

Mission of the Earth Charter Initiative

“To establish a sound ethical foundation for the emerging global society and to help build a sustainable world based on respect for nature, diversity, universal human rights, economic justice and a culture of peace”

Participants of the Earth Charter Initiative are students and government leaders... local organizations and international agencies ... small towns and global corporations. The Earth Charter is a **'living charter'** with the power to unite people for a common purpose: care and concern for the whole community of life.

Join the Earth Charter Initiative
by using the Earth Charter in your field of activity

Earth Charter for Delhi Schools



Department of Environment,
Government of NCT of Delhi



and
CLEAN-India,
An Initiative of Development Alternatives

Delhi Government - the first Government in India to adopt the Earth Charter principles

Endorse the Earth Charter
And help us to spread its vision of a better future for coming generations

For more information:

Please visit our web sites:
www.EarthCharter.org,
www.environment.delhigovt.nic.in
www.devalt.org
www.cleanindia.in

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prithvi apna ghar



Earth Charter Module-I & II



THE EARTH CHARTER

THE EARTH CHARTER

MODULE - I & II

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FOREWORD

I am happy to note that Development Alternatives has prepared Teacher's Hand Books called "Prithvi-Apna Ghar" to inculcate the principles of the Earth Charter among the students of various schools in Delhi. I have gone through the booklet, and I find that it will enable the students to understand and appreciate the various facets and environmental issues, which are affecting civilization today. The Earth Charter is a document prepared with great deal of attention and its wide spread dissemination is very important to sensitize the youth of today about the principles of Sustainable Development.

In this context, I am happy to note that children will be exposed to four broad categories of issues, which constitute our environment. These are:-

- a) Air, Water and Noise pollution and how to control them effectively.
- b) Different types of Waste Management like Solid Waste, Hazardous Waste, Bio-Medical Waste, Electronic Waste and Construction and Demolition Waste.
- c) The importance of preserving our bio-diversity and understanding the value of trees in our day-to-day existence.
- d) Climate change and its effect on global warming with the likely consequences of melting of glaciers, rising of sea levels, coastal flooding, effects on food grain production and possibilities of epidemics etc.

Ecological integrity today has become an important factor in the development process of any country and I am happy to note that the handbook in a simple and elegant manner will bring out all the issues for discussion, debate and assimilation among the students.



(J.K. Dadoo)
Secretary (E&F)

GREEN DELHI - CLEAN DELHI



SAY NO TO CRACKERS

MESSAGES FROM EARTH CHARTER INTERNATIONAL

City of Delhi, India Adopts Earth Charter Education

On the occasion of Earth Day, the Delhi Government expressed its commitment to the Earth Charter vision and launched a collaborative project with CLEAN-India (Community Led Environment Action Network), a program created by Development Alternatives (a leading Indian NGO and ECI Affiliate) to bring the Earth Charter to over 2,000 Delhi Schools. As part of this effort the Earth Charter, will be integrated into the school curriculum.

Delhi is the first Indian city to embrace the Earth Charter in this formal way, but the Charter is widely known in the country, especially among leaders in sustainability education, and its presence is growing. We look forward to more good news from India in the coming years.

**"Greetings from Earth Charter in Sao Paolo!
What wonderful timing to get this news from you.
CONGRATULATIONS!"**

Alan Atkinson
Executive Director
Earth Charter International

**"CONGRATULATIONS!! WE ARE VERY VERY HAPPY TO HEAR THIS GOOD NEWS!
we are here in Brazil having an Earth Charter meeting and
I just shared your news with many... we greet you and want to
say we will put this in the news..."**

Mirian Vilela
Director
Earth Charter Center for Education for
Sustainable Development at UPEACE
San Jose, Costa Rica

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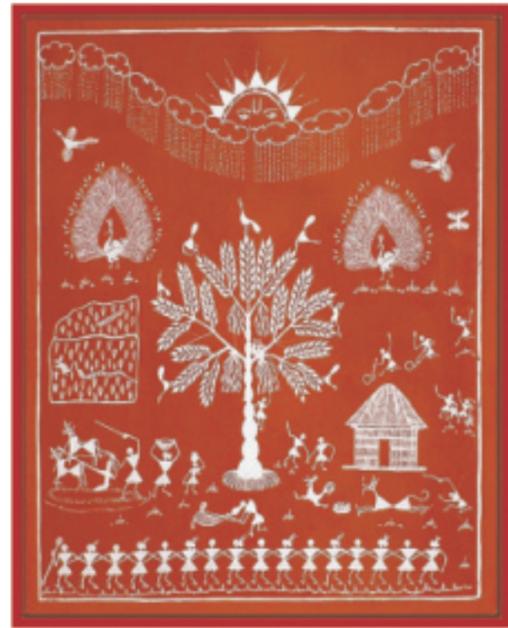
prithvi apna ghar

Module-I & II

**Join together to bring forth a
sustainable global society founded
on respect for nature, universal
human rights, economic justice and
a culture of peace.**



Earth Charter “Prithvi- Apna Ghar” - An Introduction



Dear Teachers

Welcome to “Prithvi- Apna Ghar” -Teachers Hand Books. These have been developed to assist you in introducing the Earth Charter Principles to your students. Based on the principles, issues are presented in an interesting and fun way to stimulate students to take action in their homes, schools, communities and cities and towns.

These are a series of hand books for Teachers, Youth group leaders and other educators to take the stimulating materials and incorporate in their teaching / activities. The main function is to provide ideas, wide range of activities and pedagogical approaches to convey to your students the values and guiding principles underlying “Sustainable Development”

These ideas collected from around the world will give the users inspiration and framework to plan, adapt and use by engaging the students in a process where experience, reflection, cooperation, compassion and respect are encouraged and developed.

The Earth Charter

Earth Charter is a declaration of fundamental principles for building a just, sustainable and peaceful global society in the 21st century, created by the largest global consultation process ever associated with an International declaration. People around the world have come together from different cultures, religions and continents to participate in drafting the Charter. This remarkable document communicates a fundamental unity of people from all walks of life, from every corner of the globe, on



some of the most important issues faced by us. The sixteen core principles reflect a vision for Sustainable Development rooted in “Respect and Care for the Community of Life”.

We can't achieve a healthy environment without achieving social and economic justice and we can't achieve peace without good governance. There is an inextricable connection between all the issues. We need to work on all of them to achieve any of them.

The Earth Charter has been recognized by UNESCO as an important educational instrument for the Decade of Education for Sustainable Development, which started in 2005.

The Earth Charter vision reflects the conviction that caring for people and Caring for Earth are two interdependent dimensions of one task. It challenges us to examine our values, search for common ground in the midst of our diversity and to embrace a new vision that will be shared by people in many nations and cultures throughout the world.

The objectives are to:

1. Establish a sound ethical foundation for the emerging global society and to help build a sustainable world based on respect for:
 - Nature
 - Universal human rights
 - Economic justice
 - A culture of Peace
2. Share with everyone, a certain set of ethical and moral principles which guide the behaviour of people towards the Earth and towards each other to develop a strong sense of responsible citizenship.

It is imperative that children and youth participate actively because it affects their life today and has implications for the Future. In addition to their intellectual contribution and their ability to mobilize support, they bring in unique perspectives.

