THE RSPN PUBLICATION THRUNG THRUNG

On View

This edition of Thrung Thrung, the second by this name and the fourth in the series, is the usual melange of news at home and from abroad and articles, light and weighty.

Besides the wonted reports of RSPN activities, we are pleased to showcase in this issue contributions from BLUE POPPY, a publication of the Sherubtse Nature Club, Singye Karm.

The environment and its concerns have now transcended the catch-phrase period and moved on to centrestage globally. In its own unassuming way, the THRUNG THRUNG seeks to present the issues both of local and universal interest.

IN THIS ISSUE

MHS WINS RSPN CULTURE COMPETITION

Motithang High School secured the first position in the RSPN organized Culture Competition based on environmental themes held at the YHS auditorium on 27 and 28 September 1994.

Yangchenphug High School came second and Punakha High School, third. The results were computed from the total of the best three performances.

In pursuance of the Society's broad objective of raising environmental awareness, the RSPN conducted this environmental Inter School Cultural competition for the schools in and around Thimphu. The contest was organized at three levels: Category A (Class IX & above and open to all), Category B (Class VI to VIII) and Category C (Class V & below). The competitors were to present items of dance, drama and song based on environmental themes in English and Dzongkha.

The winners (see results on the back page) presented a programme on a ticket basis at the same venue on 30 September and 1 & 2 October and the income generated allocated to creating a rolling fund to perpetuate the project.

The Chief Guest on the opening night was His Royal Highness Dasho Jigme Gesar Namgyel Wangchuck and the prizes were distributed on the last night by the RSPN President Sangay Thinley, the Joint Secretary of the Forestry Services Division.

HRH Dasho Jigme Gesar Namgyel Wangchuck with the President and staff of RSPN

VOLUME II NO. 2

17 DECEMBER 1994

THE RSPN ACTIVITIES JULY TO DECEMBER 1994

JULY

1
The Graphic Designer, Mr Pemaa Dorji resigned.

9 -10
The Environmental Education Unit launched its third Environmental Award Scheme on Farming Matters in Punakha.

29
Second Meeting of Multidisciplinary Taskforce for the Citizen's Report on the state of Bhutan's environment.

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AUGUST

1
Mr Karma Loday, the Accountant joined service.

2 - 4
Workshop at Bhutan Forestry Institute, Taba.

25
Visit to RSPN by SPIEC, President Mr Heitaro Adachi.

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SEPTEMBER

11
The Communications Officer departed fora training course at the Jordanhill College in the UK.
Project on the Environment and Culture launched.

19 - 23
Audition of the Environmental Culture Programme.

27 - 28
Competition at YHS Auditorium.

30
Variety entertainment.

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OCTOBER

1-2
Variety entertainment

Singye Karm members at World Food Day, T/Yangtse

8- 10
Exhibition of Farming Practice project findings cancelled on account of Punakha Flood.

16
World Food Day
Mr Mincha Wangdi, the EEO repreasented the RSPN at the World Food Day celebration held at Tashi Yangtse.

25
Environmental Edn. Unit leaves on a month and a half long Nature Club monitoring tour of the kingdom.

31
Ms Tshering deputed by WWF (Bhutan) to draw up administrative and management manual for RSPN.

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NOVEMBER

11
Release of RANGZHIN, Vol.II No. 2

30
Deadline for submission of papers for the Citizen's Report on the state of Bhutan's environment.

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DECEMBER

17
Release of THRUNG THRUNG Newsletter.
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CLIMATE CHANGE INDICATORS: ASIA & THE PACIFIC

Carbon Dioxide 1989 Emissions

Country	Industrial CO_2 Emissions	Industrial CO_2 Emissions Per Capita	Industrial CO_2 Emissions Per Unit GNP
Afghanisthan	6,272.8	0.39	
Bangladesh	14,113.7	0.13	0.69
Bhutan	33	0.02	
Brunei	4,473.7		
Cambodia	450.7	0.06	
China	2,338,612.0	2.13	5.69
Fiji	677.8	0.9	0.58
India	651,935.5	0.78	2.48
Indonesia	137,726.0	0.76	1.54
Iran	166,074.4	3.13	1.07
Kiribati	22		0.43
Korea, DPR	151,488.0	7.08	
Laos, PDR	227.2	0.06	0.37
Malaysia	49,061.0	2.82	1.38
Maldives	84.3		0.93
Mongolia	10,303.2	4.84	2.9
Myanmar	5,008.7	0.12	0.31
Nauru	124.6		
Nepal	934.3	0.05	0.3
Pakistan	60,972.6	0.51	1.55
Papua New Guinea	2,249.7		0.66
Phillipines	40,959.9	0.67	0.93
Solomon Islands	161.2		0.92
Sri Lanka	4,034.1	0.24	0.58
Thailand	77,680.5	1.42	1.13
Tonga	73.3		0.72
Vanuatu	66		0.45
Vietnam	18,169.8	0.28	2.64
	Units: 1,000 of Tons	Units: Tons	Units: Tons/1,000 1987US$

EFFECTIVE MICRO ORGANISM (EM) TECHNOLOGY

Based on the booklet on EM provided by CARD with experimental findings conducted and compiled by the students of Punakha HS as part of the RSPN Farming Matters Project 1994

What is EM?

EM is a culture solution of micro organisms which live in fertile soil in nature and are useful for crop production. This pleasant smelling culture solution is brown in colour and consists of four types of microbes:

1. Rhizobium
2. Lacto bacilli
3. Penicillium
4. Yeast

It was tried in several ways and found effective in suppressing the foul smell in toilets and animal farms, fermenting compost, recycling and drain water, controlling insects and promoting health of plants and farm animals.

Kyushu Nature farming in Japan states that EM was used in the farm to control pests and to increase soil fertility.

Characteristics of EM

It works efficiently without chemicals;

- A pleasant smelling solution, it can also be used to stop weed growth;
- EM solution should neither be exposed to direct sunlight (uv rays kill microbes) nor placed in refrigeration (low temperatures render microbes inactive). It should be stored in the shade and in a tightly lidded container. Under these conditions, it can be preserved for a year without any problem;
- EM ferments organic matter within a short period;
- EM can be multiplied easily by adding organic matters like molasses, green manure, animal dung and rice bran.

Objectives of EM

- Advancement of health
- Economic feasibility
- Sustainability
- Environmental preservation

How to prepare EM

Raw Materials

1. 1 litre of water
2. 1 cc of EM (original)
3. 1 cc of molasses
4. Plastic container with lid

Preparation

All the above ingredients are mixed thoroughly in the plastic container and the lid is closed tightly for 2 to 72 hours.

Neither Molasses nor jaggery was available in Punakha. Sugar was tried. It was noted that even after 72 hours, there was no change in the solution. Expansion of EM seemed to be very slow. It was assumed that this might have been due to the inability to attain the optimum temperature during the night.

However, the next day, it was kept under the sun, covered with a metal container and left for 30 minutes.

Why cover with a metal container?

- EM should not be exposed to direct sunlight.
- The metal container, being a good conductor of heat, raises the temperature of the air trapped between the metal and plastic containers. Optimum temperature (30-40°C) is favourable for the multiplication of the micro organisms.

Precaution

The temperature should not exceed by a large extent the optimum temperature. It may kill the microbes. To maintain a steady temperature around 40°C, a gap of 2 cm between the ground and the covering vessel was maintained.

Sugar therefore works as well as molasses or jagary in forming EM except that the solution is lighter in colour.

It can be prepared even in winter efficiently by placing the solution in the sunlight under a metal container. If the intensity of heat is less, it should be placed as described for the entire day. Care should be taken in the event of rainfall. On very cold days, it may be placed near the hearth. Note that a black container, because of its better absorbing capacity, will be more effective in cold areas.

How effective is the EM

Application

1. Suppression of foul smell

EM was sprayed in the toilet and in the rabbit wren once daily for two days. 5 cc was dissolved in 100 ml of water and sprayed. It reduced the foul smell and also killed some worms in the excreta.

EM was also mixed (1cc in 5ml of water) in rabbit's drinking water once a day for two days. As long as the EM was given, the dung didn't emit any bad odour. The dung changed in colour too to a yellowish green.

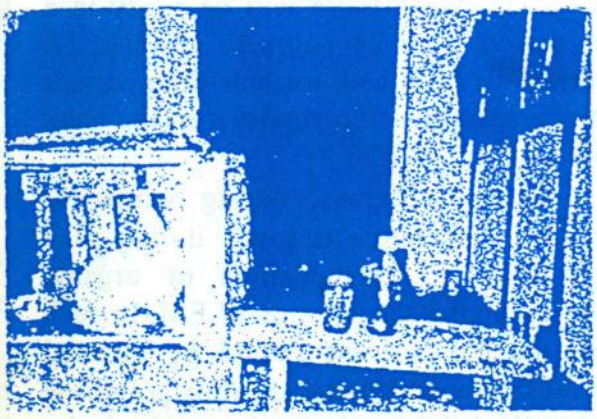
During that period, the rabbit was healthy and active though its intake was reduced.

Possible explanation

Rabbits by nature cannot store too much food. That is why generally their consumption will be limited. The EM solution must be digesting certain substances in the food which the rabbit is unable to do on its own. This additional digestion capacity might explain the change of colour and lack of smell in the dung.

2. Recycling of drain water

200 ml of dirty drain water was collected in a glass or bottle. The dust particles were allowed to settle. After 30 minutes, 5 cc of EM solution was added to the water and the mixture left undisturbed for 24 hours. Once in every two hours, the colour was noted. A gradual change of colour in the water was noted. The brown coloured drain water turned almost colourless and odourless. This was used as drinking water for the rabbit.



3. Fermenting compost

As the school did not have a suitable compost, it was not tried. However, the CARD officials have shown this venture to be as successful one. The compost, which usually takes 36 weeks to be prepared, gets ready faster with the addition of EM solution.

Why is the EM solution suitable in Bhutan?

In Bhutan, farmers generally use the farmyard manure, compost, and green manure. This traditional method is advantageous because it is economical, reduces transportation problems, and is easily available according to need. This fertilizer also maintains soil moisture by adding humus and is environmentally friendly. The only problem is the time involved in its preparation and decomposition or fermentation, i.e., a minimum 3-4 months time.

Suggestion

To solve this problem, it is suggested that the use of EM will hasten the process. As the EM solution helps in fast decomposition of the organic matter, when it is added to the compost pit, the manure will be ready in a short period from 24 hours to a week. (A variety of methods with variable time periods for the preparation of compost is in the book available from CARD).

