environmental Protection Council.

"I sprinkle lime in the drain everyday. We tried explaining to the others but they do not listen," he complains.

His is among the small number of voices crying out against the environmental degradation of the area. Summer visitors, they say, may bring economic prosperity - but in their wake come water shortages, sewage problems and garbage that will never go away.

Right now, most locals are willing to ignore or contribute to the garbage in return for the ensuing prosperity, but once the accumulated filth and increasing population begins driving the tourists away, they just might begin to realise the importance of preserving the pristine environment and also force the tourists to observe basic environmental norms, the budding greens say.

# EFFECTS ON FORESTS

compiled by  
**Tashi Wangchuk IX D Drukgyel HS**

**Forests and related land cover types** are important terrestrial eco-systems. This accounts for over  $5.2 \times 10^6$  square kilometres of the earth's land surface. On a regional and global scale, forests play a part in modulating climates and are the lungs of the planet.

Deforestation is believed to contribute as much as 25% of the increased carbon dioxide which is the principal cause of enhanced greenhouse effect. Estimates made in the early 1980's for tropical forests suggest that about 0.6% of tropical forests are lost annually. This is equivalent to  $11.3 \times 10^6$  ha worldwide or an area about half the size of the UK. Brazil alone has deforestation levels of 50,000 km sq. per year in the Amazon.

The table below indicates the countries with the highest losses of closed tropical forests:

Country	Area of closed tropical forest lost each year (ha)	Area lost annually as proportion of tropical forest land (%)
Brazil	1,480	19.8
Colombia	820	10.9
Indonesia	600	8
Mexico	595	7.9
Ecuador	340	4.5
Nigeria	300	4
Ivory Coast	390	3.9
Peru	270	3.6
Malaysia	255	3.4
Thailand	252	3.4

Contd. from page 2

## Black-Necked Crane

## Annual Winter Count 1996

Sl. No.	Place	Total Number	No. of Juveniles	Remarks
1	Phobjikha	214	14	As reported by Beat Officer and Crane Caretaker
2	Khotokha	18	-	No. of juveniles not reported by the above
3	Bumthang Gyetsa	9	4	4 cranes including 2 juveniles spotted by team, rest according to locals
	Thangbi	10	4	
4	Bomdeling	144	21	A drop from 173 in 1995