Earth Charter provides a unique educational framework

- It is the result of a decade long , multicultural, global dialogue
- It helps explain the interconnectedness of economic, social and environmental spheres
- It conveys a sense of universal responsibility
- It articulates the principles for promoting a sustainable future
- It is an educational tool for developing understanding of the critical choices facing humanity

International Concern

The United Nations declared the ten-year period beginning in the year 2005 to be the Decade of Education for Sustainable Development. The Decade represents an international recognition of education as an indispensable element for achieving sustainable development. However, without appropriate teaching resources, this visionary political decision lacks implementation tools. These hand books seek to contribute to the implementation of the Decade- for teachers interested in bringing into the classroom their concerns for building a just and peaceful world. They attempt to respond to the

needs of educators who feel that fundamental changes are needed in our teaching and learning processes.

Teachers Hand Books

The Teachers Hand Books are intended to assist you in incorporating the Earth Charter principles in your teaching as well as in school activities and programmes.

They include:

Materials that you can use to introduce the Charter Principles

Materials and Methodology for motivating the students

Information and data about the present status

Relevant resource materials references

Related web sites

Resource Organisations and Experts

Experience sharing from other countries

This series of hand books deal with:

1. Introduction to the Earth Charter Principles and the overarching principle of Respect and Care for the Community of Life
2. Ecological Integrity
3. Social and Economic Justice
4. Democracy, Nonviolence and Peace

These books represent the approach, methodology and activity guide that will help you plan and implement the programme successfully in your schools thus contributing towards the successful implementation of the Decade's goals of building a more just, equitable and sustainable global society.

Usha Srinivasan

PRINCIPLE 5

PROTECT AND RESTORE THE INTEGRITY OF EARTH'S ECOLOGICAL SYSTEMS, WITH SPECIAL CONCERN FOR BIOLOGICAL DIVERSITY AND THE NATURAL PROCESSES THAT SUSTAIN LIFE.



- a. Adopt at all levels sustainable development plans and regulations that make environmental conservation and rehabilitation integral to all development initiatives.
- b. Establish and safeguard viable nature and biosphere reserves, including wild lands and marine areas, to protect Earth's life support systems, maintain biodiversity, and preserve our natural heritage.
- c. Promote the recovery of endangered species and ecosystems.
- d. Control and eradicate non-native or genetically modified organisms harmful to native species and the environment, and prevent introduction of such harmful organisms.
- e. Manage the use of renewable resources such as water, soil, forest products, and marine life in ways that do not exceed rates of regeneration and that protect the health of ecosystems.
- f. Manage the extraction and use of non-renewable resources such as minerals and fossil fuels in ways that minimize depletion and cause no serious environmental damage.

Objectives:

- To make students understand the impact of urbanization and importance of environmental conservation
- To provide an insight into the growing resource use and significance of efficient utilization of resources

“Earth provides enough to satisfy every man's need, but not every man's greed.”

– Mahatma Gandhi



The Earth is full of natural resources to support life. But population growth, industrial development and unsustainable farming methods are putting an ever-increasing burden on the Earth's natural resources. The last century has seen unprecedented levels of pollution, deforestation, and climate change worldwide. The destruction of the world's natural environment and the subsequent loss of plant and animal species are increasingly serious problems. The 5th principle of the Earth Charter talks about:

Protection and restoration of the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life.

Development and urbanization

Increase in population in urban areas is taking place at a very fast rate. Development of urban areas is conducive for employment creation, poverty reduction, etc. Urbanization requires more resources to support the increasing population. In future if we want to continue with the trend, it is more important to manage and protect natural resources and limit the impact of urbanization on the natural environment.

Do you know?



In India urbanization is progressing faster than the global average. Between 1950 and 2005, the percentage of the world's population living in cities grew 100% and the corresponding figure for India is over 140%. Two out of every five Indians will be living in cities by 2030, i.e., by 2030, 40.76 % of India's population will be living in urban areas compared to about 28.4 % at present.

Read more: <http://ww2.unhabitat.org/istanbul+5/booklet4.pdf>

FIND OUT



Each year, nearly how many people migrate to the four metros of India?

What has been the trend in the last five years?

Plot a graph and discuss with your classmates.

Also find out, what could be the possible problems of growing urbanization.

ACTIVITY : MEASURING URBANIZATION

- Resources/Materials Needed: Art materials; Magazines, Photos of rural areas; A4 Paper; Green and red napkins
- Method Used: Participatory, Lecture

INTRODUCTION

Explain to the children the reasons for migration of people from rural to urban areas, with the help of examples. If data about urbanization in your local area is available, then the exercise with the napkins can be done by using the actual numbers that apply to your region

People move to urban areas for a number of reasons, for example:

- to find work;
- for education (especially tertiary courses);
- to find 'better' living conditions, such as housing, electricity, clean water and sanitation;
- to escape conflict in rural areas;
- to have better access to health facilities;
- to join family members.

Towns are a convenient way of accommodating large numbers of people. But what is the effect of this on the environment?

PROCESS

Familiarize students with the difference between 'urban' and 'rural' environments. Write the two words on the board and explain: rural in the countryside; urban in town. Discuss how the two groups make different demands and have a different impact on their environment.

Set up each student's desk as a family: explain how 60 years ago in India, 80% of families lived in the countryside. Pass out green napkins and place them on 80% of the desks and red napkins on the other 20%.

Then explain that now more than 40% of families live in towns: remove 40% of the green napkins and replace them with red ones.

The classroom is now looking very different so ask the children, what they feel the consequences of this change are?

Explain that 'urbanization' means the concentration of people and activities in the cities of a country.

Finally, ask the students: Why do people want to move into towns? What are the consequences for the environment, for land, air, water and health?

Ask the students how the rural to urban migration impacts on farming communities? What does the rise in urbanization mean for food security? And how does increasing population in cities and towns lead to resource depletion and pollution?

TO CONCLUDE

Ask the students to think about all the positive reasons for staying in the rural areas. They should imagine that they work for an advertising agency and have been recruited by the local authority to produce a brochure or leaflet urging the people to either stay in or move to rural areas. By folding a sheet of A4 paper into three this produces a 6-sided leaflet. What attractive things can the local authority promote in rural areas? Remind the students not to forget to address some of the causes of urbanization in the leaflets.

Outputs: Brochures advertising rural life.

Source: Pachamama Teacher's Guide

Development incorporating environmental conservation

Development without considering the environment and depleting resources is of no use. Such a development leads to the problem of degradation of environment, due to excessive and reckless exploitation and unscientific management of natural resource, and has emerged as a challenge at the global level. Soil, water and air serve as major abiotic environmental sinks for the pesticides, industrial effluents, urban wastes and radioactive wastes. The pollution of these abiotic components, ultimately endangers the very survival of modern civilization. Thus, abatement of environmental degradation and protection of natural resources is an absolute imperative for attaining the goal of sustainable development.

Sustainable development is defined as balancing the fulfillment of human needs with the protection of the natural environment so that these needs can be met not only in the present, but in the indefinite future. Sustainable development is defined as **development that meets the needs of the present without compromising the ability of future generations to meet their own needs.**



Is this glass of water safe to drink? Children find out...

As a part of the nationwide CLEAN-India (Community Led Environment Action Network) Programme on Environmental assessment, awareness, advocacy and action, school children assess drinking water quality using Jal-TARA field testing kit for potability. Based on the cumulative index for the water quality, water is graded as 'Safe for use', 'Check before use' and 'Purify before use'.