In cold regions, during winter or when the temperature is low, it may take longer for the decomposition of organic matter even after the addition of EM. In such cases, the compost pit should be covered with a black-coated metal sheet or polythene paper, as it absorbs and traps heat effectively. This may help in speeding up the decomposition. EM can also be used in Bhutan to reduce the acidity in the soil.

Community compost pit

Soil acidity is a major problem in Bhutan predominantly in the regions where pine forests exist. It is an age old practice in Punakha district to burn the pine needles which enables and enhances the growth of grass in the following season. This provides pastureland for cattle. It is also a common cause of forest fires in Bhutan.

When the traditional practice of farming is analysed scientifically, it is understood that the burning of pine needles adds ash to the soil which neutralises or reduces the acidity of the soil and allows the grass to grow.

To solve the problems mentioned above, it is recommended that the villagers, with the help of the forest department, try to make 24 hour compost manure in the forest itself, using the green and dead leaves and by applying the EM solution. This procedure will:

- reduce the soil acidity as the needle cover is removed from the soil;
- save the farmer time. He can directly carry the fertilizer instead of the pine needles to make it back home;
- allow the growth of grass as the acidity decreases, i.e., sufficient fodder for animal grazing. This automatically diminishes the threat of forest fire.

LIST OF MAMMALS RECORDED IN BUMTHANG VALLEY APRIL/MAY 1989

Courtesy of Bhutan Tourism Corporation Limited

KEY

1 Phuntsholing to Paro (400 - 7500 feet)
2 Taktsang Monastery and Paro valley (7,500 - 10,000 feet)
3 Paro to Wangdi (including Dochhu La - 10,000 feet)
4 Wangdi to Tongsa (including Pele La - 11,000 feet)
5 Tongsa to Jakar (including Yotung La - 12,000 feet)
6 TREKKING Tangbi Lhakhang to Nga Lhakhang (9,500 feet)
7 TREKKING Nga Lhakhang to Phe-phe La (12,000 feet)
8 TREKKING Phe-phe La to Ugyenchhoeling (8,000 feet)
9 TREKKING Ugyenchhoeling to Phokphey (12,000 feet)
10 TREKKING Phokphey to Rudong La and back
11 TREKKING Over Rudong La (14,000 feet) to Pime (10,000 feet)
12 TREKKING Pime to Ungar (5,000 feet)
13 TREKKING Ungar to Obei (4,000 feet)
14 TREKKING Obei to Gorgan (2,500 feet) to Mongar (5,000 feet)
15 Mongar to Jakar (including Thrumshing La - 13,000 feet)
16 Jakar to Thimphu (over Yotung La and Pele La)
17 Thimphu
18 Thimphu to Phuntsholing (7,000 feet - 400 feet)
19 Phuntsholing to Bagdogra & flight to Delhi

I Abundant wherever seen
II Fairly common wherever seen
III Very small number seen
IV One sighting only

Rhesus macaque (*Macaca mulatta*)	14	III
Assamesa macaque (*M. assamensis*)	4	III
Common langur (*Presbytis entellus*)	1	II
Capped langur (*P. pileatus*)	14	II
Himalayan black bear (*Selenarctos thibetanus*)	6	II
Yellow throated marten (*Martes flavigula*)	2	IV
Eastern mole (*Talpa micrura*)	10	IV
Malayan Giant Squirrel (*Ratufa bicolor*)	10	IV
Orange-bellied squirrel (*Dremomys lokriah*)	10,16,18	II
Hoary-bellied squirrel (*Callosciurus pygerythrus*)	1	IV
Himalayan mouse-hare (*Ochotona roylei*)	3, 7-10	I
Muntjac (*Muntiacus muntjak*)	11-13	III

Priority Findings from RGOB Sectors

(Recommendations of NEC Workshop held in Paro, 19-21 September 1994)

POPULATION

Chhador Wangdi

BHUTAN'S POPULATION is growing at an estimated rate of more than 2.5 percent annually. At this rate, the country's present population of 600,000 will double within 30 years. Considering that all arable land is already under cultivation, and that ours is still an agrarian economy, both the well-being of the ecosystem and that of the people is put at risk.

Family planning to slow the growth rate should be accelerated by the Division of Health Services. Also, public awareness on population issues should be raised through the existing non formal education system, especially in rural areas. A Family Planning Policy which includes setting achievable goals for limiting growth should be formulated. Other related matters such as old age security and population education should also be addressed by the policy.

Increasing rural to urban migration is partly due to the lack of job alternatives to farming and the lack of services such as health, education, roads, etc., in rural areas. To reverse this trend, job alternatives to farming in rural areas should be developed. Emphasis on appropriate vocational training for rural school students could enhance this recommendation.

As more people migrate to urban areas, municipalities may be unable to cope with the increase. Thimphu's population alone is a clear indication of this escalation which must be managed on a long term basis.

URBAN & INDUSTRIAL DEVELOPMENT

Phuntsho Norbu

LAND FOR URBAN and industrial development especially in northern Bhutan is limited due to rugged topography. Urban centres and industries can only grow at the expense of extending into agricultural land, a scarce resource in Bhutan.

In order to minimise this consequence, urban and industrial development should be well planned. This requires strengthening the Department of Works and Housing and Municipal Corporation with trained professionals and legal powers to enforce rules and regulations. A municipality Act which will empower municipalities with legislation such as building codes, drinking water safety, and pollution regulations should be enacted.

A second issue is that forest and mineral resource use for industries conflict with conservation efforts. adverse effects of mines and industries can be minimised by value adding local raw materials. Also since power is cheaper in Bhutan than in neighbouring countries, importing minerals that incur high environmental cost while mining will help conservation efforts. The present industrial policy of emphasizing local raw material usage should be reviewed in this light. Also, a National Environment Protection Act, which includes mandatory IEEs and EIAs for all mines and industries, should be enacted.

Other issues in this sector include increasing pollution in urban areas from garbage, sewage and overburdening of urban facilities. The problem is compounded as more people continue to migrate to urban areas. Appropriate Environment Quality Standards and urban planning should be included in the Municipality Act to address these problems.

HYDROPOWER

Chhewang Rinzin

HYDROPOWER IS ONE of the most important resources of our country and has the highest revenue generating potential. However, increasing degradation of catchment areas upstream of hydropower projects threaten this potential. Strict legislation to protect critical catchment areas should be enacted and enforced. The legislation should particularly ensure that hydropower activities have priority over all forestry and mining activities and wood based industries in the critical catchment areas.

Adverse social and physical effects of hydropower projects such as disturbance of local flora and fauna and disruption of traditional local cultures could increase as the number of projects also increase. To mitigate such problems, appropriate technology should be used and separate EIAs conducted for hydropower. Also, legislation such as regulating firewood use in labour camps should be passed.

Other issues include preventive measures for possible disasters such as dam bursts and reviewing the Power Master Plan to cater to domestic needs as well.

TOURISM

Thinley Wangchuk

A DETRIMENTAL EFFECT of tourism on the environment is the depletion of slow growing tree species on trekking trails in fragile alpine ecosystems. To mitigate this effect, firewood should be substituted either by kerosene or gas and the Tourism Authority of Bhutan should regulate this activity.

Other concerns are that tourist campsites destroy vegetation and that garbage trails are created on trek routes. Trekkers should only use TAB designated campsites and should bring out non-biodegradable garbage. Biodegradable waste should either be buried or burned on the trek routes.

A common issue with the Religious and Culture sector is cultural pollution due to tourism.

RELIGION & CULTURE

Phuntsho

A KEY CONCERN of this sector is that, with development, the unwanted element of western materialism has also found its way into Bhutan. This is eroding our traditional eco-friendly values and can lead to the disruption of our balanced ecosystems. To counter this effect, existing spiritual and cultural institutions should be encouraged not only to restore their traditional relevance, but also to disseminate information on environmental conservation.

Another concern is the cultural pollution due to tourism. The TAB should ensure that all tourists are sensitised to local cultures. Also, well trained guides certified by the TAB should be made mandatory for the travel companies.

A third issue is that Bhutanese traditions, culture, and eco-friendly values are inadequately covered in the existing school curriculum. Consequently, the curriculum should be revised to address this issue. A related concern is that traditions passed down through oral means are being lost. Documentation of these oral traditions should be carried out.

ROADS

Phuntsho Wangdi

A MAJOR ISSUE of the Roads sector is the landslides and erosion caused by road construction. To mitigate this, planning and alignment of roads should be done prior to construction. Also, slopes should be stabilised through afforestation programmes. A third recommendation is that excavators should substitute bull dozers for road construction.

Another concern is that roadside quarries cause erosion and landslides. Quarries thus should be located in appropriate areas and used quarries should be rehabilitated. A licensing system should exist to ensure this practice.

LAND MANAGEMENT

Pelzang Wangchuk

WEAK INFORMATION based on nationwide land use is a hindrance to this sector. Reliable information for planning and management of land resources needs to be generated and exchanged in order to overcome this handicap. A clear definition of role play by different organizations in collecting and disseminating information is required to meet the above objective.

Land degradation due to erosion, tseri, overgrazing, fuelwood use, and other human activities is on the rise. Coordinated resource conservation policies which are socially and environmentally feasible should be formulated.

Tseri or shifting cultivation causes serious environmental damage. Also, tseri cultivators have not benefitted from development initiatives since they live in isolated and scattered settlements. To mitigate the environmental impacts and to raise the living standards of tseri cultivators, tseri should be gradually phased out and viable alternatives sought to shifting cultivation. Since 1963, the National Assembly has passed several resolutions to phase out tseri.

Other issues include revising the Land Act to consider land productivity in deciding land limits, and fragmentation of land holdings that results in rural to urban migration and over-exploitation of land.

FORESTRY MANAGEMENT

D.B. Dhital

LAND USE CONFLICT between forestry and grazing, forestry and tseri, and forestry and orchards is a priority issue with this sector. To reduce such conflicts, land use zonation based on slope and altitude should be made.

Another issue is that information on forest resources is scanty. A forest resources information system needs to be set up for making informed policy decisions.

Lack of people's participation in the management of forests is another concern of this sector. The existing social forestry programme needs to be strengthened and expanded throughout the kingdom.

A fourth priority is that there is increasing demand for arable land as the population grows and this has led to encroachment into forests.

Efforts to slow population growth, intensify agriculture production, and emphasising improved livestock breeds may reduce encroachment.

A fifth issue is the lack of trained people, funds, and ambiguous job demarcation within the Forestry Services. This has hampered the proper implementation of management plans. To overcome this handicap, more trained people are required.

