

Sustainable Development Asia Pacific

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In this Issue...

From the Editor's Desk (pg 2)

Guest Article.... **Managing Urban Sprawl for Achieving Sustainable Urbanisation** *by H. S. Sudbira & T. V. Ramachandra* (pg 3)

Just for fun.... **Crossword** (pg 5)

Feature Article.... **Fluoride Contamination** *by Poornima K. K* (pg 6)

Window to the Asia-Pacific.... **Tuvalu** (pg 9)

Spotlight.... **Japan for Sustainability** (pg 11)

News from all over (pg 12)

Sustainability in Practice.... **The One Acre Tree Based Farming System** (pg 13)

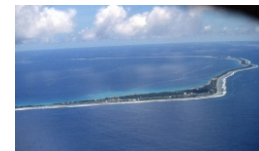
Food for Thought.... **Did you know?** (pg 15)

Red Alert.... **Japanese Night Heron: Struggling to Survive** (pg 16)

Interview.... **Mohammadulla Koshani** (pg 17)

Career Wise.... **Online Training Course for Certified Environmental Hygienist** (pg 20)

Forum for Sharing Sustainability Ideas.... (pg 21)



From the Editor's Desk

The World Population Day falls on the 11th of this month. With the world population growing relentlessly (we are now 6.6 billion), the increasing demands on natural resources are creating more problems for the environment. The task of making development sustainable is thus getting more important with each passing day.

The International Conference on Environmental Education (Tbilisiplus30) is calling for papers - please see the box at the bottom of the page for more information.

We are also looking for contributions to the various columns in APNN. Please send in your contributions in the form of articles and case studies relating to problems in your area, as well as information on courses, organisations and events that would be of interest to our readers.

Happy reading!

The Editorial Team

Here is a selection of comments from readers!

(In response to the issue on Climate Change) We are looking at (popularising) CFLs (among) the Small Island Developing States (SIDS).

The Hon. Tom Roper, Board Member (Climate Institute) & Leader (Global Sustainable Energy Islands Initiative)

APNN is interesting and informative. I wish all success to the newsletter and to CEE KSD.

Rajendra, Asian Institute of Technology, (NRM/SERD), Bangkok

Centre for Environment Education (CEE) was established in 1984 as a Centre of Excellence in Environmental Education, supported by the Ministry of Environment and Forests (MoEF), Government of India. CEE today is an internationally reputed organisation engaged in conservation and sustainability education. CEE has been awarded the Indira Gandhi Paryavaran Puraskar for excellence in environmental education and, more recently, the Global Award for Outstanding Service to Environmental Education by the North American Association for Environmental Education (NAAEE).

CEE is hosting the 4th International Conference on Environmental Education (Tbilisi plus 30) during 26-28 November 2007 in Ahmedabad, India. For more details and [call for papers](http://www.tbilisiplus30.org/index.htm), log on to <http://www.tbilisiplus30.org/index.htm>



Guest Article

Managing Urban Sprawl for Achieving Sustainable Urbanisation

H. S. Sudhira & T. V. Ramachandra
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H. S. Sudhira

Understanding Urban Sprawl

Urbanisation in India has never been as rapid as it is in recent times. The number of urban agglomerations and towns in India has increased from 3697 in 1991 to 4369 in 2001, and the process continues. By 2001, there were 35 urban agglomerations/cities having a population of more than one million; the corresponding number was 25 in 1991. Urban population in the country is currently growing at around 2.3 percent per annum. It is projected that the country's urban population would increase from 28.3 percent in 2003 to about 41.4 percent by 2030 (United Nations, 2004). An increased urban population and growth in urban areas is inadvertent with an unpremeditated population growth and migration.

Of the 4000 plus urban agglomerations, about 38 percent reside in just 35 urban areas, thus indicating the magnitude of urbanisation prevailing in the country. This also clearly indicates the magnitude of concentrated growth and urban primacy, which has led to urban sprawl. As one of the fastest growing economies in the world, India faces stiff challenges in managing this urban growth leading to sprawl and in ensuring effective delivery of basic services in these areas.

Urban sprawl is loosely or qualitatively defined as the dispersed development along highways or surrounding the city and into the rural countryside on the fringes of the urban area. A sprawl is generally ascribed to some type of development with implications such as loss of agricultural land, open space and ecologically sensitive habitats. Although the accurate definition of urban sprawl is debated, a general consensus is that it is characterised by an unplanned and uneven pattern of growth, driven by a multitude of processes and leading to inefficient resource utilisation.

Urban areas contribute significantly to the national economy (about 50 to 60 percent of GDP), but face critical challenges in ensuring access to basic services and necessary infrastructure, both social and economic. The overall rise in population of the urban poor or increase in travel times owing to traffic congestion are indicators of the effectiveness of planning and administration in assessing and catering to the demand. Thus the administration at all levels: local bodies, state government and central government, are concerned about this rapid urban growth. It is imperative for the planning and administration mechanism to facilitate, augment and service the requisite infrastructure for urban areas over time systematically. Provision of infrastructure and ensuring delivery of basic services cannot happen overnight and hence planning has to also facilitate in forecasting and provisioning these services with appropriate mechanisms.

Researchers define sprawl as a pattern of land use in an urban agglomeration that exhibits low levels of some combination of eight distinct dimensions: density, continuity, concentration, clustering, centrality, nuclearity, mixed uses and proximity. But ascribing sprawl as a pattern of land use alone would not throw light on the underlying processes, causal mechanisms and hence consequences. In a developing country like India, where population density is high with significant urbanisation rates, urban sprawl obviously cannot be described by pattern alone but more by processes, causes and their consequences. Hence, we (authors) view urban sprawl as the *pattern* of outgrowth emergent during the *process* of urban spatial expansion over time *caused* by certain externalities and a *consequence* of regional planning and administration. The sequence of *patterns*, *processes*, *causes* and *consequences* sets the agenda in this research.