S.E.Z. or special economic zones are very contemporary examples of the kind of development that is causing large scale degradation to the environment. S.E.Z. involves taking over large areas of land. The lands on which S.E.Z. are supposed to be set up has traditionally been under multiple use. It could be agro-diverse land, mangrove belts, wetlands and even forests. Each of these ecosystems have a critical role in maintaining the health of the environment. Therefore, when these ecologically important areas metamorphose into industrial belts, ecological functions and human survival are bound to be impacted.

S.E.Z. are also likely to take over large tracts of 'wasteland', otherwise under common use and known to support the resource needs of the most marginalised communities such as the landless. For instance, a S.E.Z. located near Sultanpur National Park is an extremely fragile wetland bird habitat. It acts as a natural drainage for excess water from the surrounding wetlands. Constant digging and construction will upset natural drainage patterns, and the groundwater table will also be impacted due to extraction, thus affecting the agricultural productivity and biodiversity of the surrounding areas.



DISCUSS AND DEBATE.... How can a development activity be made sustainable?

As we have discussed, unplanned development has led to depletion of resources. Even some of our greatest planned development activities have been most destructive as they were not planned wisely. Thus any development activity is bound to be harmful – except when it is centered on human effort and on a small scale. So planning alone will not suffice - it has to have another perspective on development. We will now discuss how development activities also affect the forests and wildlife.

Development vs. Denudation of forests

Development has led to large scale denudation of forests. Human beings and forests have always shared a complex relationship. Forests provide us with an incredible array of natural resources such as timber, wood fibre for paper, and medicinal plants capable of treating almost everything from common cold to cancer.

It is estimated that some 1.6 billion people worldwide depend on forests for their livelihood, with 60 million indigenous people depending on forests for their subsistence.

Forests purify the air we breathe. They preserve watersheds, helping in improving the quality and quantity of freshwater supplies. They stabilize soil, preventing erosion and reducing the risk of landslides.

Moreover, many of the world's most endangered animals depend on forests for their survival. Forests are also home to countless indigenous people, and for many others, havens of tranquility, recreation and inspiration.

DO YOU KNOW:

India alone has 42 Critically Endangered, 92 Endangered and 188 Vulnerable species

FIND OUT:

What is red data book?

Read more:

http://www.iucn.org/themes/ssc/redlist_archive/index_archive.htm

<http://www.iucnredlist.org/>

<http://ces.iisc.ernet.in/hpg/cesmg/indiabio.html>



In a recent study by leading scientists it was found that the present rate of species extinction is 1,000 to 10,000 times greater than it would naturally be.

Considering so much life depends on forests, the fact that forest cover is now a fraction of what it used to be even a few hundred years ago, it stands to reason that there is less space for this diversity of life to live in, and increasingly greater contact with encroaching humans.

Animals that normally live within the boundaries of a shrinking forest are forced to come out and look for food. This often brings them into conflict with humans in settlements that are often situated near forests as these forests provide food, water and other resources.

The best example is the Sunderbans Biosphere Reserve. Sunderbans in West Bengal is the estuarine phase of the Ganges as well as Brahmaputra river systems. This forest is the only tiger habitat of its kind not only in India but also in the world except in Bangladesh. The tidal forms and the mangrove vegetation are responsible for the dynamic ecosystem of the region.



Sundarbans Biosphere Reserve provides characteristic type of habitat suitable for animals inhabiting vast tidal swamp area. The uniqueness of the habitat is said to have contributed to certain behavioural trends, which are characteristic of Sunderbans tigers. Every year several instances are reported of people being killed by tigers, mostly as a

result of the tigers straying from the ever shrinking forest into the ever expanding adjoining human settlements due to the easy availability of prey in the form of cattle, and also as a result of the intrusion of humans into the forest to collect forest produce like honey and timber.

Sundarbans is the home of a number of endangered and globally threatened species. The Indian Tiger and the Fishing Cat are getting effective protection here. The creeks of Sunderbans are the home of

Estuarine Crocodile, Water Monitor Lizard, River Terrapin and Horse Shoe or King Crab. This area serves as the nesting ground for endangered marine turtles like Olive Ridley, Green Turtle and Hawk's Bill Turtles. The endangered aquatic mammals like Gangetic Dolphins thrive within the mangrove creeks close to the sea. Number of heronries establish here during monsoons as well as during winter. It plays host to Trans-Himalayan migratory birds.



WHAT YOU CAN DO: HELP SAVE THE TREES



"Even if I knew that tomorrow the world would go to pieces, I would still plant my apple tree." - Martin Luther King (1929-1968)

Organize a group in your locality. Carry out a programme of tree adoption. Once a week, go for a walk. Plant a tree and then take the responsibility to take care of it and ensure it's healthy growth. You can make the task even more interesting by keeping a record book. Record it's local and scientific name, date of planting, distinct features and weekly growth. You can create a difference. It is your Earth, save it.

FUN TIME : NATURE CAMP

Visit a nearby reserve forest area. Interact with the people living in the peripheral villages. Try to establish links between nature and people, otherwise missing in urban areas.



Forests are important not just to us, but to billions of other species as well. We have to recognize that these plant resources are not just an economic reserve for exploitation, but a whole mosaic of interlocking demand and supply on which all of life depends.

UNDERSTANDING THE CAUSES AND EFFECTS OF DEFORESTATION

- Resources/Materials Needed: Red and blue pens
- Method Used: Group Work, Presentation, Letter Writing

INTRODUCTION

Explain the reasons for deforestation. The current rate of deforestation is about 375 km² a day. This is comparable to the clearance of forests of the size of one football field every second! This activity invites students to search for causes and effects of deforestation. In addition, it encourages the students to become involved in important environmental issues and turn their learning into action.

PROCESS

Divide the class into six groups of students.

Ask the students to underline the causes of deforestation with red, and the effects of deforestation in blue.

One student per group will prepare a short presentation to the whole group about their findings.

Make sure that each presentation starts with the title of the page, poem or case; the main subject of the text as well as the causes and effects found in the text must be included in the talk.

The students can now compare the findings of each group. Are the causes and effects the same in different parts of the world?

Make a list of solutions that can address the problem of deforestation.

Ask the students to write a letter to the government in which they ask for the preservation of forests.

The arguments discussed should be reflected in their letter. The letter can be structured by answering the following questions:

- What causes deforestation?
- Why is deforestation a problem?
- What solutions do you propose?

TO CONCLUDE

Read out the letters in the classroom and have students decide which letter is most persuasive.

Explain to the students that by building up an argument, the person you address in your letter is better able to understand your point of view, why you wrote the letter, and therefore (hopefully) will be more prepared to listen to you.

OUTPUTS

Letters about the issue of deforestation.

With careful management and following proper reforestation practices, the severe adverse consequences resulting from forest loss can easily be abated. It is important to plant native and indigenous varieties, as they establish themselves quickly, and do not have any adverse effect on the environment.