Also, a steady source of funds for implementing plans are needed. The present practice of relying heavily on the Bhutan Logging Corporation for funds is not sustainable. Alternative funds will allow the desired DFO driven implementation of plans rather than the BLC driven practice.

The issues of Rangeland & Livestock Management, Biodiversity, RNR Research & Development, Watershed Management and Irrigation will be in the next edition of THRUNG THRUNG.

AGENDA FOR THE CONSERVATIONIST

By:
Shivaraj Bhattarai
Staff Advisor to Singye Karm

Conservation, in the broadest sense, has always been applications of ecology.Conservationists,unfortunately, are regarded as antisocial persons who are against any kind of development. But a real conservationist is one who is only against unplanned development that breaks ecological as well as human laws.

The true aim of conservation is to ensure the preservation of a quality environment that considers aesthetic, recreational, as well as product needs. Besides, the conservationist also has to ensure a continuous yield of useful plants, animals and materials by establishing a balanced cycle of harvest and renewal.

The need for conservation has become the topmost priority of the day. It would be more than appropriate to quote the disappointments and warnings put forward by Leopold in 1941, more than 50 years ago.

"Mechanized man, having rebuilt the landscape, is now rebuilding the waters. The sober citizen, who would never submit his watch or his motor to amateur tampering, freely submits his lakes to draining, filling, dredging, pollution, destabilization, mosquito control, algae control, swimmer's itch control ..."

"The concern for the environment shown throughout the world has benefited Bhutan greatly".

Nothing under the sun is spared by the "mechanised man" in his "amateur tampering". In spite of warnings from the conservationists and environmental specialists, world environment has suffered several ecological backlashes. The unlimited wants of ever increasing population continue to exert pressures on the limited natural resources. Having realized the urgency of conservation of natural resources in particular and the environment as a whole in general, it needs careful study and planning of each and every developmental programme to make them environmentally friendly.

The concern for the environment shown throughout the world has benefited Bhutan greatly. Before any major damage has been done to the Bhutanese environment, the development plan has incorporated environmental concerns. The concepts of sustainable development has found a prominent place in the present five year plan. This concept should be understood and interpreted in a broad and right perspective. The conservationists and the policy makers need to work hand in hand and not end up in conflict as is normally happening through out the world.

While several government agencies have initiated environment cells to monitor their planning, at least one has sprung up as a non-governmental agency. This certainly is a timely and welcome

happening. The role of a conservationist is to be played by these organizations; they will also see that development gets implemented in the true sense of the term.

The first and foremost agenda for these organizations is to identify the real environmental issues affecting the country. A lot of research must be carried out in the form of information gathering from the fields where agencies linked with agriculture, forestry, roads, industries, etc. are implementing their developmental plans. An integrated approach should be followed by these developmental agencies and be guided by the norms of environment conservation.

In the first place, it is the responsibility of these plan implementing agencies to see that their work is environmentally friendly and the manpower involved are adequately educated in terms of environmental implications. They should act responsibly without inviting the conservationist to monitor them.

To inculcate environmental awareness in the policy implementers, the concept of "Greening of curriculum" should also extend beyond the textbooks in schools. Emphasis should be given to all the in-country training institutes to include at last one subject on environmental issues mainly relevant to Bhutan.

Establishing a branch office of the environment in each dzongkhag could go a long way in monitoring all the developmental activities in that district and educating the local schools and the community. Having established a network of environmental authority throughout the country, the goal of sustainable development can certainly be realized.

The conservationists should be capable of leading and guiding the government agencies in the management of mineral resources, agriculture and forestry, wildlife, aquaculture, range and pollution control. Once the national issues are listed out and an integrated plan of action is prepared with a network of organisation, the conservation of the environment can be made a reality.

ON THE ROAD TO DISASTER

The number of water-scarce countries is expected to increase to 34 by AD 2025

Water-scarce countries in 1990

Algeria Burundi Isreal Kenya Qatar
Saudi Arabia UAE Bahrain CapeVerde Jordan
Malawi Rwanda Somalia Yemen Barbados
Djibouti Kuwait Malta Singapore Tunisia

Countries projected to become water-scarce by AD 2025

Cyprus Egypt Haiti Libya
Oman S. Africa Tanzania
Comoros Ethiopia Iran
Morocco Syria Zimbabwe

THE GOLDEN LANGUR
(*Presbytis geei*)

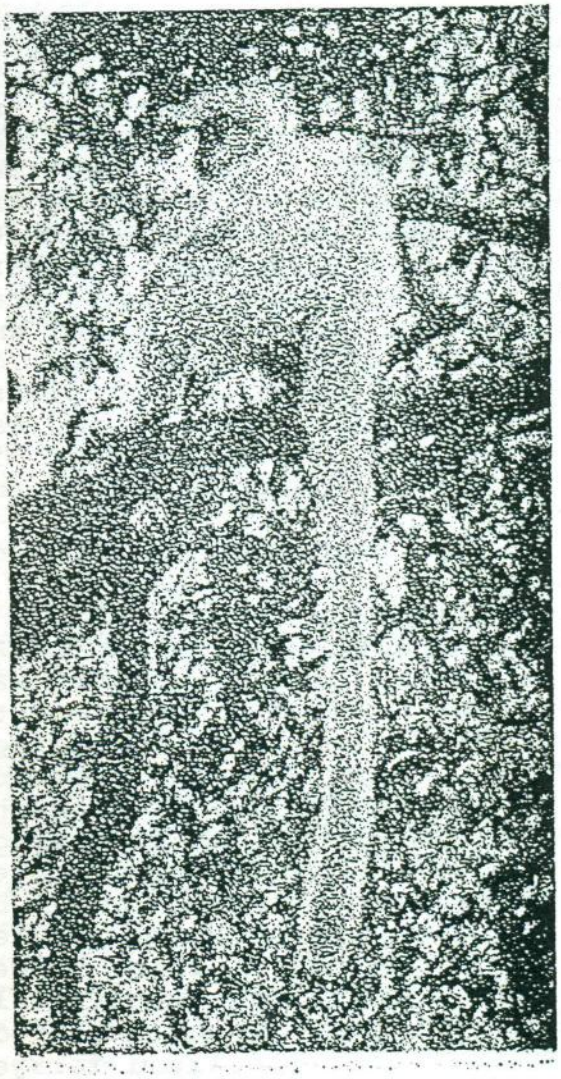
Abstract

A census of Golden Langurs (*Presbytis geei*), locally called Raksha, was conducted in the Mangde Chhu valley of Central Bhutan. The census transect fell within the newly established Black Mountain (*Jorwadurshing*) National Park. A total of 127 individuals in 19 troops were sighted along the 39 km transect. Using the arithmetic mean of all animal-to-transect distance as transect width, an area of 58.5 km^2 was covered as a sampling area. This resulted in an estimated density of 2.1 Golden Langurs per square kilometer in the sample area. Using this figure with the basic formula for density calculation and the known distribution and ecology of Raksha, a total of 4,341 golden langurs is estimated to survive in Bhutan.

The biggest threat to the Raksha in the census area is the unsustainable logging practices carried out by the Bhutan Logging corporation within the Black Mountain national Park. Valuable habitat is destroyed in the process of "rolling" logs down steep slopes to the logging road.

Population, Habitat and Behaviour

The habitat of Raksha in the study area consisted of alternating warm broad-leaved and chirpine (*Pinus roxburghii*) forest. The warm broad-leaved forest is "essentially a type of subtropical forest" which occurs between 2000-2300 metres (Grierson & Long-1983). The forest type was dominated by evergreen and deciduous broad-leaved tree species. Some of the species commonly used by



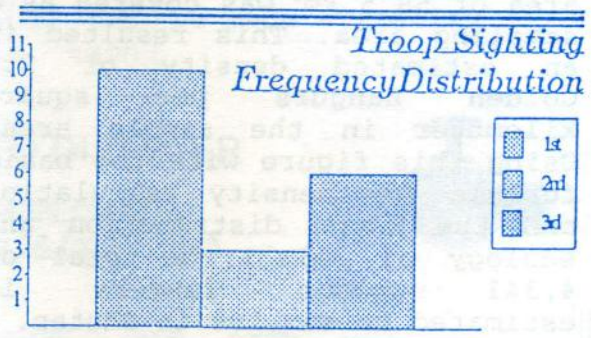
langurs to forage and rest in were *Engelhardia spp, Altingia excelsa, Sehima wallachi, Castanopsis spp, Quercus spp, Dichroa febrifuga, Ostodes spp,* and a variety of tree and shrub species belonging to the leguminosae family.

Raksha prefer to forage in deciduous trees that were budding during the season. Such trees mostly grew in more open areas that received more light. They were also foraging in leguminous shrubs. Contrary to reports of Golden Langurs being entirely arboreal (Ghosh & Biswas, 1974), langurs were sometimes seen on the ground. For instance, several troops were seen eating mineral salts at natural salt licks. Also, they were seen drinking water from springs and streams. Ghosh and Biswas (1974) had earlier speculated that golden langurs never drink water and consequently their urine was concentrated and little. However, urine of langur in the study area was dilute and quite voluminous. Golden langurs urinated and defecated when they encountered potential danger and prepared to flee. The faeces of langur, depending on what plants they have been foraging on, can be wet or dry. The scat is greenish-yellowish in colour and has an odour.

The average troop size of Raksha in the study area was 7.1 individuals per troop within a standard deviation of 2.8. An all male troop of 5 males was seen in Becheling. They seem to be sharing the same home range with a larger bisexual troop of 11 individuals led by an alpha male. Perhaps the all male troop consisted of sub-adults driven out by the bisexual troop by the alpha male. Although earlier reports maintain that golden langur are not territorial, observation of the Surgang troop revealed that the troop foraged within a range of 4 km sq. and avoided the troops at Becheling. However, the Surgang troop was sympatric with a troop of macaques; no hostile interactions were recorded between the two species.

The activity cycle of the Surgang troop can be broken down as follows: foraging from about 8 am to 11 am, resting from 11 am to 2.30 p.m., foraging from 2.30 p.m. to about 5 p.m., and roosting during the night. There was no particular tree used as for regular roosting. Tall trees, which provided good cover, were generally used. Sometimes a troop spent a night in the tree which they were foraging on in the evening and resumed feeding on the leaves of the tree when they started activity in the morning. On cloudy days the troops were active even during the regular resting period.

The average distance between troops sighted along the transect was 1.1 km with a standard deviation of 960.5 m. Troops sightings were most frequent during the mornings, followed by evenings. Troop sightings were lowest in the afternoons.