Managing Urban Sprawl

The need for managing urban sprawl arises out of the more global concerns of achieving sustainable urbanisation. Sustainable urbanisation is a dynamic, multi-dimensional process covering environmental as well as social, economic and political-institutional sustainability (UN-Habitat, 2002). Management of urban sprawl entails quantifying the pattern of sprawl; and capturing the processes of urban expansion requires an in-depth analysis of the driving factors that cause them. This requires understanding and visualisation of the consequences of policies, local planning and administration on sprawl. For example, the lack of an effective public transport system with varying work-home distances gives rise to independent motor vehicles and the resultant congestion and spatial expansion. Also, the effect of mobility offered by the transportation networks in relation to the spatial expansion along with other socio-economic and physical processes, the self-organisation of traffic flows in spite of high volumes, etc. are some important questions the operational planning mechanism seeks to answer with the aid of spatial planning support systems (SPSS). Thus, it is imperative to address the management of urban sprawl comprehensively through an integrated SPSS.

In India, as per constitutional provisions, urban local bodies have a mandate for administering, managing and preparing master / development plans. Mostly these plans are static maps with limited forecasting capabilities and there is a dearth of models for the planning process - these lead to ad hoc decisions. Besides, these plans mostly only *demarcate* land use zones and propose little or no effective regulation for the same. Further, with the planning authorities restricting themselves mostly to land uses, there is hardly any coordinated effort to involve or integrate transport, water and sanitation, etc. in the planning process. This results in organisations involved or catering to different services (transport, health, water, energy, etc.) working in isolation while addressing basic amenities. Lack of coordination among the many agencies has led to the unsustainable use of land and other resources and also uncoordinated urban growth.

Various studies on the urban fabric in India also confirm that the lack of effective governance and administration in the local bodies have resulted in an unplanned and uncoordinated urban outgrowth. Urban governance and administration requires keeping track of various processes, activities, services and functions of the urban local body, which is now possible through an information system. In the absence of any such systems, at the basic level, there is a strong and pressing need for an alternative information system to cater to all these. In the next level, it becomes essential to build models based on these information systems, involving simulation and analysis for specific urban contexts. The subsequent level involves the evolution of different strategy and policy options, using these models and information systems. Thus, there are three essential steps to manage urban sprawl and to strengthen the planning and decision making function - information systems, models and policies.

Keeping in line with the framework for planning and decision-making process suggested by Sharifi (2003), a prototype of the SPSS was arrived at with the following four components: Patterns, Processes, Causes and Consequences. This framework is implemented using the tool NetLogo (Wilensky, 1999), an agent-based modelling environment, and was used to develop a prototype planning support system since it offers adequate monitors and plots to visualise patterns, capture processes and model the causes and system dynamics, while evaluating the consequences through simulation. This model was tested for Bangalore, India.

The phenomenon of urban sprawl is potentially observed as a threat to achieving sustainable urbanisation. Hence, it is very essential to understand this phenomenon, especially with the perspective of a developing country. Only then can any policy and management options for effectively addressing the problem of urban sprawl be developed. Thus, in the present context, with the escalating problem of the urban sprawl, there is immense need for an integrated spatial planning support system which can effectively plan, review and evaluate the different policy options while capturing the dynamics involved. Such an SPSS could also be used to regularly monitor and check the nature of sprawl for the compliance of the policy recommendations dynamically over time.

A concluding observation regarding urban sprawl is that the development of a spatial planning support system through research would only be a short-to-medium term solution to this problem. Among the significant drivers for sprawl in developing countries like India is the migration of people from rural to urban areas, aspiring for better livelihood, which is compounding the problem of sprawl. Hence, a long term solution can only be achieved through an overall economic development of the region by way of better employment and livelihood generation activities in the rural areas, so that the migration of people from rural areas to urban areas can be lessened. This would help mitigate urban sprawl besides aiding in the effective planning and administration of urban areas.

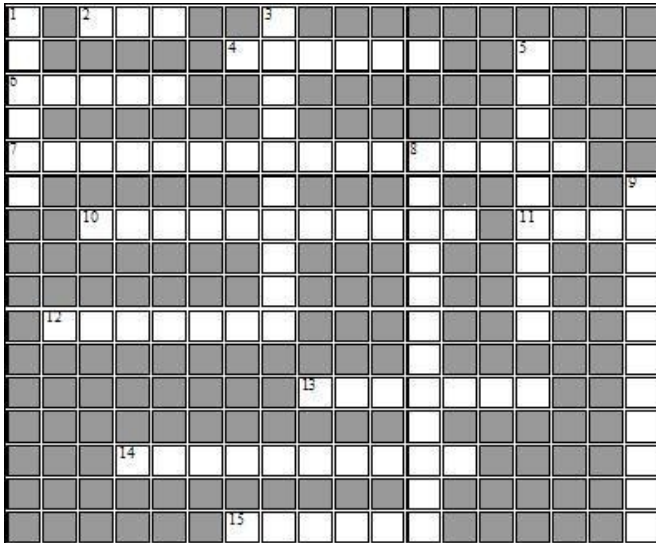
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CROSSWORD



ACROSS

2. The number of countries in the world (3)
4. Enumeration of the entire population of an area and often the compilation of other demographic, social, and economic information pertaining to that population at a specific time (6)
6. Country with the lowest female literacy rate (5)
7. The maximum sustainable size of a resident population in a given ecosystem (8,8)
10. The world's smallest independent state with a population of about 1,000 and a zero birthrate (7,4)
11. The first city to reach a population of 1 million people in 133 B.C (4)
12. Situated in Canada, this is considered the cleanest and the most sanitary city in the world (7)
13. This country situated in Eastern Europe has one of the lowest fertility rates in the world (7)
14. The emigration of a significant proportion of a country's highly skilled, highly educated professional population, usually to other countries offering better economic and social opportunity (5,5)
15. A group of people sharing a common temporal statistical or demographic characteristic (6)

DOWN

1. Country with the highest population density (6)
3. The scientific study of human populations, including their sizes, compositions, distributions, densities, growth, and other characteristics (10)
5. The number of live births per 1,000 population in a given year (5,4)
8. The policy of a government, society, or social group to slow population growth by attempting to limit the number of births (12)
9. A term denoting an urban region/complex consisting of several interconnected cities and suburbs that adjoin each other (11)

(Answers on page 20)

Feature Article

Fluoride Contamination

Poornima K. K

It is estimated that over one billion people across the world have no access to safe drinking water. While providing drinking water is the primary concern, the global focus recently is also on resolving water quality problems, especially in developing countries. One of the reasons for this is the recent findings that around 200 million people, from among 25 nations of the world are suffering from fluorosis, a disease caused by prolonged ingestion of water containing large amounts of fluorides. (Fluorosis can also be caused by inhaling fluoride contaminated industrial gases or dusts, and by accidental ingestion of insecticides containing fluorides.) Among developing countries, India and China are the worst affected by fluorosis.