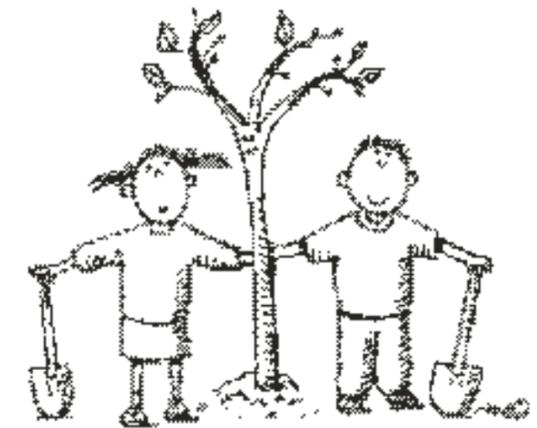
PLANT CAREFULLY

Nowadays a lot of effort is being made to save forests and to do re-plantation. But only planting trees is not the solution. Proper plantation is important, considering the suitability of a tree species to the region. Introduction of a new species, which is non-native to the region, may appear successful for a short duration but in future, it's result could be harmful in one or more ways.

For instance Eucalyptus, a fast growing tree species was introduced in India from Australia. It was thought to be very useful as firewood, pulpwood and for timber. As it has varied adaptability to a wide range of climate and soil, it was found to be suitable for afforestation purpose.

But there are evidences from India and from other parts of the world that Eucalyptus plantations in non-native regions have altered the water resources of the region and are responsible for lowering the water table. It also causes enormous ecological and economic damage to indigenous vegetation and agricultural crops as Eucalyptus produces toxins inhibiting the growth of some local species.

The agricultural practices have also changed over the years. Traditionally they were less resource intensive and required very small inputs, but now agriculture is done in a more commercial manner. Such farming involves large resource inputs (pesticides, fertilizers, etc.), a high level of mechanization and also use of high yielding varieties, which are usually genetically modified or are non-native to the region. This system may appear to be beneficial in the short run but in the long run it has proved to be harmful in one manner or the other.



WATER HYACINTH

Water hyacinth is a troublesome aquatic weed covering water bodies all over the world. It was introduced in India in 1896 as an ornamental pond plant. Now this weed is seen infesting more than 200,000 ha of water surface, causing concern in 98 out of 246 districts in India. This fast multiplying weed can produce 3000 offsprings in 50 days and can double its biomass in 10-12 days.

Find more information on :

The negative and positive impacts of water hyacinth and its negative impact on the ecosystem balance.

NATIVE SPECIES AND THEIR BENEFITS

Native plants are plants that have evolved in a particular region over thousands of years. Therefore, they have adapted to the climate, geography and animal populations of the region.

Native plants save energy and reduce pollution

Native plants do not need fertilizer or irrigation, and they attract beneficial insects which prey upon pests, eliminating the need for pesticides. Native plants reduce air pollution, improve water quality and reduce soil erosion. They improve water quality by filtering contaminated runoff, and reduce soil erosion by stabilizing soils with their deep root systems.

Native plants provide a diverse landscape

Native plants promote biological diversity. Planting a small meadow that once was a lawn, replaces a monoculture with a diverse plant community, increasing the opportunities for beneficial wildlife and insects to live.

Native plants help the animals

As discussed earlier, native plants provide shelter and food to birds, butterflies and other wildlife, promoting biodiversity. In contrast, mowed lawns are of little use to most wildlife. Because many animal habitats today are being lost to urban development, consciously creating or maintaining a habitat full of native plants can be of great help and relief to birds and animals looking for a home.

Native plants can save money

Because native plants are adapted to a certain region, they do not need to be watered as often, nor do they need fertilization, therefore reducing the cost of maintaining a large area of plants.

Thus it is important to control and eradicate non-native or genetically modified organisms harmful to native species and the environment, and prevent introduction of such harmful organisms.



DISCUSS AND DEBATE....

- *Prepare a list of non-native plants and animals species which have been introduced into India taking into consideration some of the positive impacts*
- *Collect information about how it is disturbing the ecological balance.*
- *Compare the positives and the negatives*
- *Discuss with your classmates*

Is introduction of a non-native species really beneficial?

Sustainable use of resources

We have now discussed the importance of safeguarding forests and wildlife. Use of resources in an efficient manner is one of the major issues which is important for any activity and maintaining the ecological balance. We shall now discuss the importance of efficient resource utilization.

Natural resources are often classified into renewable and non-renewable resources. Renewable resources are those, which can restock (renew) themselves if they are not over-harvested. While the non-renewable resources cannot restock themselves. Both the renewable and non-renewable resources cannot be used indefinitely if they are not used sustainably. Once renewable resources are consumed at a rate that exceeds their natural rate of replacement, the standing stock will diminish and eventually run out. The rate of sustainable use of a renewable resource is determined by the replacement rate and amount of standing stock of that particular resource.

A nation's natural resource often determine its wealth and status in the world economic system. In recent years, massive depletion of natural resources, due to various kinds of anthropogenic pressure has occurred.

An example is Coal mining. Coal as we all know is a non-renewable source of energy. Coal mining is the extraction of coal for use as fuel.

The process is causing immense damage to miners as well as the environment. Human and environmental cost of this process is way higher than it's contribution to economic benefits. In recent years, safety of miners who work in subsurface coal mines has been of some concern due to the increase in accident and death rate of the miners. Apart from this it has a huge impact on the environment also.

Environmental impacts and mitigation

Coal mining causes adverse environmental impacts. These include:

1. Release of methane, a dangerous greenhouse gas
2. Interference with groundwater and water table levels
3. Impact of water use on flows of rivers and consequential impact on other land-uses
4. Dust
5. Rendering land unfit for common use of the area
6. In addition, burning of coal, mainly for power generation, is a leading contributor to greenhouse gas emissions, climate change and global warming
7. It is also thought that coal mining is harmful to the quality of air in the surrounding regions. While burning of coal in power plants is most harmful to air quality, the process of mining can release pockets of hazardous gases. These gases may pose a threat to coal miners as well as a source of air pollution

The best example to cite over here is Jharia mines in Jharkhand's Dhanbad district. It produces the best quality coking coal (used in blast furnaces) in India. However, the area, mostly inhabited by tribals, has been smoldering with underground mine fires for several decades now.

Increase in demand for resources are causing concern that the present and future demands of resources for industries and humans cannot be sustained for more than a decade or two. Thus an attempt for efficient resource utilization, increasing the dependency on renewable resources and simultaneously decreasing the dependence on non-renewable resources, can help to combat the issue of resource depletion.



FIND OUT

Have a look at your surroundings, list the resources, categorize into renewable and nonrenewable, and analyze the rate of depletion of resources.

Going Green - Mud Block Buildings



TARA mud block press **Maati Ghar, IGNCNA , New Delhi**

TARA
Technology and Action
for Rural Advancement -
Pioneering Technologies
for Sustainable
Development

TARA mud blocks using locally available resources, are sun baked with zero emissions, have high strength, are thermally insulating- keeping us cool in summers and warm in winters, are cost effective and add aesthetic value with the various hues of the local soil. These blocks are made in a hand or hydraulically operated machine, Balram. Balram is a unique machine that harnesses Compressed Earth Block (CEB) technology for economical, strong and durable earth construction. This technology also allows the use of fly ash and stone dust for production of compressed blocks. The Maati Ghar at Indira Gandhi National Centre for Arts in New Delhi has been built by TARA, Development Alternatives, using Balram bricks.