Excerpted from A Census of Raksha or Golden Langurs (Presbytis geei) in the Mangde Chhu valley of Central Bhutan: Population status, Habitat and Behaviour.

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Tashi Wangchuk
National Environment Commission

ENVIRONMENTAL NEWS WORLDWIDE

RUSSIA

With Russia now saying 'yes', the much awaited ANTARCTIC whale sanctuary will come into effect on December 6, 1994. Russia's agreement is a defeat for Japan's campaign to resume commercial whaling using Russian whalers. Now, Japan is also expected to give up its opposition to whale-saving campaigns.

Russia's decision followed a fierce struggle between environmentalists in Moscow, represented by the environment ministry, and the commercial lobby, which has high level connections in the committee for fisheries and in the foreign ministry.

Eventually, the environment ministry secured the support of 4 ministries, including the committee for fisheries.

SQUEAKY CLEAN SINGAPORE

Singapore has finally found a way to clean up its 'wet markets', the bazaars selling fresh meat, fish and poultry. They are so named because their floors are perpetually slippery with offal and blood, fish scales and water. The government has been tearing its hair out, but it could nothing as people protested vehemently every time there was a move to ban the markets. The wet bazaars are important centres of Singapore's culture, they argued.

But now the government is determined to launch high-tech farming and animal husbandry. It has created 8 agrotechnological parks stretching over 1,700 ha of government land, where fish are bred in aquariums, and hydroponic dairy, poultry and vegetable farms have been set up. Hydroponics is vital for Singapore's continued well being, since the country's land is too precious to be wasted on obsolete farming systems.

THAI DRIVE AGAINST DRIVERS

The Thai Government has come up with an ingenious plan to reduce traffic congestion. The idea is to create 2 dozen special car parks on the outskirts of the city, where commuters can leave their cars before taking a bus into the heart of town.

Sceptics are convinced that the plan will fall flat on its face. Similar schemes to restrict the entry of cars, which were introduced in Indonesia and Singapore, have failed. However, as a government transport planner points out, 'Maybe the super-rich will still take their cars - but they will be made to pay for their pleasure.'

BODY SHOP'S SLIP SHOWS

The green credentials of Body Shop, a highly successful British cosmetics company with a chain of 1,100 outlets in 45 countries, took a beating with allegations of flimsy environmental standards. The controversy was sparked off when Franklin Research & Development, a US-based investment company, sold off its 50,000 Body Shop shares in mid-July and advised its clients to do likewise.

The decision was prompted by an article to be published soon by the US-based Business Ethics magazine. The article calls into question almost all aspects of Body Shop's functioning, ranging from the composition of ingredients to its quality control record, animal testing and its trade with suppliers in developing countries. The magazine is taking no chances, however. To avoid British libel laws, it will not distribute copies in Commonwealth countries.

RWANDANS CIVIL WITH GORILLAS

Civil war in Rwanda has claimed 500,000 lives, but it has spared 60 rare gorillas in the Virunga mountains, a big draw for tourists in the past 15 years. A recent census has accounted for all but 2 of the creatures.

Of Rwanda's 650 mountain gorillas, a third live in Rwanda's northern mountains. Sixty of these big apes have been studied for many years at the Karisoke research centre, made famous by the late American naturalist, Dain Fossey.

DEATH TO THE PROTECTED

When Rafiki, a sea lion protected by the US government, was shot in the head at point blank range while swimming in the Monterey Bay in California,

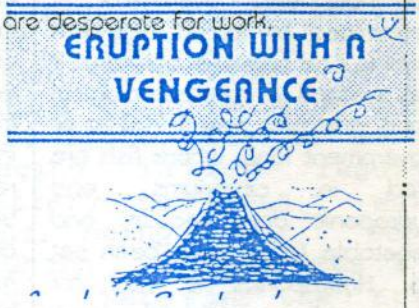
she became the latest victim of spiteful violence against endangered species. US Wildlife officers say that some people have developed this strange penchant for attacking protected animals, motivated not by the lure of lucre, but sheer spite.

There have also been cases of grizzly bears being mercilessly run over by local farmers using pickup vans. The killings have been dubbed as the 3s Syndrome: shoot, shovel and shut up. "There's a new meanness out there," says Rick Branzell, a special agent for the US Fish & Wildlife Service.

SACRED DUMPYARD

It is a commentary on the state of the world's indigenous peoples, the aboriginals in northern Saskatchewan, Canada, are willing to turn their sacred land into a nuclear dump in exchange for jobs. The 9 groups that make up the Meadow Lake Tribal Council are convinced that the state-owned Atomic Energy of Canada Limited has come up with a safe and technically feasible way of storing waste for generations. Environmentalists, however, are aghast. They accuse the government and the nuclear industry of callousness and for taking unfair advantage of the vulnerable natives, who are desperate for work.

ERUPTION WITH A VENGEANCE

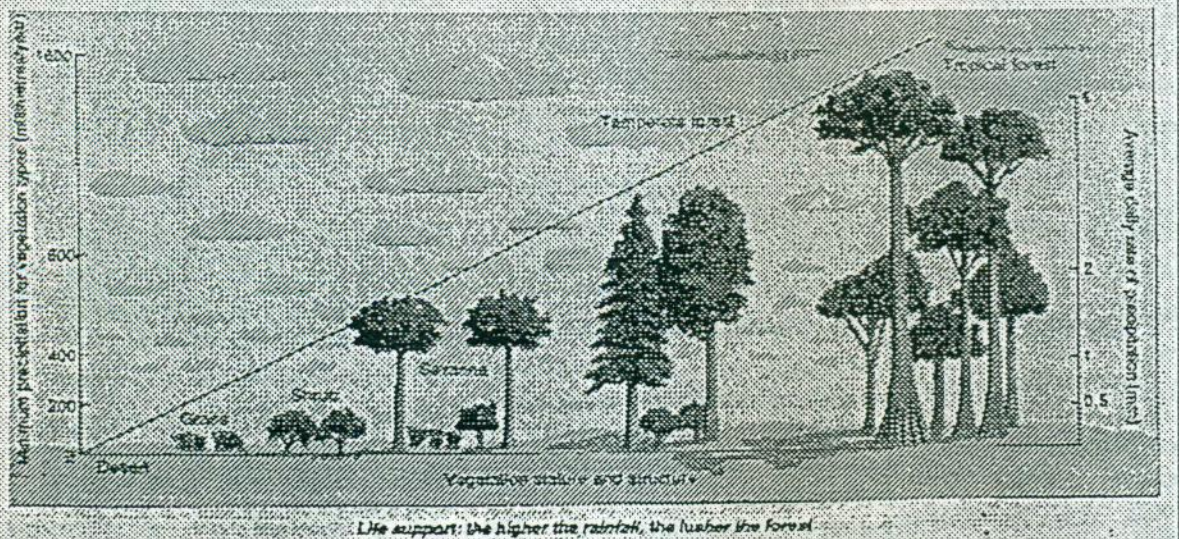


In late September, Vulcan and Tavurvur - 2 volcanoes near the port of Rababaul in Papua New Guinea, spewed out dense smoke and poisonous fumes, throwing the country into a panic. Suffocated residents were forced to flee the port, which was covered with volcanic ash had mixed with rainwater to form a grey mud that threatened to bring down buildings and trees. According to Leith Anderson, director of the National Disaster and Emergency Services, the eruptions were "the greatest disaster to hit Papua New Guinea in recent times".

OIL BURN

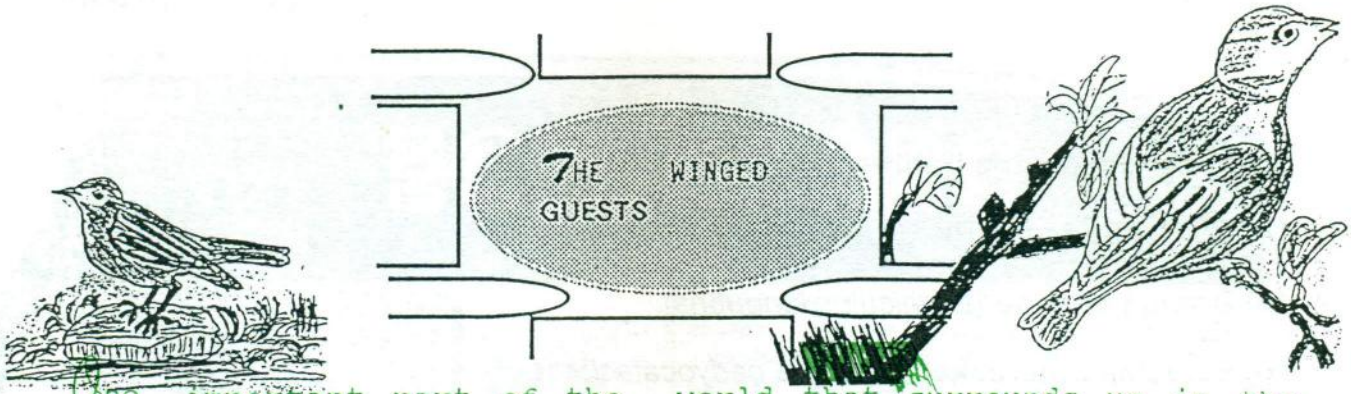
Yet another burning oil slick, the third largest reported in history, threatens the ecologically fragile Arctic. The 60,000-tonne slick in the Russian province of Komi has reportedly originated from leaks in a 47-km pipeline managed by Komineft, a Russian oil company.

According to US officials, the spill, releasing 8 times the oil spilled by the Exxon valdez, started way back in February, but disaster struck with the heavy rains in October. A dam built to contain the oil spill burst, letting it into two tributaries of the Pecora river, the Usa and the Kolva. The disaster has spurred a call by Greenpeace for "an international clean-up effort on the scale of the Gulf war oil fires".



Life support: the higher the rainfall, the lusher the forest

ENVIRONMENTAL NEWS WORLDWIDE



One important part of the world that surrounds us is the other creatures that share this space with us, and the most conspicuous of these are the birds. They are all around us, though we rarely stop to notice them. By taking an interest in birds and watching them, we create a link between us and the other life forms of this earth. This link we have lost over the years and thus have grown alienated from nature. Bird watching as a hobby is a fascinating way of re-establishing this link with nature. Bird watching is just an extension of the simple pleasure of looking at a bird. As a bird watcher, we learn to identify the birds first and then, as we go along, we understand more about its behaviour. Bird watching is an interesting hobby that can be practised by anyone any time. All we need is a pair of binoculars, a book on birds and a patient will. Here at Singye Karm, we have a bird watching division. Listed below are some of the many birds which visit our campus and some local areas or the other during the year.