Fluoride occurs as ions in most ground water. Its content is found to be high in calcium-deficient groundwater in many basement aquifers, such as granite and gneiss, in geothermal waters and in some sedimentary basins. High fluoride content in groundwater is found in many parts of the world including large areas of Africa, China, the Middle East and Southern Asia (India, Sri Lanka). One of the best-known high fluoride belts is the East African Rift from Eritrea to Malawi. The other belt stretches from Turkey through Iraq, Iran, Afghanistan, India, Northern Thailand and China. Similar belts are found in America and Japan too. In India, the weathering of primary rocks and leaching of fluoride-containing minerals in soils yield fluoride-rich groundwater. Over exploitation of groundwater also has a role to play in increasing the fluoride content in groundwater. Other Asia Pacific countries like Cambodia, Mongolia, Myanmar and Viet Nam are also affected by fluorosis.

According to WHO recommendations, the permissible amount of fluoride content should be 1.5 mg/L. Intake of water containing more than 1.5 mg/L of fluoride leads to this disease - fluorosis. Fluorosis is endemic in 22 countries around the world. The major source of fluorosis is through drinking water contaminated with fluoride. In several countries, water is fluoridated since fluorides if present in the right amount (0.7-1mg/L), prevent tooth decay. Another source of fluoride is through consumption of vegetables, fruit, tea and other crops.

News

More Mines in the Philippines

The Philippines Department of Environment and Natural Resources Secretary Angelo Reyes has approved 11 more mineral agreements and exploration permits in different locations throughout the country. These approvals continue the strong trend of the current administration in revitalising and promoting the mining sector, and they come shortly after President Arroyo's visit to Australia which saw her encouraging Australian mining companies to invest in the Philippines.

Stressing that the Philippines is serious in its effort to build up a competitive mining industry, Reyes also announced three more crucial policy reforms that would facilitate the grant of mining contracts. Topping these reforms is the simplification of procedures in the grant of mining permits particularly by reducing the time for posting of mining applications, and streamlining the requirements on the National Commission on Indigenous Peoples (NCIP) clearance and endorsements from local government units.

Source:

<http://www.denr.gov.ph/article/articleview/4364/1/39>

Kinds of Fluorosis

Fluorosis is of three kinds: dental fluorosis, skeletal fluorosis and non-skeletal fluorosis.

Dental fluorosis is reversible whereas skeletal fluorosis is irreversible. Dental fluorosis can be minimised by drinking fluoride-free water. Skeletal fluorosis is a severe stage of fluoride contamination characterised by bent bones, and the affected person has difficulty in bending his/her body properly. The other type of fluorosis is non-skeletal fluorosis in which the person affected suffers from constipation, indigestion, vomiting, and giddiness and experiences pain in several parts of the body. Investigations have demonstrated that soft tissues like skeletal muscles, red blood cells, gastro-intestinal mucosa, ligaments, spermatozoa and thyroid gland are affected in fluorosis patients. Tests in animals also show that high intake of fluoride affects other organs like kidney, liver, adrenal gland and reproductive organs.

Fluorosis is characterised by the following symptoms:

- ✍ Pain in the joints without visible signs of fluid accumulation
- ✍ Non-ulcer dyspepsia characterised by nausea, vomiting, pain in abdomen, constipation followed by diarrhea
- ✍ Muscle weakness, fatigue, anaemia with very low hemoglobin level
- ✍ Polyurea and polydipsia
- ✍ Complaints of repeated abortions/still birth in patients from affected areas
- ✍ Dental fluorosis can be detected through white spots on the teeth, yellowing of teeth, mottling of enamel and, in extreme conditions, even browning of the teeth.

China's experience

WHO has recently found that about 2.7 million people in China suffer from a crippling form of skeletal fluorosis. 65 million people depend on underground water supplies which are heavily contaminated with arsenic or fluoride as per the first national survey of the quality of the country's supply of drinking water. Besides drinking water, inhaling gases from the domestic burning of fluoride rich coal without proper ventilation, is also found to be a cause of fluorosis, resulting in more than 4 lakh premature deaths annually (the number of deaths attributed to urban outdoor pollution is 3 lakh).

News

Times are a-changing in the Arctic

The Arctic spring is coming two weeks ahead of time compared to a decade ago with birds, butterflies, flowers and small animals all appearing earlier in the year as a result of climate change.

A study of a range of animals and plants living in the high Arctic has revealed that many of them are responding to the earlier spring by flowering or laying their eggs significantly ahead of their normal times of the year.

On an average, the breeding and flowering seasons in the Arctic have shifted by 14.5 days but some species of mosquitoes have begun laying their eggs 30 days earlier than in the mid 1990s, said Toke Høye, of the University of Copenhagen in Denmark.

"Our study confirms what many people already think, that the seasons are changing and it is not just one or two warm years but a strong trend seen over a decade," Dr Høye said.

The findings, published in the journal *Current Biology*, show the shift in the spring season has been greater in the Arctic than elsewhere. Previous studies have shown that plants in Europe are flowering 2.5 days earlier than a decade ago, whereas globally animals and plants are appearing 5.1 days earlier each decade.

Source:

http://www.nzherald.co.nz/category/story.cfm?c_id=39&objectid=104466980

Indian Scenario

Fluorosis symptoms were first found in Nellur district of Andhra Pradesh in India in 1927. Now the fluoride contamination is found in 196 districts in 19 states of India, with Rajasthan, Gujarat and Andhra Pradesh being the most severely affected states. It is found that use of black salt in the fast foods in Rajasthan and Gujarat is one of the causes of fluoride contamination. Fluoride contamination in these areas is found to range from 3 mg/L to 8 mg/L.

The fluoride content in water also varies according to seasons, with levels low in winter and high in summer. Around 66.6 million people, including 6 million under-14 children are at risk of acquiring fluorosis in the country, while about six million have already been afflicted.