Recycle paper. For every ton -

- Save 17 trees , Save 27,000 litres of water,
- Save 4000 KW of power,
- Reduce waste , Reduce pollution

In India, Delhi school children have led the way...



Using waste paper recycling plants, children are converting waste paper generated in their schools into paper, certificates, greeting cards and bags and have set an example for the Government to follow.

Waste paper from all the Delhi Government offices is recycled by the recycling plant at the Delhi Secretariat and converted into files and stationery, thus saving 40,000 trees every year!



World GDP - Value of Ecological Services

Development is essential as it increases the Gross Domestic Product (GDP). Whereas the GDP of a country indicates its economic performance, i.e., the sum of all assets of a nation, this does not account for future obligations such as environmental degradation, and also does not measure the sustainability of growth. It has been calculated that the GDP of the world is 20 trillion dollars which is comparatively very less to the value of ecological services provided as 33 trillion dollars.

As the Gross Domestic Product (GDP) reflects only a small part of reality as economy and does not address the quality of life as happiness and well being, nations such as Bhutan have advocated Gross National Happiness as against Gross Domestic Product. Gross National Happiness defines prosperity in more holistic terms and attempts to measure actual well being rather than resource consumption and asset creation.

It is widely felt that the present development strategies can neither Eradicate Poverty nor Strengthen Ecological Security. The need of the hour is Sustainable Development to meet basic needs of all and to maintain the resource base.

PRINCIPLE 6

PREVENT HARM AS THE BEST METHOD OF ENVIRONMENTAL PROTECTION AND, WHEN KNOWLEDGE IS LIMITED, APPLY A PRECAUTIONARY APPROACH.



- Take action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive.
- Place the burden of proof on those who argue that a proposed activity will not cause significant harm, and make the responsible parties liable for environmental harm.
- Ensure that decision making addresses the cumulative, long-term, indirect, long distance, and global consequences of human activities.
- Prevent pollution of any part of the environment and allow no build-up of radioactive, toxic, or other hazardous substances.
- Avoid military activities damaging to the environment.

Objectives:

- To sensitize the children towards irreversible environmental harm even when scientific knowledge is incomplete or inconclusive
- To recognize the importance of including the consequences of human activities in the long-term, while decision making

“Intellectuals solve problems; geniuses prevent them.”

- Albert Einstein

These words of Einstein are correct for all aspects of life. We all know the phrase 'Prevention is better than cure'. It's better to avoid the circumstances that can cause problems, instead of first indulging in trouble and then finding ways to reverse the harm done. And this principle applies to the environment as well. Things are the best when they are in their natural state. But if the need of the hour says that certain changes are necessary, then we should make them very carefully, because once harm is done, it is very difficult to reverse it. And this is exactly what the 6th principle of the Earth Charter says:

Prevent harm as the best method of environmental protection and, when knowledge is limited, apply a precautionary approach.

Prevention: the best policy

The trend towards growing urbanization and industrialization not only results in substantial consumption of resources but also generates huge amount of waste. As a result the resilience and carrying capacity of the environment is decreasing.

Carrying capacity is defined as the number of individuals who can be supported in a given area within natural resource limits, and without degrading the natural, social, cultural and economic environment for present and future generations.

Resilience is the ability of a system to recover from disturbance, which in turn is closely related to degradation of natural resources.

One of the ways to counteract the above said problem is to prevent harm to the environment. This can be done by reducing the dependency on non-renewable resources, increasing the use of indigenous and renewable tools, avoiding the use of technologies whose long term impacts are not known. In this context, precautionary approach becomes a compass to guide decisions under uncertainty, rather than a hammer to force a specific action when a pre-specified level of evidence has been met. It encourages changes to the research agenda to support examination of broader hypotheses, expanded characterization of uncertainties, and the study of cumulative and interactive effects. Thus precautionary measures help in:

- Upholding the basic right of each individual (and future generations) to a healthy, life-sustaining environment;
- Action on early warnings, when there is credible evidence that harm is occurring or likely to occur, even if the exact nature and magnitude of the harm are not fully understood;
- Identification, evaluation, and implementation of the safest feasible approaches to meeting social needs;
- Placing responsibility on originators of potentially dangerous activities to thoroughly study and minimize risks, and to evaluate and choose the safest alternatives to meet a particular need, with independent review; and
- Application of transparent and inclusive decision making processes that increase the participation of all stakeholders and communities, particularly those potentially affected by a policy choice.



DISCUSS AND DEBATE

People still continue to suffer from the after effects of Hiroshima and Nagasaki bomb-blasts. Discuss the nature of these effects on the people and environment.

Debate on the topic: Economic development and preservation of environment can be attained simultaneously.

Precautionary approach

When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. Many recent environmental crises have arisen from the failure to act quickly to avoid unintended consequences of seemingly beneficial technologies, and precaution is seen as a way to avoid these mistakes in future decisions. There are numerous examples of various chemicals and technologies, which when invented were thought to be very useful, but subsequently as time passed they proved to cause havoc. One such example is Chlorofluorocarbons.

DO YOU KNOW

CFCs or chlorofluorocarbons, are leading to the depletion of the ozone layer, the protective layer that shields us from the harmful ultraviolet rays of the sun. If this layer keeps thinning at this rate, living beings will not be able to survive on Earth.

We are all culprits when it comes to damaging the ozone layer. Thus it is our duty to save it also. CFCs are commonly found in refrigerators and air conditioners. We should avoid the use of Ozone Depleting Compounds (ODCs) and CFCs as far as possible. The lesser they are used and released into the atmosphere, the more protected we are. Thus we should prevent using them before they damage us, because the outcome will be irreversible.

Know more: http://ozone.unep.org/slideshow/pages/ozone-cartoons_11_0001_jpg.htm



KNOW MORE:

What is DDT?
What are its negative impacts?

FIND OUT:

Make a list of things that contain CFCs and are commonly used by us.
Suggest a few ways in which you can help to protect the ozone layer.

COMPARE AND CONTRAST:

In countries like U.S.A. and many European countries stringent laws are followed to avoid the use of things that contain ODCs and CFCs. Compare these laws and their implementation with the situation in India. What steps has India taken to curb the use of such products and how effective their implementation is.

PRECAUTIONS AND INNOVATION

Precaution can be a tool to redirect innovation towards safer and cleaner practices to meet human needs. The precautionary approach provides guidance in these contested policy dilemmas, encouraging utilization of the evidence as a whole, including: the strength of the evidence of risk, uncertainty and ignorance about the risk, its potential magnitude, and the availability of feasible alternatives to the proposed technology.

For instance, promoters of genetically modified food, claim that the precautionary approach would block development and use of the technology on the basis of a hypothetical risk, with negative consequences for feeding the hungry in less-developed countries. A precautionary approach to regulation of this potentially powerful technology would begin by clarifying its intended purposes. Is the purpose of genetic modification of food to increase food production, to support a more ecologically sustainable form of agriculture, or to create business opportunities?

Once the purpose is identified, innovation of alternative methods of achieving this purpose should be identified, and weighed against the genetic technology, both in terms of efficacy and potential risks. This alternatives analysis should be very broad, examining a wide range of food production strategies, and including the full range of interested parties.