1) Magpie robin (*Lopsychus saularis*)

2) Scarlet minivet (*Pericrocotus tiammeris*)

3) Black bulbul (*Hypsinetes madagascardebsus*)

4) Rusty cheeked scimitar babbler (*Pomatorhinns erythrogenys*)

5) Red vaunted bulbul (*Pycnomotus cador*)

6) Alpine swift (*Apis melba*)

7) Hons swift (*Apis attinis*)

8) Verditere phycaterner (*Muscicapa thalassina*)

9) Staty breasted rail (*Kalius aquaticus indica*)

10) Indian blue rock pigeon (*Columbia livia intermidia*)

11) Nepal yellow backed sun bird (*Aethopya nepalensis*)

12) Himalayan green tinch (*Carouelis spinoids*)

13) Long billed wren babbler (*Himator malacoptilus*)

14) Black headed shrike (*Lanius schach tricolour*)

15) Drongo chekoo (*Burniculus lungubris*)

16) Eurasian nutcracker (*Nucitera carlyocatacttees*)

17) Green necked tit (*Parus monticelus*)

18) Black spouted yellow tit (*Parus spilononus*)

19) Brown Shrike (*Canaius cristayus*)

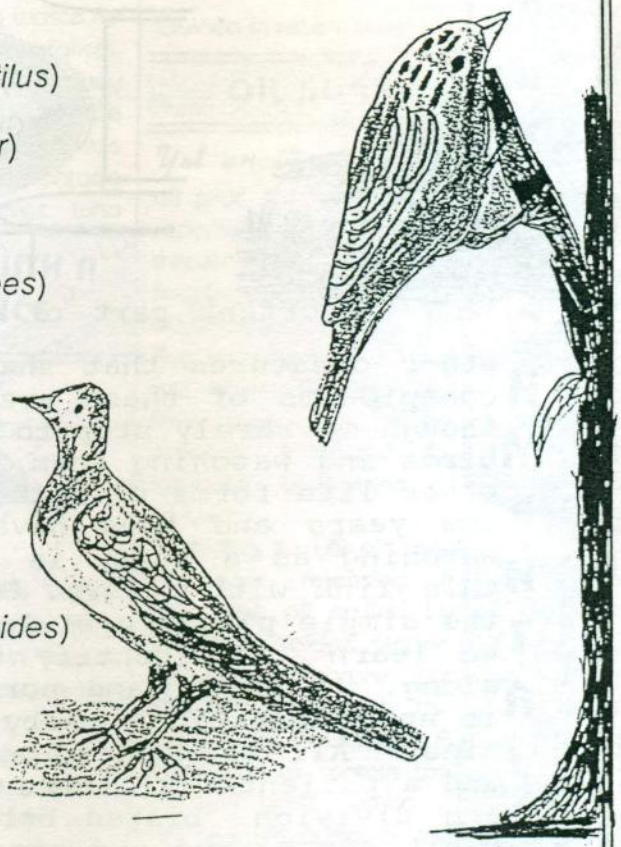
20) Spotted munia (*Longchura puntunlate*)

21) Hodgeson's pied wagtail (*Motacilla albasihoides*)

22) White eye (*Lostenoes raltebrosa*)

23) Golden bush robin (*Brithaeus cristatus*)

24) Moor Hen (*Bellinuia chioropus*)



25) Hoom (*Lepupa epops*)

26) Tibetan grey backed shrike (*Lanius tephronotul*)

27) Common lore (*Aegthima tiphia*)

28) House sparrow (*Passer domesticus*)

29) Tree sparrow (*Passer montanus*)

30) Hawk cuckoo (*Caculas varias*)

31) Himalayan cuckoo (*Caculus saturatus*)

32) Kutous turtle dove (*Streptopilia orgentalis*)

33)Spotted dove (*Streptopilia chinensis*)

34) Speckled wood pigeon (*Columbia hodgsonia*)

35) House crow (*Coryus spledens*)

36) Jungle crow (*Coryus maerorhynchos*)

37) Elwe's crake (*Amaurornis bicolour*)

ECO-SAARC

NEPAL

Indigenous Bridges Best

High mountains and deep gorges may no longer daunt the three million Nepalese who have to travel extensively in the trading season. A Swiss organization, Helvetas, is building bridges there and training engineers. It was all praise for the indigenous bridge builders, especially from Baglung.

"We studied the Nepalese bridges and were convinced that the villagers had unique bridge building skills. All they needed was material support like cement and steel cables to make the bridges more durable." said Robert Groeli, in charge of Helvetas in Nepal. They are so impressed that they have adopted certain techniques of the Banglungs. The Swiss organization has already completed 80 bridges in the Himalayan Kingdom.

Another Dam Shame

The proposed Arun III dam in Nepal has come under fire. The World Bank's newly established investigation panel, which deals with complaints from people adversely affected by the Bank's projects, has received a formal complaint - its first - on the dam. A group of NGOs in Nepal charged the hydel project with going against the Bank's policies and procedures, according to a *Financial Times* report. NGOs say that the high-cost project could lead to cuts in health and social services programmes and, the report adds, the construction of a 122 km road to the dam site would have adverse environmental effects.

SRI LANKA

Elephants Face Extinction

The Sri Lankan elephant faces extinction. Spokespersons for the Wild Life and Nature Protection Society, quoted in a *Panos* report, say that 94 elephants were killed last year, apart from the 70-odd elephants that die naturally of more natural causes. Wildlife experts such as Jayanta Jayawardene, author of the Sri Lankan Elephant, attribute the decline to development programmes which have led to human encroachment upon elephant habitats. In Sri Lanka, more elephants are killed when they stray into human settlements than from poaching.

Water:Wanted yet Wasted

About 170 million litres of water in Sri Lanka's capital, Colombo. The National water supply and Drainage Board supplies 236.39 million litres of water every day to metropolital Colombo and 263.67 milion litres to the suburbs. The bulk of this is wasted as residents of poor neighbourhoods, shanties, tenement gardens and slumdwellers do not feel any responsibility towards conserving water, which is provided free to them, according to a *Panos* report. Water is wasted through leaks in pipelines, compounded by consumers failing to turn off taps. Besides, water is also pilfered through illegal connections.

PAKISTAN

Waste Worsens Water

Pollution in the Karachi Fish Harbour has reached mind-boggling proportions, reports The Dawn. Throughout the year, the Lyari river carries wastes from the industries in the Sindh industrial estate to the harbour. The effluents comprise wastes from pharmaceutical, textile, chemical, tanning and petrochemical industries. After remaining in the harbour for some time, the effluents enter the sea through the Manora channel, wreaking havoc on the marine resources of the country.

Lahore's Luckless Lake

Once home to a rich variety of migratory birds from Russia, Siberia and Central Asia, the Gamaghar lake near Lahore, has been driven to the verge of extinction by an ill-planned irrigation system.

Inadequate drainage systems had led to high levels of waterlogging and salinity in nearby agricultural areas. To overcome this problem, Pakistan's Water and Power Development Authority undertook to lower the groundwater table by draining the waterlogged land. In the process, however, the Gamaghar lake was also drained, causing the wetland to shrink.

MALDIVES

Fisherfolk's Fears

Fisherfolk in the Maldives are worried that a recent government decision to allow foreign vessels to operate 120.68 km from the country's shoreline will rob them of their livelihood, as hi-tech ships capable of sinking thousands of fishing line into the ocean at one time will eat up the fish stock. According to Inter Press Service, about 25 foreign vessels have already begun working off the Maldives coast, one of which is reportedly using 2,500 lines simultaneously.

Good Riddance to Bad Rubbish

Tourism is dealing a body blow to the Maldivian government's waste management, as it leads to piling up of garbage every year. LTU, a German airline, has offered help in an innovative way. As passengers arrive in the Maldives, it issues them 30 litre garbage bags. The waste that the tourists generate while in the country is handed back to LTU before departure and is then flown to Germany for recycling and disposal.

BANGLADESH

Inflated Demands

An international panel of engineers and environmentalists, set up to oversee Bangladesh's Flood Action Plan, has criticised the draft "final report" on the plan. The report says that the total bill for the 162 projects will be 57 billion, against the $ 1 billion recommendation of donors, according to the New Scientiest (August 6, 1994).

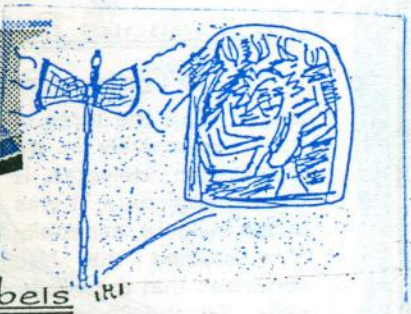
Experts said that the plan, a final version of which is to go to potential donors by year end, is over-ambitious and overlooks adverse environmental effects such as damage to the river fisheries.

Doctors Docketed

A Bangladesh High Court order brought a doctors' strike to a grinding halt. In response to a writ petition filed by Mohiuddin Farooque, secretary general of the Bangladesh Environmental Lawyers Association, a mandatory injunction was issued on October 4 directing the two week strike to be discontinued immediately.

The doctors were demanding the withdrawal of suspension orders, higher budget allocations for health education and services and better jobs.

INDIA



Durga's Decibels

For the denizens of Calcutta, Durga Puja is a time for noisy celebrations. But this year in mid-October, the West Bengal Pollution Control Board (WBPCB), with the help of 10 non-governmental organisations, undertook a campaign for a quieter puja.

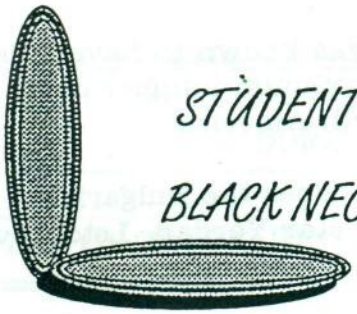
WBPCB teams monitored noise levels at 30 pandals and tried to convince organisers to control their volume, following a study completed last year. The study showed that noise levels at the average pandal was 10 to 15 percent higher than the daily average of 75 decibels, which itself is far above the norms set by the world Health Organisation.

The WBPCB is also lobbying for stringent measures for cutting down on noise during the puja next year. Foremost on the agenda is banning pandals near silence zones.

Eco-tourism: Enough is Enough

While the Indian tourism authorities continue to launch extravagant campaigns to attract visitors, the burden of the increasing numbers of wildlife tourists has goaded the Union ministry of environment and forests (MEF) into preparing guidelines to manage the tourist influx into the various national parks and sanctuaries.