Techniques to remove fluoride from water

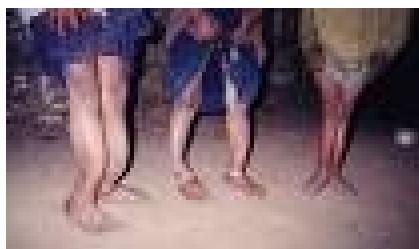
Several techniques and models are being used in India for defluoridation of water. Prominent among these are alternative technologies like using aluminium compounds, bone char, Nalgonda technology (using a mixture of lime and alum), and Prasanti technology (using activated alumina), besides ion exchange process and reverse osmosis. Rainwater harvesting techniques is now being popularised in India as a method for obtaining water without fluoride contamination.

There is still the question of whether these methods are being implemented in the areas affected by fluorosis. Finding a suitable treatment for fluorosis is now a challenge for the researchers in the medical field.

Sources:

<http://www.worldwaterday.org/wvday/2001/thematic/natural.html>

<http://www.icmr.nic.in/000519/updatevol1no2.pdf>



Skeletal fluorosis victims

News

Ha Noi Residents Prepare for Experiment in Recycling

Viet Nam's newest attempt at household recycling kicks off in July in Ha Noi amid hopes that the model will spread across the country. Following six months of planning, residents in the capital's Phan Chu Trinh Ward will start separating their trash into three categories: organic (food), recyclables (paper, glass, plastic, aluminium and steel) and inorganic waste (earth, brick, stone and ceramics) from July 1.

"Waste separation at source turns out to be easy," said Dinh Van Ha, who will take part in the pilot project and has received instructions on recycling. "More than that, it is very good for the environment. I think if each household does it seriously, the city's environment will definitely improve."

The programme is funded by the Japan International Co-operation Agency (JICA). Officials there hope recycling will help Ha Noi cut down on the almost 3,000 tonnes of trash the city generates each day. According to estimates from the municipal Department of Transport and Public Works, only about 20 per cent of the trash is recycled currently.

Officials are also encouraging households to use cloth shopping bags, rather than plastic ones.

Waste separation at source is the first and the most important part of the equation as it's much easier and cheaper than dividing rubbish at landfills, according to JICA expert Hisashi Yamauchi.

Source:

<http://vietnamnews.vnanet.vn/showarticle.php?num=03ENV270607>

Window to the Asia Pacific

Tuvalu

Name: Tuvalu

Location (geographic coordinates): Oceania; this island group is in the South Pacific Ocean, about one-half of the way from Australia to Hawaii. Geographic co-ordinates: 8 30S, 179 12 E.

Capital: Funafuti

Share boundary with: None. Fiji lies to the south, Solomon Islands to the west and Kiribati to the north of Tuvalu. Tuvalu lies to the east of Australia.

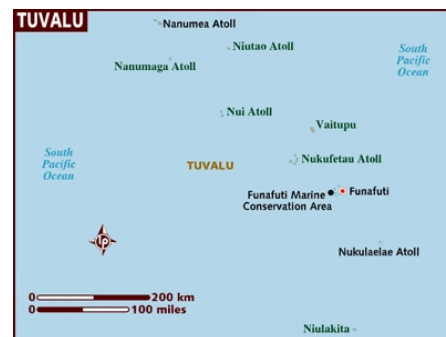
Land area: 26 sq km - this makes it the 4th smallest nation in the world.

Coastline: 24 km. Territorial waters- 750, 000 sq km

Population: 11, 992 (July 2007 est.)

Natural Resources:

Minerals: None



Water: The only source of fresh water is rainwater as there are no streams or rivers and even the groundwater is not potable.

Flora: Most of the indigenous plants to be found in the land are coconut palms and pandanus. The surrounding sea is rich in flora and fauna, but land vegetation is limited to coconut palm, pandanus, and imported fruit trees.

Fauna: Pigs, fowl, and dogs, all of which were imported in the 19th century, flourish on the islands. The only indigenous mammal is the Polynesian rat. Birds include reef herons, terns, and noddies. Tuvalu also has 22 known species of butterfly and moth.

Endemic species: One endemic species of endodontid snail and four endemic species of charopid snail

Endangered species: Green Turtle, Humpback Whale and Hawksbill Sea Turtle

Threatened species: Pygmy Killer Whale/Slender Blackfish (*Feresa attenuata*), Ginko Tooth-beaked Whale (*Mesoplodon ginkgodens*), Bridled Dolphin (*Stenella attenuata*). The mangroves of Tuvalu were listed as a threatened ecosystem by Dahl (1986).

Climate:

Tropical maritime; moderated by easterly trade winds (March to November); westerly gales and heavy rain (November to March); temperature usually within the range of 28°C to 31°C; high humidity and rainfall (up to 3500 mm)

Interesting feature: The highest point on the island is 4.5 metres above sea-level and therefore, because it lies so low, it would be the first country to submerge when sea-levels rise. The island group consists of nine coral atolls.

Places of interest:

- ✍ Tuvalu Women's Handicraft Centre, Funafuti
- ✍ Tuvalu Philatelic Bureau, Funafuti
- ✍ Tuvalu National Library, Funafuti
- ✍ Funafuti Marine Conservation Area, Funafuti

Leading Newspaper: *Sikuleo o Tuvalu* - a government news sheet published in Tuvaluan and *Tuvalu Echoes* run by state-owned Tuvalu Media Corporation. The circulation of these newspapers is around 260.

Environmental Organisations:

Alofa - French-based volunteer organization whose goal is to help save Tuvalu from climate change and other environmental issues, with full participation of the Tuvaluans.

Tuvalu Association of Non-governmental Organisations (TANGO) - a non-profit member organisation that aims to help and support healthy and sustainable development of NGOs in Tuvalu through the provision of training, services and information and through encouraging collaboration and communication between NGOs, government and international agencies.

Tuvalu at SOPAC (South Pacific Applied Geoscience Commission) - an inter-governmental, regional organisation dedicated to providing services to promote sustainable development in the countries it serves.

Current Sustainability Issues:

Climate change is the biggest threat to the island country with the highest point on the land being 4.5 metres above the sea level. It may even get uninhabitable within the next 50 years.