CASE STUDY

Bt cotton in India is the best example to explain the adverse effect which genetically modified crops can have not just on the environment but also on the people. In 2002, India allowed farmers to cultivate Bt cotton, the only Genetically Modified crop commercially grown in India. The GM variety is genetically modified to contain the Bt toxin, which makes it bollworm resistant, resulting in a decrease in the use of insecticides and thereby improves the yield. The technology was much welcomed by the Indian farmers and was used in nine states of India, of which Gujarat, Maharashtra, Andhra Pradesh and Madhya Pradesh had the major share.



Very soon the negative impacts of the crop which were not known at the time of introduction of crop variety became evident. A weak regulatory system to monitor where and how the cotton is grown, also mushrooming of illegal market for fake seeds meant that thousands of illegal Bt cotton seeds were sold in markets. This created a big obstruction for the regulators to monitoring Bt cotton plantations. The genetically modified crops were exposed to the non-target pest species to which it was not resistant. Also there were cases where the targeted pest population, when exposed continuously for several years developed resistance to Bt toxin through mutation and natural selection.

After an initial success, some areas showed repeated failure of cotton crops. Farmers of Maharashtra's Vidarbha district committed suicide due to crop failure. In 2003, cotton farmers in the southern state of Andhra Pradesh, suffered severe agricultural and financial losses and many farmers including their entire families committed suicide.

ACTIVITY:

- Make a list of widely found and grown genetically modified crops in India.
- After making a list of such plants, also research on the adverse effect they have on the environment, and people in general. Discuss their harmful nature.
- Then talk about the ways in which their massive use can be eradicated.



After completing the project, you can also have a presentation so that it can be discussed on a bigger platform where all students can actively participate in it, interact and can give their valuable inputs. This will help create awareness among them and also make them conscious individuals.

PRECAUTION AND FORESIGHT

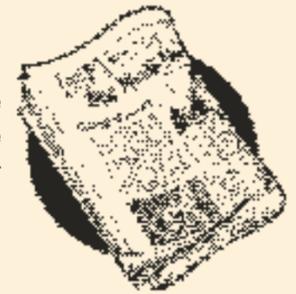
The concept of 'foresight', inherent in the precautionary approach, involves the establishment of long-term goals for protection of environmental degradation. Precaution also encourages a broader view of how technologies impact society, environment and economy. When a decision is taken based on limited knowledge about a hazard it may ultimately turn out to cause havoc. Thus, undertaking a precautionary approach while planning the activity helps to understand the broad perspective and foresee the possible long term risks and benefits and undertaking possible ameliorative measures.

Environmental Impact Assessment (EIA) may be defined as a formal process used to predict the environmental consequences of any development project. As a planning tool it has both information gathering and decision making components which provides the decision maker with an objective basis for granting or denying approval for a proposed development. EIA thus ensures that the potential problems are foreseen and addressed at an early stage in the project's planning and design.

TO DO:

Now that you have a concrete idea as to what EIA is; find out what are the drawbacks in Indian working system that we are not able to receive its full benefits. You can compare the work done in our country to other countries.

Collect newspaper articles which carry EIA reports on any developmental activity.



We have now discussed why precautions are so essential and how by taking certain steps we can protect ourselves and the environment from a lot of hazards. We have also discussed cases where such precautions were not taken and how everyone had to suffer because of the mistakes committed. After discussing all these things in detail, we shall now talk about the menace that in modern times is causing most harm to the environment and health of individuals in the society. Also if remediative measures are not taken to prevent this menace, it can lead to the doom of whole mankind. The name of this menace is **Pollution**.



"There is so much pollution in the air now that if it weren't for lungs there'd be no place to put it all."

-Robert Orben.

WHAT IS POLLUTION?

Pollution is the introduction of substances or energy into the environment, resulting in deleterious effects of such a nature as to endanger human health, harm bioresources and ecosystems, and impair or interfere with amenities and other legitimate uses of the environment.

HARMFUL EFFECTS OF POLLUTION

Effects on human health

Adverse air quality can kill many organisms including humans. Ozone pollution can cause respiratory disease, cardiovascular disease, throat inflammation, chest pain, and congestion. Water pollution causes approximately 14,000 deaths per day, mostly due to contamination of drinking water by untreated sewage in developing countries. Oil spills can cause skin irritations and rashes. Noise pollution induces hearing loss, high blood pressure, stress, and sleep disturbance.

Effect on ecosystems

Sulphur dioxide and oxides of nitrogen can cause acid rain which reduces the pH of soil. Soil can become infertile and unsuitable for plants. This will affect other organisms in the food web. Smog and haze can reduce the amount of sunlight received by plants to carry out photosynthesis. Invasive species can outcompete native species and reduce biodiversity. Invasive plants can contribute debris and biomolecules (allelopathy) that can alter soil and chemical compositions of the environment, often reducing native species' competitiveness.

ACTIVITY:

Make a project on various kind of pollutants prevalent, their sources, how they affect the environment and measures to curb them.

Start a club in which you will go for eco-friendly walks or cycling trips and make efforts to curb pollution.

Invite an environmentalist as guest speaker to come and speak to them about the harmful effects of pollution.



The cost of one nuclear weapon test alone could finance the installation of eighty thousand hand pumps, giving third world villages access to clean water.

You must have seen (and smelled) the smoke coming out of an old car's tailpipe? Those are partially burnt hydrocarbons. This is the fuel that does not totally burn up when you drive a petrol powered car.



Now that we have got enough insight into the preventive measures that should be taken to curb the harm done to the environment and also about the menace that can destroy the environment, we shall now talk about the instruments provided by our constitution to fight for our cause if we feel that our environment is being subjected to some harm.

Public interest Litigation, in simple words, means, litigation filed in a court of law, for the protection of Public Interest on issues such as pollution, terrorism, road safety, constructional hazards, etc. A Public Interest Litigation can be filed only in a case where Public Interest at large is affected. A single person being affected by state inaction is not a ground for filing a PIL.

PIL can be filed in certain cases when damage is being caused to the environment:

- Where a factory / industrial unit is causing air pollution, and people nearby are getting affected.
- Where, in an area / street there are no street lights, causing inconvenience to commuters
- Where some banquet hall plays loud music at night causing noise pollution.
- Where some construction company is cutting down trees, causing environmental pollution.

THINGS TO DO:

Research and find out the policies made by the government in the recent past that have had considerable impact on the people and the environment.

Make a project on how renewable resources can be used for manifold purposes instead of the popular non-renewable resources that cause so much harm to the environment.



CASE STUDIES:



In the area of environmental protection, PIL has proved to be an effective tool. In **Rural Litigation & Entitlement Kendra vs. State of U.P.** (1) the Supreme Court prohibited continuance of mining operations terming it to be adversely affecting the environment.

In another case **M.C. Mehta vs. Union of India** (3) the Supreme Court held that air pollution in Delhi caused by vehicular emissions violates right to life under Art. 21 & directed all commercial vehicles operating in Delhi to switch to CNG fuel mode for safeguarding the health of the people.

In a landmark case **Vellore Citizens' Welfare Forum vs. Union of India** (5) the Supreme Court allowed standing to a public spirited social organization for protecting the health of residents of Vellore. In this case the tanneries situated around river Palar in Vellore (T.N.) were found discharging toxic chemicals in the river, thereby jeopardizing the health of the residents. The Court asked the tanneries to close their business.