The guidelines being prepared include restrictions on the number of tourists allowed into the parks and a strict code of conduct. The code of conduct includes a ban on teasing and feeding animals, carrying firearms, swimming in lakes or rivers, and speeding. Besides, the use of minibuses will be encouraged to curb the movement of the numerous individual vehicles.



STUDENTS TO CONDUCT BLACK NECKED CRANE COUNT

The Royal Society for the Protection of Nature (RSPN) will be organizing a nature trip to the Black Necked Crane habitats of Phobjikha (Wangdi Phodrang) and Bomdeling (Tashi Yangtse). The Society is proposing to invite students from selected schools of eastern Bhutan to be taken to Bumdeling and those of western Bhutan to Phobjikha. Subject to approval of the respective Dzongdas, DEOs, the Education Secretary and concerned parents, the RSPN wishes to conduct this outing for eastern Bhutan from 19 January 1995 and for western Bhutan from 24 to 28 January 1995.

The main objective of such a trip is, in general, to promote among youth an awareness of and active involvement in the protection of Bhutan's environmental heritage of flora & fauna, and, specifically, to foster and encourage the study of the black necked crane in its habitat and to undertake the annual winter count of cranes in Bhutan.

The RSPN requests the respective Dzongdas/Dungpas and DEOs to kindly instruct the concerned Principals/Headmasters to expedite the selection of the students. The matrix given below shows the school & the number of students to be chosen:

Schools	No. of students
◆ Jigme Sherubling HS	5
◆ Mongar HS	5
◆ Deothang Polytechnic	5
◆ Tashigang JHS	1
◆ Wamrong JHS	1
◆ Pema Gatshel JHS	1
◆ Nganglam JHS	1
◆ Lhuntshi JHS	1
◆ Tashi Yangtse JHS	1
TOTAL	21

ENVIRONMENT QUIZ

1. Who invented CFCs and when?
2. Name the Green Peace Fleet that was blown up by the French Secret Service in Auckland, N.Z., in 1985?
3. Which is the largest jungle area in the world?
4. What is Wallace's line?
5. Who discovered the Giant Panda?
6. In which sea would you find both marine and fresh water fish?
7. These rarest and the least known of the cat family which are radio-collared can be found in Bhutan. Name it.
8. What is the Red Dara Book?
9. Which monkey can pick up a peanut with its tail tip?
10. Which insects have the longest life span?
11. Which is the most dangerous bird?
12. Which is the deadliest animal?
13. What animal is known to wash its food before eating?
14. Who was known to have killed the maximum number of Bison in North America?
15. Whom does the Bulgarian soccer star Yordan Letchkov blame for his baldness?
16. What is unique about the hoatzin birds?
17. What is the highest that birds are known to fly?
18. Which is the largest otter in the world?
19. Which is the largest and fiercest eagle?
20. How far does the Arctic tern fly every year?
21. Which is the fastest bird?
22. This bird is an expert swimmer, but cannot fly and is an endangered species. Name it.
23. Name two avian species which can fly by echolocation.
24. Environmental changes independent of any human agency are thought to be the cause of the diminishing numbers of which rare New Zealand bird?
25. Which sea-animal can change its sex?

ANSWERS ON PAGE 28

Compiled by
Dorji Penjore
B.A. I (Eng. Hons.)

PROGRESS REPORT ON THE PROJECT 'CITIZENS' REPORT ON THE STATE OF BHUTAN'S ENVIRONMENT' (IN CHRONICLE ORDER)

IMPLEMENTING AGENCY : ROYAL SOCIETY FOR THE PROTECTION OF NATURE
DURATION: TWO YEARS W.E.F. JANUARY 1994

PLAN OF OPERATION

I. To obtain an environmental overview of the kingdom

A. Workshop

A workshop was conducted on 25-26 January at the Banquet Hall with a view to

- evolve a questionnaire that would portray a peoples' perception of the state of the environment;
- train a field team to carry out the survey.

Participating in the workshop were representatives from the concerned government divisions and international organizations and the field survey team of forty temporarily employed students.

The Chief Guest of the Workshop was the UNDP Resident Representative, Mr. Terence D Jones. Other guests included the Deputy Minister of the National Environmental Commission, Joint Secretary, Forestry Services Division and officials of related Ministries and Divisions.

During the course of the workshop, various aspects of the project were discussed. These included subjects, topics, chapters and papers that would feature in the publication. Further, the participants were divided into four groups and each group was required to come up with suggestions, recommendations and comments on the selected topics and the survey questionnaire. After much deliberation among the various groups, each group made their presentation. Each group's presentation was subjected to further comments, suggestions and recommendations by the other groups. Thus, a draft of the questionnaire, that would be taken to the villages, covering all important aspects of the environment and development, was completed. The draft of the questionnaire was then circulated among the participants for further comments after the workshop.

The Resource persons were Mss Sunita Narian and Akila Seshasayee from the Center for Science & Environment, New Delhi, India.

B. Survey

In order to conduct a national survey of this magnitude, the permission of the Hon'ble Home Minister was sought. After being briefed on the national survey and its importance to the project by the Project Manager, the Hon'ble Home Minister granted permission for the survey to be conducted vide a *Kasho* to all the Dzongdags requesting their cooperation with the RSPN survey teams.

The survey was carried out by four teams of ten field staff each supervised by an RSPN coordinator starting from the month of February. Due to time and budgetary constraints, the survey was restricted to the dzongkhags of Bumthang, Chhukha, Paro, Punakha, Thimphu, Tongsa and Wangdi Phodrang, each of which were to have 500 households appraised.

In March, the Project Manager toured the eastern dzongkhags of Lhuntshe, Mongar, Tashigang, Pema Gatsel and Samdrup Jongkhar to arrange for the survey to be conducted in these areas. However, due to budgetary limitations, survey teams could not be recruited to cover these areas. Instead, a suitable official from the local Dzongkhag authority was appointed to act as the coordinator and through the good offices of their respective dzongkhag administrations, necessary information was collected.

Owing to the sensitive situation prevailing in the south of the kingdom, a number of technical field personnel from the concerned sectors were appointed to execute the survey by the Project Manager during his tour to Samtse, Gaylegphug, Sarpang, Chirang, and Dagana in May.

In July, Mr. Lam Dorji, a field coordinator for the project visited the Dzongkhags of Samdrup Jonkhar, Pema Gatsel, Tashigang, Mongar and Lhuntse to evaluate the progress of the surveys in these Dzongkhags. He discussed the project and the survey with members of the Singye Karm, Sherubtse College's nature and trekking club that is affiliated to RSPN. It was agreed that Singye Karm would act as the focal point for the surveys in the east. Copies of the questionnaire were distributed to members of the nature and trekking club.

C. Compilation

The compilation of the initial survey, a responsibility of the Project's coordinator, is underway. Most of the survey feedback has been received and compiled. The findings of the other two regions are still to be received but are expected before the end of 1994.

D. Interpretation

It is envisaged that the interpretation of the survey findings will be utilized both as a chapter of its own and as supplementary material for the various other chapters in the Report.

II. To obtain input from the various sectors relevant to the issue

A. Contents/Contributors

A preliminary meeting of a core group to review the progress of the Citizens' Report project and discuss future developments, viz., the formation of a multidisciplinary taskforce and a decision on the contents of the proposed Report was held in the Forestry Services Division Conference Hall on 27 May 1994.

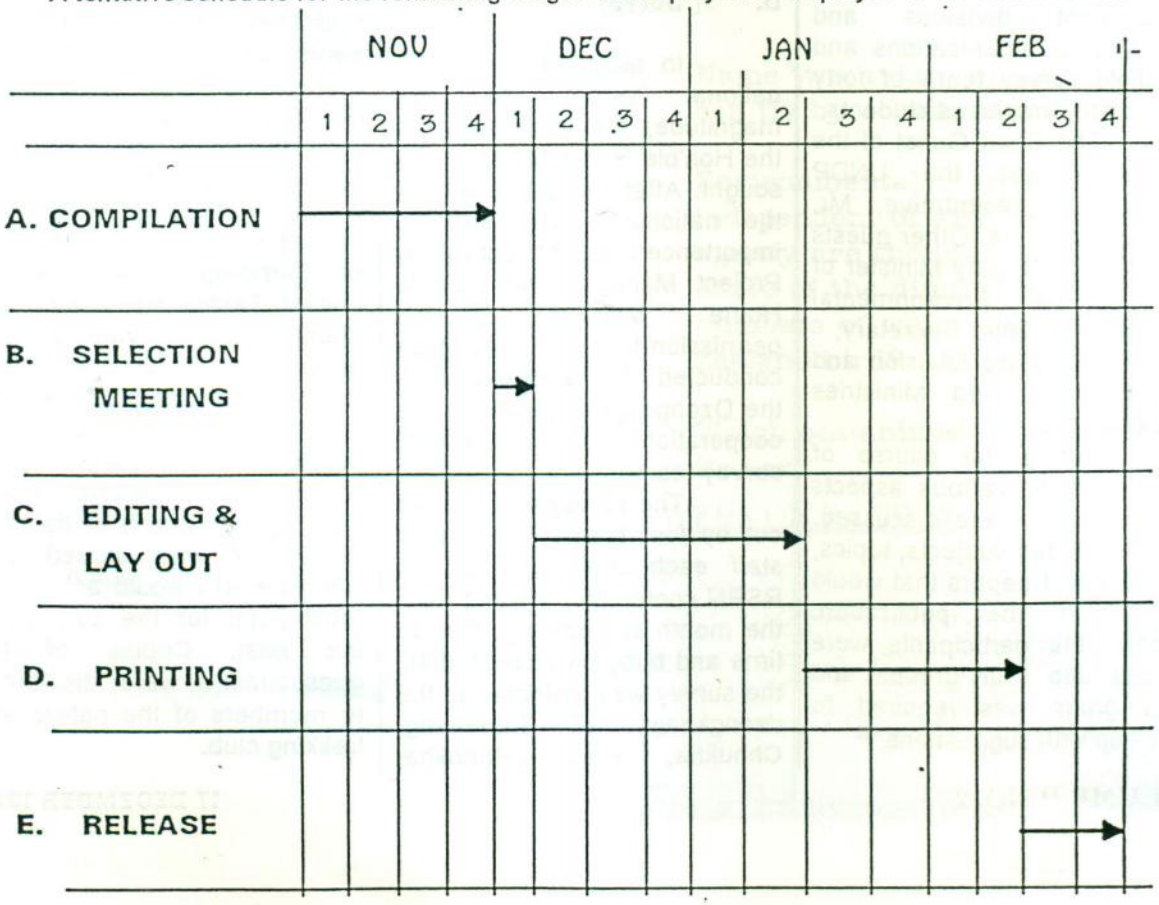
The Project Manager recapitulated on the developments to date *in re* the Citizens' Report Project, i.e., the successful completion of the first round of surveys and his delegation of the responsibility of covering the southern districts to a qualified person from a relevant sector in each of the dzongkhags. He then notified the gathering of the appointment of a Coordinator, John Michael Chiramal, for the project and handed over proceedings to the same.