Major environmental problems in the islands include **coastal erosion**, **degradation of fishery resources**, **pollution from the absence of a sewerage system** and **uncontrolled garbage disposal** (ESCAP, 1988)..

Other issues are - **freshwater shortage** since there are no freshwater sources like streams and rivers - rainwater is stored for drinking and other purposes; **beachhead erosion** because of the use of sand for building materials; **excessive clearance of forest** undergrowth for use as fuel; **damage to coral reefs** from the spread of the Crown of Thorns starfish.

International Environmental Agreements:

Tuvalu is party to:

- ✍ United Nations Convention to Combating Desertification (UNCCD)
- ✍ Montreal Protocol on Substances that Deplete the Ozone Layer
- ✍ Agreement with the IAEA for the application of safeguards in connection with the Treaty on the non-proliferation of Nuclear Weapons (with Protocol)

Tuvalu is a group of nine tiny islands in the South Pacific which won independence from the United Kingdom in 1978. Five of the islands are coral atolls, the other four consist of land rising from the sea bed.

Source: http://news.bbc.co.uk/2/hi/asia-pacific/country_profiles/1249549.stm
<http://www.tuvalu islands.com>

Spotlight

Japan for Sustainability

About the organisation

Japan for Sustainability (JFS) is a membership-based non-profit organisation. We share information on developments and activities originating in Japan that lead toward sustainability, with the aim of building momentum toward a sustainable path for the world.

The following are the main activities of JFS.

- ✍ Provides a variety of information on the environment and sustainability, from Japan to the world, via our web site and e-mail magazines.
- ✍ Covers not only current developments but also traditional wisdom, craftsmanship and practices of day-to-day life, as well as local activities.
- ✍ Works to develop special partnerships with people in Asia, in order to cooperate to find paths toward sustainability in this region.
- ✍ Welcomes feedback and comments from overseas and shares them in Japan and with partners in Asia, so that we can improve efforts and activities in this region by learning from each other.
- ✍ Creates a vision for a sustainable Japan through discussion among various stakeholders.

Projects

Kids' "Create Your Future" Website: JFS has launched the Kids' "Create Your Future" Website with an aim to encourage children worldwide to take interest in and gain an understanding of environmental issues, and to think and act independently in response. Through this site, we emphasise the concept of taking a creative approach toward the realisation of a more ecological future on our planet unrestrained by conventional ideas, and we aim to introduce innovative ways of thinking to support concrete methods for sustainable living.

The JFS Indicator Project: JFS has chosen 20 headline indicators for sustainability based on an analysis of over 200 data sets in several sustainability-related categories. This is the first ever numerical evaluation / trial calculation of national sustainability for Japan, undertaken by citizen volunteers through open discussion and study sessions to achieve a more sustainable Japanese society. The results obtained were compared across time periods between 1990 and the present, and vis-a-vis a hypothetical perfect score of 100 projected for 2050 which is based on the model - "Japan in 2050, moving closer towards a sustainable society".

JFS uses Green Power for Its Energy Requirements: The Green Power Certification System is a scheme in Japan that offers a new way for companies and organisations to voluntarily engage in energy conservation and environmental protection. Participants earmark their electricity consumption to be supplied from power produced from renewable energy, and do not have to invest directly in equipment and facilities. In return, they receive a Certificate of Green Power that enables them to embrace the benefits of renewable energy, namely, energy conservation and the reduction of CO2 emissions.

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<http://www.japanfs.org>

News from All Over

China Unveils Climate Change Plan

China has unveiled its first national plan for climate change, saying it is intent on tackling the problem but not at the expense of economic development.

The 62-page report reiterated China's aim to reduce energy use by a fifth before 2010 and increase the amount of renewable energy it produces. But it also repeated Beijing's view that responsibility for climate change rests with rich westernised countries. The report comes ahead of a G8 meeting that will focus on global warming. Germany, which is hosting the meeting of industrialised nations, is calling for a new UN protocol on climate change to replace the Kyoto pact when it expires in 2012.

Source: <http://news.bbc.co.uk/2/hi/asia-pacific/6717671.stmon=content&task=view&id=1781>

Call for Precautionary Approach for Marine Genetic Resources

Several countries called for adopting a precautionary approach to the fragile marine environment as one week of talks on how best to manage and protect the world's marine genetic resources opened at the United Nations in late June. South Africa, Chile and India, among others, also called for a new legal regime for areas beyond national jurisdiction. This new regime, perhaps in the form of an implementing agreement of the Law of the Sea Convention, should guarantee environmental protection, the equitable and effective use of these resources, and the rights and needs of developing countries.

Marine genetic resources are increasingly utilised as the basis for drugs used against a host of diseases.

Source: <http://www.un.org/apps/news/story.asp?NewsID=23037&Cr=Law&Cr1=Sea>

Australian Forests as Good!

Scientists have found that Australia's tropical rainforests are a lot more important in 'cleaning' the earth's environment than anyone previously thought. All trees absorb carbon dioxide from the atmosphere but until now, scientists had thought that the temperate forests found in the northern hemisphere were better at sucking up CO₂ than the tropical rainforests of South-East Asia. It turns out tropical savannas are also good at taking carbon out of the atmosphere.

The research gives new urgency to concerns about heavy logging in places like Indonesia, Malaysia and the Solomon Islands. Asia-Pacific coordinator for the Australian Conservation Foundation, Lee Tan, says it is good to see that forests are back on the agenda.

Source: <http://www.abc.net.au/news/stories/2007/06/22/1958683.htm>

Sustainability in Practice

The One Acre Tree Based Farming System

Priya B

Surshettykoppa and 22 nearby villages, which have benefited from the tree based farming method (TBFM) of BAIF, are situated in Dharwad district, Karnataka State, India. This region is predominated by red loamy soil and receives about 617 mm of annual rainfall. What was once an area where farmers could barely make a living out of land has now evolved into a centre for learning sustainable and innovative agricultural practices.

BAIF (Bharat Agro Industries Foundation) Development Research Foundation, is a not for profit organisation, with a presence in 12 states in the country. Its mission is to create opportunities for gainful self-employment for rural families, ensure sustainable livelihood, enrich the environment, improve the quality of life and instill human values.