ACTIVITIES:

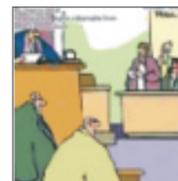
- Prepare a short skit, where you can show that in your neighbourhood widespread tree cutting is taking place at a construction site. You feel this is not an environment friendly act and thus decide to take a stand against it. Under PIL, you file a case against the company that is building the site.

- In the skit you can show how the citizen files the case, and how he places his case before the court. This will introduce the students to PIL, and will also help them realize that they can fight for their rights in court.



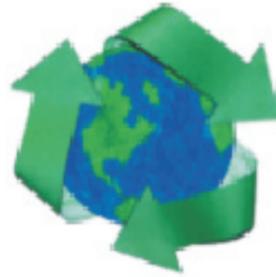
Find out more cases where Indian judiciary adopted the technique of public interest litigation for the cause of environmental protection.

Do you read the newspaper? Cut newspaper clippings which contain articles on similar cases and make a collage of them. Become a responsible citizen. Know more about your environment so that you can also take steps to prevent the harm being done to it.



PRINCIPLE 7

ADOPT PATTERNS OF PRODUCTION, CONSUMPTION, AND REPRODUCTION THAT SAFEGUARD EARTH'S REGENERATIVE CAPACITIES, HUMAN RIGHTS, AND COMMUNITY WELL-BEING



- Reduce, reuse, and recycle the materials used in production and consumption systems, and ensure that residual waste can be assimilated by ecological systems.*
- Act with restraint and efficiency when using energy, and rely increasingly on renewable energy sources such as solar and wind.*
- Promote the development, adoption, and equitable transfer of environmentally sound technologies.*
- Internalize the full environmental and social costs of goods and services in the selling price, and enable consumers to identify products that meet the highest social and environmental standards.*
- Ensure universal access to health care that fosters reproductive health and responsible reproduction.*
- Adopt lifestyles that emphasize the quality of life and material sufficiency in a finite world.*

Objectives:

- To explain the 3R principle; reduce, reuse and recycle.
- Discussion on energy conservation and how we can minimize our reliability on energy devices and use energy efficiently.
- Calculating the actual cost of any product: ecological foot print.
- Power with the people to consume in a sustainable manner: power to become a Green Consumer.

"If future generations are to remember us with gratitude rather than contempt, we must leave them something more than the miracles of our technology. We must leave them a glimpse of the world as it was in the beginning, not just after we got through with it."

- Lyndon B. Johnson

These words of President Lyndon Johnson remind us of the fact that only our sustenance on Earth is not vital. We have to leave behind a planet that will be befitting for our children and all the other living things to reside. We have to leave for them a place to live in, not a living hell. Thus it is essential on our part that each one of us take important steps to keep the environment clean, and ensure a clean and sustainable Earth. To achieve this, we have to adopt certain life patterns that can safeguard our planet Earth. And this is what we shall discuss in the 7th principle of the charter:

Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being.

3R Principle:

The 3R principle basically emphasizes upon waste minimization. Population increase and high consumption of products in the developed world has created a global waste problem. This has led to increasing relevance of the principle. It aims at reducing the amount used, reusing it and then recycling it.

Reduction

Reduction of waste at its source is crucial to any waste minimization strategy. Examples of this include redesigning product packaging to use less material, modernizing outdated and inefficient equipment to use materials more productively and replacing disposable products with durable alternatives. Also, changing to a simple lifestyle means less clutter, fewer things to wear and not buying till we need something badly. Reducing waste also means saving resources.

Reuse

Reuse of a product more than once in its original form is the second level in the waste management hierarchy after source reduction. Reuse differs from recycling because products and materials are not reprocessed, saving resources and energy. It should also denote using, as long as possible, not discarding something because it is a little old, a little dull or not in fashion any more.

Recycling

The most common materials used in recycling are wood fibre, metals, glass and plastics. In most cases, manufacturing from recycled materials requires less energy and results in a reduced environmental impact when compared with using a virgin or primary resource, provided the recycled materials are collected and processed efficiently.

Why recycle?

Recycling has environmental, economic and social advantages.

- Recycling generates civic pride and environmental awareness.
- Recycling helps prevent environmental pollution.
- Recycling saves natural resources.
- Recycling conserves raw materials used in industry.
- Making products from recycled ingredients often uses much less energy than producing the same product from virgin materials.
- Recycling reduces the amount of material dumped in landfill sites and helps our waste disposal problems.
- Goods are used productively and prevented from becoming litter and garbage.

EVEN YOU CAN PLAY A MAJOR ROLE BY REDUCING, REUSING AND RECYCLING THE PRODUCTS:

- ⇒ Become informed about the environmental impacts of the products you buy. If you're not satisfied, search for better alternatives.
- ⇒ Bulk buy when possible, but don't buy more than you can use.
- ⇒ Choose products with less packaging.
- ⇒ Choose products with recyclable or reusable packaging.
- ⇒ Carry reusable shopping bags or boxes.
- ⇒ Say 'NO' to unnecessary plastic bags and other packaging.



- ⇒ Reuse plastic bags and all types of containers over and over.
- ⇒ Buy quality goods that will last.
- ⇒ Encourage manufacturers to play their part.
- ⇒ Buy recycled goods.
- ⇒ Reduce energy and water use.
- ⇒ Donate unwanted clothing, furniture and goods to charities
- ⇒ Hold a garage sale.
- ⇒ Use rechargeable batteries rather than single-use batteries and ask your local council about how to dispose off batteries properly.
- ⇒ Carry your lunch in a reusable container rather than disposable wrappings.
- ⇒ Reuse envelopes and use both sides of paper.

ACTIVITY:

Now that we have enumerated various step as to how to reduce, reuse and recycle products so that waste is minimized and we safeguard the Earth's regenerative capacities; let us try some activities.

Every week, make products from waste materials in one of your free classes. You can use materials like pencil shaving, waste paper, old newspaper thermocol pieces etc. You can put up an exhibition and sell these products. You can do this in your locality or in your school. This will send out a very important message and you will also save money.

Make a booklet or an informative book listing the products that generate wastes that are potentially harmful to the environment and also ways in which such waste should be disposed off.

You can also publicize issues through a newsletter or your school magazine.



WHAT CAN YOU DO AT SCHOOL TO IMPLEMENT THE PROCESS?

At school, you can:

- Educate children to be responsible consumers and recyclers.
- Promote litter control.
- Educate parents and teachers, about the present waste scenario, and its effects.
- Support or initiate school recycling schemes.



ENERGY CONSERVATION:

"I have no doubt that we will be successful in harnessing the sun's energy. If sunbeams were weapons of war, we would have had solar energy centuries ago."

-Sir George Porter.



Energy conservation is another area in which we need to take immediate action. Because of inefficient use of energy resources and also due to more consumption than production, India is suffering from a major energy crisis. We most often use **non-renewable** source of energy. As the name suggests, it is an energy source that we are using up and cannot recreate in a short period of time. Examples of non-renewable sources of energy are fossil fuels - **oil, natural gas, and coal**. We use all these energy

sources to generate the electricity we need for our homes, businesses, schools, and factories. Electricity energizes our computers, lights, refrigerators, washing machines, and air conditioners, to name only a few uses.