The Coordinator distributed copies of the proforma to be used for the compilation of data collected in the survey and invited comments. It was accepted as being adequate for the purpose. A tentative list of contents was next circulated for criticism. The recommendations received *vis a vis* the list and the suggestion of a contents / contributors matrix have been incorporated.

Correspondence including the above enclosures was initiated with the members of the proposed multidisciplinary taskforce seeking their consent to authorship and informing them of a meeting at the RSPN on 29 July 1994.

The deadline for submission of papers, originally slated as 31 October, was deferred due to extenuating circumstances to 30 November 1994.

A tentative schedule for the remaining stages of the project is displayed in the table below:



ENVIRONMENTAL EFFECTS OF A NUCLEAR WINTER

ASSAULT	EFFECT
Widespread darkness	Photosynthesis curtailed Plant productivity curtailed
Very cold continental conditions	Widespread extinction of animals
Wild fires	Organized agriculture would be unlikely
Toxic smog	
Additional ultraviolet light	Widespread ice formation in the northern hemisphere
Release of poisonous chemicals into soil and water	Potential food sources would not be available to humans or animals
Increased level of nuclear radiation	Food sources contaminated by radiation and toxic substance
Siltation and sewage pollution of lakes, rivers and ocean	Storms at coastal margins would stress shallow water ecosystems
Violent storms	

For man:

Loss of shelter and fuel supplies; starvation; lack of clean water; malnutrition; lack of medical systems; psychological stress; societal support systems for food, energy, transportation, medical care, communications, etc., would cease to function.

SAVETREES

ENVIRONMENTAL IMPACT ASSESSMENT SURVEY

A day's survey on paper consumption by students in Sherubtse College was conducted with the intention of assessing the collective impact on forests as a result of individual consumption. Data have been obtained from respective classes and excludes paper consumed in doing homework etc.

DATA COLLECTION SHEET

Roll No.	Period	Paper Consumed (N/F)

N- Notebook pages
F- Foolscap Sheets

DATA OBTAINED

Class	Sc N	F	Com N	F	Arts N	F
XI	582	141	268	25	28	54
XII	535	210	497	62	296	100
Year >	I		II		III	
Disc.	N	F	N	F	N	F
English	30	25	8	20	199	42
Economics	34	69	4	137	35	33
Commerce	36	167	17	71	109	15
Science	19	76	39	52	55	14

Totals: (for one day)

N = 2791
F = 1223

Assumption: 2N = 1F

Total number of students in the college: 520

Therefore, **average no. of papers** consumed by each student in one day. (2791/2)+1223) divided by 520 = 5 papers.

Assuming that a medium sized tree produces 60-70 papers, the **number of trees cut down** to meet requirement for the daily consumption by students at Sherubtse alone can be calculated as follows: (520 x 5)/65 =40 trees.

Thus we can see that collectively the Sherubtseans are responsible for the loss of 40 trees everyday!

In a year, excluding weekends and holidays, **the number of trees felled** to meet our consumption requirements can be estimated thus: 214 days x 40 = 8560 trees.

At an individual level, we do not realize the stupendous harm inflicted on forests due to our needs. As illustrated, the collective impact can be extremely horrifying.

If we think that we paid for the papers and can consume them in any way we like, we are mistaken. Collective resources are depleted and we contribute a major share of it. We are not saying that one should stop using paper but that we must reform our consumption pattern and be *thrifty*, i.e., eco-friendly.

Here's how:

- **Recycle** in every possible way. Use empty sides of discarded papers for practising maths, drawing rough sketches, etc..
- **Write fully** on the first page before moving on to the next.
- **Smaller** handwriting can save space.
- **Collect** scrap paper and give (or sell) them to scrap dealers/recyclers.
- **Minimise** extravagant consumption wherever and whenever possible.

NEWS

Every Japanese consumes 130 kg of paper every year. The main source of raw material for the Japanese paper making industries is the Brazilian rainforest (Amazon), whereas every Brazilian consumes 30 kg of paper annually.

Sonam Kinga & Dorji Penjor
B.A.(Eng Hons) I

The bad side of Ozone

Ozone is an enigma. In the upper atmosphere, it is a good thing.It shields the Earth from ultra violet radiation. Close to the ground, ozone is a hazard.

***it damages* plants and many materials from rubber to textiles;**
***it hastens* the formation of acid rain,**
***it may trigger* asthma attacks and bronchitis.**

Ozone is formed in sunlight by photochemical reactions between nitrogen oxides and traces of hydrocarbons in the air. Motor vehicles produce both - over Britain, around two-thirds of the ozone is generated by vehicle exhausts. Power stations are among the other sources of nitrogen oxides. Hydrocarbons come from everything from industrial solvents to the methane from ruminating cattle and leaking North sea gas.

Not surprisingly, the amount of background ozone close to the ground has roughly *doubled* over Europe in the *past three decades*.

There is a debate about how best to reduce the formation of ozone.

The amount of the fastest reacting hydrocarbons, such as alkanes and alkenes emitted by vehicle exhausts, probably accounts for the peak concentrations of ozone in the summer. But there also slow-acting hydrocarbons, such as methane, in the atmosphere which may take years to react with nitrogen oxide and form ozone. They are so common that ozone may best be stemmed by controlling nitrogen oxides.

Ozone is but one of the chemicals produced by reactions betwen pollutants in sunlight in industrial areas and which accelerate the formation of acid. One consequence of this increasingly reactive chemical soup in the atmosphere is the formation of heat haze, which is usually an aerosol of sulphates and nitrates. Such a soup, near Los Angeles, recently produced a fog with a *p*H of 1.7.

SINGYE KARM NATURE CLUB NEWS

WORLD EARTH DAY

COMMEMORATED

Singye Karm joined the rest of the world in observing the World Earth Day on 22 April. A wall magazine was displayed portraying various problems the Mother Earth is suffering from, their sources and suggested solutions.

Many Sherubtseans rushed to take part in the RSPN sponsored world earth day essay/poetry competition through the club. All entries were directed to RSPN, Thimphu.

SILVER JUBILEE CEREMONY

30 April 1994 saw the closing ceremony of Sherubtse's Silver Jubilee Celebrations. Singye Karm joined hands with the Silver Jubilee Committee in organising a tree plantation ceremony for the guests. Sherubtse's alumni and distinguished guests helped thirty saplings find their root on the college campus soil. Under the proper care of Singye Karm and the college Tree Group, all the saplings are heading safely towards their treehood.

RSPB DONATION

BINOCULARS

The beginning of May brought good news for birdwatchers of Sherubtse. The Royal Society for the Protection of Birds (RSPB) of the United Kingdom donated seven pairs of binoculars to assist Singye Karm in ornithological activities. Bird watching is one of the regular features of Singye Karm. The equipments were received through the WWF, Bhutan Programme, Thimphu.

NEW MEMBERS

WELCOMED

Singye Karm gained in membership for 1994-1995 academic session. As opposed to the usual habit of accepting most members from the degree section, this year, a new criteria has been laid for the same. Each class was allotted a definite number of membership in order to have a good inter disciplinary and interclass association within the club. Since the club has a limited capacity, many students had to be turned back. For them, it is another year of patience to be a member of the Sherubtse Nature Club. This year Singye Karm has 41 members, the highest in the club 's five year history.

SOCIAL FORESTRY CUM CORONATION

CELEBRATIONS

Coronation day is always celebrated hand in hand with Social Forestry Day. In Sherubtse, the latter programme is always coordinated by Singye Karm. This year, the club and the tree group members procured tree saplings from Trashigang range office. About 400 saplings carpeted the Sherubtse Campus II on the 2nd of June. The students and staff members were led by Dasho Zangley Dukpa, the Principal, Mr T. S. Powdyal, the Vice Principal and Lopen Jampa Chogyal, the Assistant Principal.

ENVIRONMENT

OBSERVED

It was around the middle of university examinations. Everyone at Sherubtse was busy with studies. However 5 June easily managed to divert the attention of Sherubtseans from their books. Posters, cartoons and articles piled into the Nature Club's office for display. That day, students reiterated their commitment to spreading awareness among the populace and supporting eco-friendly practices for our health through the health of environment. A message from His Excellency, the Dy. Minister for Environment was also put up on the club's wall magazine.

ANSWERS TO ENVIRONMENTAL QUIZ

25. Oyster
24. The Takahe
23. The cave swiftlet and the oil bird
22. The galapagos flightless cormorant
21. The swift, timed at 170 kmph
20. Dividing its year between the poles, 35000 km approx.
19. Harpy eagle of South America
18. Pteronura brasiliensis, which grows up to six feet
17. Alpine chough have followed mountain eers up to 24,600 feet in the Himalayas. Bar-headed geese have been flying over the Mount Everest.
16. It has an extra pair of claws on its wings, the only bird to retain this characteristic of its prehistoric ancestors
15. The Chernobly Nuclear Disaster, the Ukraine
14. Buffalo Bill (Real name: William Frederick Cody)
13. Raccoon
12. The Sea Wasp
11. Cassowary
10. The splendour beetles, some of which remain in the larva stage for more than 30 years
9. Spider monkey
8. It is the list of endangered species ofanimals, etc, kept by the International Union for Conservation of Nature and Natural Resources
7. The snow leopard
6. The Baltic sea
5. The French Missionary naturalist Pere Armand David, 1869
4. It is a boundary line between the Oriental and Australian Zoo-geological regions
3. The Amazon-Orinoco rain forest
2. Rainbow Warrior
1. Thomas Misley, 193

SCIENCE SNIPPETS

RISING SEA LEVELS AND MELTING ICE CAPS

ONE OF THE immediate effects of the ascending levels of carbon dioxide in the atmosphere is an increase in *global mean temperature* whose consequence is a rise in sea level. This is already happening. Sea level has risen by about 15 centimetres during the 20th century, and the rise is very much in line with the rise in temperature that has occurred over the same interval. Most of this rise can be explained simply in terms of the thermal expansion of sea water. Only a little extra water has been added to the sea, by melting glaciers on mountains at low latitudes. Paradoxical though it may seem, at present the polar ice caps may be *increasing in size*. This is because more moisture is evaporating at low altitudes, and this is falling as snow near the poles, where it is still cold. A global warming of about 2° C, possible within 40 years, will increase sea levels by a further 30 centimetres or so, largely because of the expansion of sea water.