The primary aim of BAIF at its Surshettykoppa centre is soil and water conservation through sustainable agriculture, which would also lead to poverty alleviation. Their activities here, started in 1996 with a 7-8 member team and funds from the European Union, now cover 2,488 below poverty line (BPL) families in a cluster of 22 villages. The project was kick-started with an extensive house-to-house survey and its approach was to work with the land, water, vegetation, livestock and human resources in the area.

BAIF introduced a tree component in agriculture in the region which has helped change the socio-economic status of the families, through increase in overall agriculture production, year-round local self-employment, sufficient fuel wood for cooking, fodder for livestock, biomass for composting, and security of drinking water. Livestock (goat and sheep, besides cattle) is integrated with this system. Capacity building and access to credit in the community was achieved through self help groups promoted in the villages. The overall benefits of the project include reduced dependency of the villagers on forest resources, integration of sustainable agricultural practices, decreased out-migration and casual labour work, and soil and water conservation.

✍ The tree based farming concept is implemented on just one acre land. Its salient features are as follows: In each acre of land, besides the regular crop being cultivated, 40 fruit/horticulture trees/plants are also grown. These trees ensure enough moisture and nutrient availability to the land.

✍ Trench-cum-bunds are created across the slope to help to retain soil and moisture *in situ*. The trees are planted in these trenches rather than pits, which promotes better growth.

✍ The field bunds are covered with forestry trees (species include teak, Subabul, *Acacia*, *Glyricidia*, *Dalbergia*, *Cassia*, *Casuarina*, Neem, *Sesbania*) planted at a close spacing of 1 to 2 m in a row. Regular pruning is done to avoid shading and to obtain biomass for mulching and fertilising. The pruned twigs also provide enough fuel wood to meet the requirement of the family. The trees provide a windbreak effect protecting the crops.

✍ Cattle, goat and sheep rearing are integrated in this system, providing additional income through products like milk. An interesting feature of goat rearing in this method is that the goats are tied to the forest trees around the farms, which prevents their grazing in the farm and also helps prune the trees. Poultry is avoided, since they disrupt the vermicompost and feed on the earthworms.

✍ The fields are covered with live fencing with species such as *Cassia siamea*, *Glyricidia*, *Euphorbia*, which provide protection to the plantations, help increase the biodiversity in the area and also produce substantial quantities of biomass for mulching thus increasing the moisture retention capacity and fertility of the soil.

✍ One farm pond (30'x 30'x 10') is a must for every acre as *in situ* moisture conservation technique. The ponds are built as per the *Kalyani* model, wherein more surface area (sides of the pond are cut in a stepped structure) is provided to ensure lateral movement of water and greater infiltration. This helps conserve water throughout the year with the surface enabling rainwater percolation and is used for sip irrigation once the pond gets saturated. .

✍ Pot, drip and sip irrigation techniques are used in the farm. TBFM can sustain drought conditions, since it uses up 80% of the rainfall received, however low.

✍ Biomass produced in the farm is also used to make vermicompost which is applied to the crops. It is also applied directly as mulch, especially for forestry trees.

✍ The farmers have moved from single cropping to multi cropping system, thus increasing their earning capacity and fulfilling their foodgrain and other needs.

✍ The seasonal/multi cropping pattern, the fruit trees, the forestry trees and the livestock together combine to provide year-round income to the farmer, thus obviating the need to migrate to other places for employment during lean periods.

✍ An annual income of Rs. 5,000 to Rs. 10,000 can be obtained from each of these components, thus bringing prosperity to the family.

✍ Self Help Groups (SHG) were formed in the area to actively participate in the planning and implementation of the project, to engender a community feeling and to create the nurseries for the plants and trees required in each village (thus reducing the transport costs of bringing them from distant places).

✍ The villages following this method have become models in sustainable farming and are becoming an inspiration to those who wish to take up the method.

✍ No form of output generated is allowed to be wasted in this system. The output from the trees that form the live fencing is used for various purposes like fuel wood and construction. Fruit trees bring a good and consistent income once they start bearing fruits. The organic wastes from the farm are used for mulching and compost, both of which add to the nutrients in the soil. The livestock is used for both milk and draft purpose; the dung is used in the biogas plant. The slurry from the biogas plant is used as manure. This along with the vermicompost is used in the farm or sold. Each farm also includes a farm house built using material from the far.

Some of the farmers who undertook this method in their farms have now become trainers for other farmers and resource persons for promoting this method in other villages.



Land before implementing TBFM



Land after implementing TBFM

Sustainable Agriculture Model

The implementation of the tree-based farming system leads to a better soil moisture regime, increased organic matter, wind break effect due to live fences, tree plantation leading to better soil moisture retention, increased biomass availability due to integration of livestock into the farming systems, horticultural trees providing sustained incomes, and substantial insurance cover to the farmers against fluctuations in agricultural crop production. Above all, the farmer is now able to stay back on his/her land almost 12 months in a year without seeking outside/seasonal employment, and hence takes better care of the land. All these factors result in increase of agricultural crop production and better income, even within a land of one acre.

This method has been highly successful, both in terms of raising the standard of living and motivating the community. It can be replicated in all soil types except black soil. The community has been actively involved in all sustainable development activities undertaken in this region. The idea has been so successful that when BAIF wanted to withdraw from the project area, the community took over the responsibility of funding the office and retained them.

Source

[Http://www.fao.org/docrep/007/ad511e/ad511e0m.htm#TopOfPage](http://www.fao.org/docrep/007/ad511e/ad511e0m.htm#TopOfPage)

Did you know?

Islands

- ✍ Earth is home to over 100,000 islands. The 150 largest alone have a landmass equal to the size of Europe.
- ✍ The largest island in the world is Greenland.
- ✍ More than 600 million people live on islands. One in every ten people on Earth is an islander.
- ✍ Due to their low elevation levels, islands are particularly susceptible to the ill effects of rising sea levels caused by global warming.
- ✍ Due to their small and isolated ecosystems, islands are ideal venues for scientific studies of Earth's environment. They serve as captive scientific subjects as the effects of habitat destruction and unsustainable development become all the more apparent.
- ✍ According to the recent International Union for the Conservation of Nature (IUCN) Global Species Assessment report, of all recorded species extinctions since 1500 A.D., 62 percent of mammal, 88 percent of bird, 54 percent of amphibian, 86 percent of reptile and 68 percent of mollusk extinctions were island species.
- ✍ The smallest island in the world - according to the Guinness Book of Records - is Bishop Rock in the Atlantic, lying on the south-westerly part of the UK.
- ✍ The remotest uninhabited island is Bouvet Island in the South Atlantic.
- ✍ The remotest inhabited island in the world is Tristan da Cunha in the South Atlantic.
- ✍ The smallest independent island country is the Pacific Island of Nauru.

Red Alert

Japanese Night Heron: Struggling to Survive

Kamalina Sen

Description

This small, stocky heron with stout bill and rufous-brown head and neck is sized 49 cm. It has chestnut brown upper parts and wing-coverts with fine black vermiculations. Belonging to the family Ardeidae, it is known scientifically as *Gorsachius gorsagi*.

Unique feature

Its unique feature is that it is white eared.

Food

The diet of the Japanese Night Heron includes earthworms, crustaceans, fish, and insects and it usually feeds only at night.

Habits

This nocturnal species is so shy and retiring that little is known of their habits. The night heron stands still at the water's edge, and waits to ambush prey, mainly at night. During the day it rests in trees or bushes. It is reported that it ventures out in daytime in cloudy, rainy weather.

Habitat

In its breeding range in Japan, it favours heavily forested areas in hills and on the lower slopes of mountains where there are watercourses and damp areas.

Threats

The main threat is deforestation in both its breeding and non-breeding ranges. The development of dense scrub undergrowth in its range and also the existence of Siberian weasel *Mustela sibirica* is believed to reduce the suitability. It has probably also been hunted in many parts of its range.

Conservation Status

Endangered. Considering its estimated population (i.e.250-999) it is legally protected in Japan and Hong Kong.

Source: http://birdbase.hokkaido-ies.go.jp/rdb/rdb_en/gorsgois.pdf



Interview

Mohammadulla Koshani

Mr. Mohammadulla Koshani is the Training and Liaison Officer, Afghan Conservation Corps (ACC) of the UN Office for Project Services (UNOPS). Stephen Jose from CEE-KSD Kannur interviewed Mr. Koshani to know about the environmental issues and conservation activities undertaken in Afghanistan.

Can you briefly describe your background? How did you come to work for the Afghan Conservation Corps (ACC)?

I have a master's degree in education and was a lecturer in a Teacher Training Institute. But during the communist government, I was fired, after which I joined ILO/UNDP Kabul and worked for 4.5 years to support the disabled persons. I also had a stint with Save the Children/US, International Assistance Mission (IAM) till the end of the Taliban government. I was imprisoned by the Taliban for 45 days. Later I worked with the BBC World Service and then the Adam Smith Institute where I was involved in helping prepare the future social service plan of the new government of Afghanistan. It was my association with Save the Children/US that brought me in contact with UN Office for Project Services (UNOPS), which administers ACC. I joined as Training and Liaison Officer to start the new programme Afghan Conservation Corps (ACC) in June 2003 which was envisaged as a job creation mechanism to find jobs for vulnerable people (widows, internally displaced, returnees, disabled and others). It also aimed at the conservation of the natural resources of the country by establishing nurseries, plantation sites, rehabilitation of public parks, setting up irrigation systems on public and government land as part of capacity building for the respective government departments. The ACC programme is inspired by the American Civilian Conservation Corps, started in the 1930s and still supported by USAID and the US Department of Agriculture.

What are the major environmental and developmental issues that you have found in Afghanistan?

Environmental concerns are still a new phenomenon in Afghanistan. After the collapse of the Taliban and the establishment of the new government, the environment department was established in the country (now called the National Environmental Protection Agency or NEPA). NEPA is setting up offices all over the country and there are many organisations such as ACC, UNEP (United Nations Environment Programme), ADB (Asian Development Bank) and some smaller organisations that are closely working with NEPA to implement conservation activities. I feel that the people and even government departments do understand the value of environmental issues and, for example, want to start plantation and reforestation in their regions. Public awareness programmes are broadcast on Afghan TV (RTV) that encourage people to restore and conserve natural resources.

Can you briefly explain some of your core activities for our readers?

ACC is operating in four zones of the country right now. The activities include setting up of nurseries, employment of labour, rehabilitation of public parks and picnic areas, training of government employees in conservation techniques, and conservation education activities in two sites of ecological significance in Afghanistan.

Personally, I liaise with the government departments, with national and international organisations and the rural community for setting up of conservation projects. I am involved in the selection of project sites and employment of labourers, and also subsequent monitoring of the work. Generally, I organise training workshops for the community and the employees of the forest and NEPA departments on setting up of nurseries, irrigation, soil and water conservation, spring development, seed collection, forest and range management and wildlife conservation. I also work with RTV to create awareness on the importance of environment conservation.

How do you compare the knowledge on environmental issues of the rural with that of the urban community in Afghanistan?

The situation of Afghanistan as a war torn country is very different from other countries. The cities are over populated leading to problems like difficulty in managing the waste. It is very difficult to convince the residents to take care of their environment and municipality does not have the ability to manage the problems, though it is doing its best. In the rural areas the situation is better because the presence of different varieties of trees and grasses clean out the dust. But the education level of the residents is low and so hygiene is a problem.

What methods have you used for awareness creation in the community? What has been the impact of such methods?

The methodology that I am using currently is providing training opportunities for government employees at the city and district level; the training is aimed at creating awareness in the community on natural resources conservation. Our project is also working directly with the community. In Afghanistan, each community has a council called *Shura*, and the head of each local *Shura* is officially involved in the implementation of conservation projects for which on going training will be provided till the end of the project. Currently I am also working with school children with this aim since targeting children is the best way to convey the message to the community.

This method has been effective and people understand the value of conservation: for instance they have realised that the areas that conserve trees and bushes were not affected by flood as opposed to villages that cut trees and convert rangeland into cultivated land where immense damage was caused by floods and erosion by winds. The training of extension workers (government staffs) and their activities in the community is another effective way to create awareness.

How do you incorporate the indigenous and traditional knowledge/practices that can be followed for the protection of environment?