But one "scare story" associated with the greenhouse effect is dismissed by the experts. This is the fear that the entire West Antarctic ice sheet might collapse, sliding into the ocean and raising sea levels worldwide. Some calculations do suggest that once the world warms by about 4° C (which could happen before the next hundred years is over), the ice sheet might "collapse". But what glaciologists mean by a collapse is still a slow process by everyday standards - it would take several hundred years for all the West Antarctic ice to slide into the sea, eventually raising sea levels by about 5 metres or more, but only at a rate of about one or two centimetres a year. There would be ample time to walk out of harm's way, although the impact on coastal cities and low-lying countries like Bangladesh and the Netherlands, would be catastrophic in the long term.

BEAUTY PARLORS: A PAIN IN THE NECK?

YOU LOVE THOSE swatches of lustrous, flowing hair, but visits to the beauty salon may do more harm than good. After a year of extensive research on blood flow to the brain, New York based neurologist Michael Weintraub found that the risk of stroke is far greater when the neck is arched or twisted into extreme positions - as in beauty salons, when painting a ceiling or when undergoing prolonged dental work - than was earlier believed.

According to Weintraub, 2 vertebral arteries extend from the heart to the back of the brain. These are encased in a bony tunnel formed by projections from the neck vertebrae. Due to their close proximity to the bones in the neck, says Weintraub, these arteries are twisted and compressed when the neck is bent in extreme positions, reducing blood flow to the brain.

Vitamin C: The Smoker's Saviour

A PIECE OF good news for those who cannot give up smoking - take a lot of vitamin C and you could avert heart and lung diseases caused by cigarette smoke.

A team of German and US scientists successfully tested the hypothesis on hamsters exposed to cigarette smoke. Vitamin C, say researchers, is capable of preventing 90 percent of the damage caused by cigarette smoke to white blood cells. The damaged white blood cells tend to clump together and stick to the blood vessel walls, causing arteriosclerosis - the thickening of the arteries - which can lead to heart and lung diseases.

Meanwhile, a study conducted as part of a major programme to track the sources of particles in the smog over Los Angeles, has identified cigarette smoke as contributing up to 1.3 percent of the total particulate matter.

According to Glen Cass at the California Institute of Technology, although contribution by cigarette smoke is small, it is one of half a dozen minor sources which account for one-fourth of the city's air pollution.

RESOURCES

The energies coming into our system are **such natural forces as sun, wind, and rain.** Living components and some technological or non living units built into the system translate the incoming energies into useful reserves, which we can call *resources*. Some of these resources have to be used by the system for its own purposes (stocks of fish must be maintained to produce more fish). An ideal technology should at the very least fuel itself.

The surplus, over and above these system needs, is our *yield*. Yield, then, is any useful resource surplus to the needs of the local system and thus available for use, export or trade. The way to obtain yield is to be conservative in resource use, for energy, like money, is much more easily saved than generated. Resource saving includes recycling waste, insulating against heat loss, etc.. Then, we can work out paths or routes to send resources on to their next "use point".

If the aim of functional design is to obtain yields, or to provide a surplus of resources, it is as well to be clear about just what it is that we call a resource, and what categories of resource there are, as these latter may affect our strategies of use. In short, we cannot use all resources in the same way and to the same ends. Ethics of resource use are evolved by knowing about the results of resource exploitation. Forests, air, soil, water, sunlight and seeds are resources that we all regard as part of our common heritage.

Forests, air, soil, water, sunlight and seeds are resources that we all regard as part of our common heritage.

A second category of resource is that which **belong to us as group, family, or person:** those fabricated, ordered, or otherwise developed resources that people create by their work, and of which a presence or absence does not apparently affect the common resource. What we create, however, *is always made from the common resource*, so that it is impossible to draw a line between these categories.

What other ways can we look at resources? Let us try a use-and-results approach. What happens if we use some resources, if we look upon them as a yield? We then find that a response or result follows. resources are:

1. THOSE WHICH INCREASE BY MODEST USE.

Green browse is an example: if deer do not browse shrubs, the latter may become woody and unpalatable. Also, a browsed biennial, unable to flower, may tiller out and become perennial (e.g. the fireweed *Erechthites* nibbled by wallaby in Tasmania). Seedling trees can be maintained at browse height, but if ungrazed, "escape" to unbrowsable height and shade out other palatable plants. *Overgrazing* may (by damage) cause extinction of palatable selected browse and browsers, but underbrowsing may cause similar effects. *Information* is another resource that can increase with use. It withers or is outdated if not used. Too little impoverishes a system, but when freely used and exchanged, it flourishes and increases.

2. THOSE UNAFFECTED BY USE

In impalpable terms, a view or a good climate is unaffected by use. In palpable terms, the diversion of a part of a river to hydroelectric generation or irrigation (the water returned to the stream after use), is also unaffected, as is a stone pile as mulch, heat store, or water run-off collector. A well managed eco-system is an example of resources unaffected by use.

3. THOSE WHICH DISAPPEAR OR DEGRADE IF NOT USED

For example, an unharvested crop of an annual, or a grass which could be stored for the winter, irruptions of oceanic fish, swarms of bees or grasshoppers, ripe fruit, and water run-off during rains.

4. THOSE REDUCED BY USE

For example, a fish or game stock unwisely used, clay deposits, mature forests, and coal and oil.

5. THOSE WHICH POLLUTE OR DESTROY OTHER RESOURCES IF USED

Such as residual poisons in an ecosystem, radioactives, super-highways, large buildings or areas of concrete, and sewers running pollutants into the sea.

Categories 1 to 3 are those most commonly produced in natural systems and rural living situations, and are the only sustainable basis of society. Categories 4 and 5 are as a result of urban and industrial development, and if not used to produce permanent beneficial changes to the ecosystem, become pollutants (some are permanent pollutants in terms of the lifetimes of people).

It follows that a sane society manages resources categories 1 to 4 wisely, bans the use of resource category 5, and regulates all uses to produce sustainable yield. This is called resource management, and has been successfully applied to some fish and animal populations, but seldom to our own lives. Investment priorities can be decided on the same criteria, at both the national and household level.

Policy Of Resource Management

A responsible human society bans the use of resources which permanently reduce yields of sustainable resources, e.g. pollutants, persistent poisons, radioactives, large areas of concrete and highways, sewers from city to sea.

Failure to do this will cause the society itself to fail, so that programmes of highway building and city expansion, the release of persistent biocides, and loss of soils will bring any society down more surely and permanently than war itself.

Immoral governments tolerate desertification and land salting, concreted highways and city sprawl, which take more good land permanently out of life production than the loss of territory to a conqueror. Immorality of this nature is termed "progress" and "growth" to confuse the ignorant and to supplant local self-reliance for the temporary ends of centralized power.

The key principle to wise resource use is the principle of "enough". This is basic to understanding societies in chaos or systems in disorder. Today superhighways and overpasses in Massachusetts alone need some 400 billion dollars to repair, and the collapsing sewer systems of London and New York some 80 billions. Neither Massachusetts, London or New York can raise this money, which shows that an unthinking historical development strategy can cripple a future society. Today's luxuries are tomorrow's disasters.

Principle of Disorder

Any system or organism can accept only that quantity of a resource which can be used productively. Any resource input beyond that point throws the system or organism into disorder; oversupply of a resource is a form of chronic pollution.

Both an over- and under-supply of resources have much the same effect, except that oversupply has more grotesque results in life systems than undersupply.

To a degree, undersupply can be coped with by reduced growth and a wider spacing or dispersal of organisms, but oversupply of a resource can cause inflated growth, crowding and sociopathy in social organisms.

In people, both gross over- and under-nutrition are common. Ethical resource management is needed to balance out the pathologies of famine and obesity.

THE RESULTS OF THE RSPN INTER-INSTITUTIONAL ENVIRONMENTAL CULTURE COMPETITION

DRAMA

Category A (English)

1st: Yangchenphug HS
2nd: Motithang HS
Chhukha HS

Category B (Dzongkha)

1st: Punakha HS
2nd: Motithang HS

DANCE

Category B

1st: Rinchen Kuenphen PS

Category C

1st: Khasadrapchu PS

SONG

Category A

ENGLISH
1st: MHS
2nd: The Drifters

Category B

ENGLISH
1st: PHS
2nd: YHS

Category C

ENGLISH
1st: Chang Gangkha PS
2nd: Jigme Namgyel PS

Category A

DZONGKHA
1st: PHS
The NewBeat Band

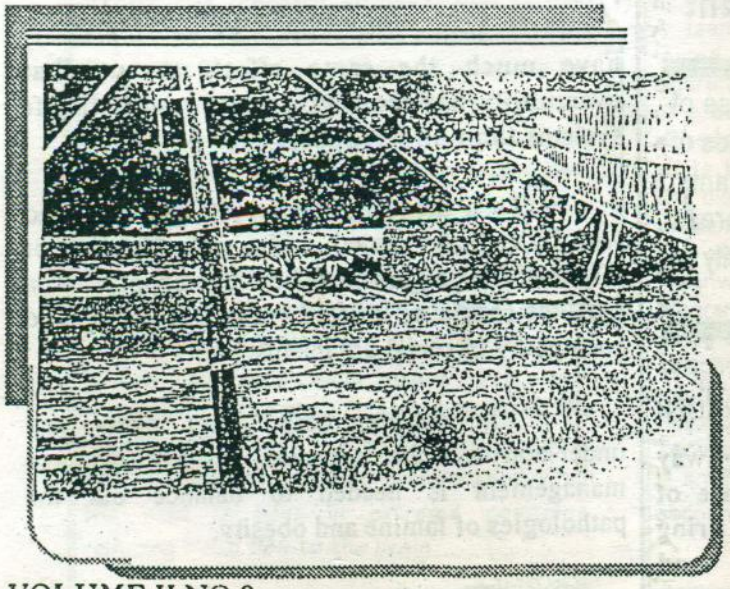
Category B

DZONGKHA
1st: MHS
2nd: SRS

OVERALL AVERAGE RESULTS
(Based on best three performances)

1st: MotithangHS
2nd: YangchenphugHS
3rd: PunakhaHS

Scene of the Punakha flood caused by the partial outburst of Lugge Tsho



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