When working with people, listen to their suggestions, ask for their advice, teach them that as human beings we are responsible for the protection of all living beings and showing respect towards them.

Can you describe any major effort undertaken in natural resource management? What was your learning from that experience?

Working with the community and convincing them that all resources are their property and they are the ones who will benefit by their conservation, has enlisted their support in natural resource conservation. If the communities think that the forest belongs to the government, they cut the trees and misuse them. I am also trying to educate the religious leaders (Mullahs) at the community level on these issues. Their speeches are very effective and people are ready to follow their advice. My learning from all these is that working closely with the community/people always yields good results, and involving them in all decision making will ensure project success.

What are the important constraints in the natural resource management activities?

Lack of awareness, poverty, non-availability of suitable publications and media information on these issues, lack of alternatives for fuel wood, lack of security.

What role do the Government and Law play in environment protection in Afghanistan? What kind of laws do you have and how effectively are they enforced?

As mentioned earlier, environment issues are still a new concept in Afghanistan. Afghanistan's first Environment Act was passed by the Parliament in December 2005. The law was proposed and prepared by NEPA as the policy maker and the concerned ministries have been requested to help with the implementation.

What has been your experience in working with the youth on conservation? How important is it to target the youth in this field?

From my experience, I have found that the youth is very enthusiastic and willing to take part in all sorts of conservation activities. They are interested in plantation, irrigation, site preparation, etc. They are proud to realise that the future belongs to them. Their ancestors have left a wonderful earth for them and they are expected to do the same for their future generation.

It is important to target the youth and involve them in conservation issues and activities according to their age and ability levels. I am also working with teachers to train them in involving children in conservation activities.

What is the status of Protected Areas in Afghanistan? What are the endangered fauna and flora in your country? What measures have been taken for their conservation?

Like the other infrastructure, the protected areas in the country have also been affected by the past decades of war very seriously. Animals are hunted for food or fur, trees are cut, the vegetation is used as pasture, and the people are encroaching some parts of the land. The new government, through NEPA and the forest department, is trying very hard to protect the environment from such dangers. ACC is working on protection and environment education at the Band-e-Amir lake (located in Bamyan) and a wetland in Kabul. Some areas require security to gain access, like Ajar Valley in Bamyan (known for its wildlife) and the Wakhan corridors in Pamir (Marco Polo sheep). ADB and Wild life Conservation Society (WCS) have initiated some conservation and education programmes on protected areas and they are working closely with the government. The government has banned the hunting of birds and wild life by a decree. There are also training programmes for government staff on conservation issues.

What activities have been initiated in Afghanistan for the UN Decade of Education for Sustainable Development?

Each UN agency has initiated its own programme: UNICEF and UNESCO are busy on education activities in association with the ministry of education and health. One programme, which is a joint activity, is called (GAIN) Green Afghanistan Initiative. The aim is to create a green Afghanistan by conducting environmental education and taking practical measures in different parts of the country. UNOPS, FAO, WFP, UNEP, NEPA and the Forest Department are working together in this project to help the community by setting up provincial nurseries, training centres and seed stores. ACC and UNEP are also working together on education activities with the respective ministries.



Band-e-Amir lake near Bamyan



Mr. Koshani at a training workshop for extension workers

Career Wise

Course Title: Online Training Course for Certified Environmental Hygienist

Mode: Anytime, Anywhere Distance Learning

Organisation conducting the course:

Ecology College Online,
Phillip Fry Professional Certification Institute
National Highway, Botong
Lumbangan, Mabinay 6207
Oriental Negros, Philippines
<http://www.ecology-college.com/>
<http://www.environmentalhygienist.com/>

Fees: US \$ 499

Mode of payment: Can be paid through Visa, Master, American Express or Discover card using one of the credit card systems included in the website. Alternatively, it can also be paid by personal, business or cashier's cheque or money order in US dollars and mailed to the institute.

Topics covered:

- ✍ Effects of hazardous elements in building materials used for constructing residential and commercial buildings
- ✍ Removal of unhealthy gases, allergens, and other pollution and contamination from buildings
- ✍ Bioterrorism and how to protect a home, apartment, office or commercial building against it
- ✍ How to conduct environmental assessments and tests for certification of Healthy Homes
- ✍ Preparing proposals, plan for environmental remediation
- ✍ Sales, marketing and public relations tips

Nature of Programme: The course can be completed in approximately 60-100 hours of home study at the student's own pace. It provides a complete, state-of-the-art online training and offline resources for in-depth coverage. Students can access their course e-books through a password protected website and unlimited email assistance is provided for course support.

Evaluation: A written test will be emailed to the student once he/she has completed the course and is ready to take the test.

Prospects: The Certified Environmental Hygienist professional certification can be used anywhere in the world, and the holder will be able to investigate a home or building for environmental health risks such as microbiological contamination and provide solutions.

Answers to the Crossword

Across

2. 194 4. Census 6. Niger 7. Carrying capacity 10. Vatican City 11. Rome 12. Calgary 13. Belarus
14. Brain drain 15. cohort

Down

1. Monaco 3. demography 5. birth rate 8. antinatalist 9. Megalopolis

Announcing

Forum for Sharing Sustainability Ideas

Light up the world with CFLs!!!

Lighting is an important element in our lives. While sunlight is available abundantly, it is not enough to light up interiors during the day and of course in the night. Historically, oil lamps were used for lighting, until the incandescent lamp and electricity became easily available. Fluorescent tubes were a great advancement on the incandescent lamps and were widely used to replace incandescent bulbs in homes and offices.

With population increase and development needs, power is in shortage and thus there is a constant search for more energy efficient means of lighting. Compact fluorescent lamps (CFL) has emerged as the answer to this need. CFLs are small fluorescent tubes with attached electronic ballasts. Compared to incandescent lamps, they consume 80% less energy and last 10 times longer. Their quality of light is comparable to incandescent bulbs and they generate much less heat. They are available in various wattages and can replace incandescent bulbs of any wattage.

Dear readers,

*Do remember to post your ideas, comments, suggestions, experiences, and even case studies on the current sustainability issue showcased in the **Forum for Sharing Sustainability Ideas**.*

So, log on to www.knowledgeforsustainability.org!

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Asia Pacific

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