It has been seen in the past century that the consumption of non-renewable sources of energy has caused more environmental damage than any other human activity. Electricity generation from fossil fuels such as coal and crude oil has led to high concentrations of harmful gases in the atmosphere. This has in turn led to many problems being faced today such as ozone depletion and global warming. Vehicular pollution has also been a major problem.

Therefore, alternative sources of energy have become very important and relevant to today's world. These sources, such as the **sun** and **wind**, can never be exhausted and therefore are called **renewable**. They cause fewer emissions and are available locally. Their use can, to a large extent, reduce chemical, radioactive, and thermal pollution. They stand out as a viable source of clean and limitless energy. These are also known as non-conventional sources of energy. Most of the renewable sources of energy are fairly non-polluting and considered clean though biomass, a renewable source, is a major polluter indoors.

A very good example to explain the above description are energy efficient houses in Nepal. Nepal has tropical daytime temperatures but cold nights with temperatures close to freezing. The energy efficient houses are made in such a way that the houses can trap heat during the day which is utilized for cold nights. These buildings have special type of walls called Trombe wall. The Trombe walls of the houses are made from compacted earth or sun-dried clay bricks, with a plastic or glass panel outside. The wall's thickness must be such that the interiors benefit from delayed heat radiation. A wall has two air gaps, one at the top and one at the bottom to speed up the circulation of heat from outside into the interior.

SMALL INITIATIVES

Now that you know how vital energy is for us, take some remediative steps. Save electricity as much as possible. Whenever you don't want the light or fan, ensure you switch it off. Be careful for the whole month and then observe the difference in the units consumed at the end of the month to the units consumed last month.

Make a list of renewable and non-renewable sources of energy. Compare and contrast the implications of the use of each.

Visit some construction site and make a list of non-renewable energy sources being used.

DID YOU KNOW?

- Leonardo Da Vinci predicted solar industrialization as far back as 1447.
- In one hour more sunlight falls on the Earth than what is used by the entire population in one year.
- About 2 billion people in the world currently do not have access to electricity.
- Electric ovens consume the largest amount of electricity, followed by microwaves and central air conditioning.
- Shell Oil predicts that 50% of the world's energy will come from renewable sources by 2040.
- Accounting for only 5 percent of the world's population, Americans consume 26 percent of the world's energy.



THE FILM INDUSTRY: SOME STATISTICS

It is estimated that 28 tankers or **28,000 liters** of water are usually needed for a single rain sequence. A full fledged scene like that of Hrithik Roshan and Preity Zinta's 'Idhar Chala Main' in 'Koi Mil Gaya' or Kareena's 'Bhaage Re Mann' in 'Chameli' used enough water to meet the requirement of **30 families for four weeks**. Mostly the water is highly purified as the actors fear rashes and other skin infections.

Water is not the only resource that is used in excess. Indoor shoots need substantial power too. Studio management allocates 50KW-70KW for the shoot. However this is just half of the energy requirement. Generator vans are dispatched to the scenes which guzzle 18 liters of diesel every hour. A single scene which lasts less than a minute uses more than 120 KW. A household which uses three tube lights and three fans for six hours will use half that much energy for a whole month.

If this is the state with small budget Bollywood films, then imagine how much Hollywood films must be spending with their comparatively massive budgets ???

ECOLOGICAL FOOTPRINT:

In order to live, we consume what nature offers. Every action impacts the planet's ecosystems. This is of little concern as long as human use of resources does not exceed what the Earth can renew. But are we taking more? To answer this question, a tool called ecological footprint was devised.

The Ecological Footprint is a resource management tool that measures how much land area and water a human population requires to produce the resources it consumes and to absorb its wastes under prevailing technology. By measuring the Ecological Footprint of a population (an individual, a city, a nation, or all of humanity) we can assess our overshoot, which helps us manage our ecological assets more carefully. Ecological Footprints enable people to make personal and collective choices in support of a world where humanity lives within the means of one planet.

Today, humanity's Ecological Footprint is over 23% larger than what the planet can regenerate. In other words, it now takes more than one year and two months for the Earth to regenerate what we use in a single year. We maintain this overshoot by liquidating the planet's ecological resources. This is a vastly underestimated threat and one that is not adequately addressed.

ACTIVITY: WHAT DOES IT TAKE TO MANUFACTURE YOUR SHOE?

Objective: To makes students aware that the products they buy have an impact on the environment beyond that of disposal of the packaging or other wastes generated from use.

Materials needed: shoes, paper, and pencil

Introduction

Introduce the concept that all production processes generate some types of waste. Ask everyone to wear a pair of tennis shoes to class the following day.

Process

STEP 1: Have each student take off a shoe and put it on the desk in front of them.

The student should make an attempt to draw their shoe. Ask them to examine it closely and list all the different types of materials (to their best guess) that the shoe is made of and label these parts on their drawing. This list will probably include such items as leather, nylon, canvas, plastic, rubber, cotton, etc. Add to the list the packaging materials (this could include cardboard shoe boxes, tissue paper, plastic bags, paper bags, etc.).

STEP 2: Start a discussion by asking the students where their shoe came from. While the obvious answer will be 'the store', expand their understanding to include the various components they just



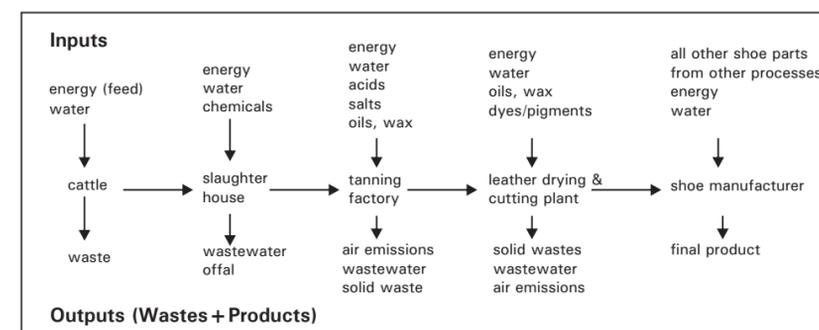
listed. For example, the leather came from a factory that processes and cuts leather which is then delivered to the shoe manufacturer. Tracing the origin of the raw materials further back, the leather comes from cattle via a slaughterhouse and tanning factory. You may want to develop a type of flow chart similar to that in Figure below for several of the components of the shoe to get across the idea that all the various parts are a result of a number of manufacturing processes.



STEP 3: Examine any one of the manufacturing processes in depth. For example, leather production requires energy, water and raw materials and produces a product and air, water, or land pollution as well as solid waste. You may also develop a chart showing the details of one process. Discuss how for each part that goes into the final product, a similar chart could be developed.

STEP 4: Discuss the impact the different processes have on the environment, the fact that all of the shoe parts have some impact on the environment, and that everything we buy as consumers comes with an environmental price tag.

STEP 5: To conclude ask the students to do a balancing between input and output. Inputs = Outputs. Inputs include both renewable and nonrenewable raw materials, energy, water, etc. Outputs include product, any by-products, air, water, and ground pollution, and solid waste. You may come up with a flow chart as shown below





Calculate your ecological footprint
Visit: <http://www.earthday.net>

What is Climate change?



An increase in the Earth's temperature is being caused by human activities such as burning coal, oil and cutting down of trees. Such activities release carbon dioxide, methane, and other gases into the atmosphere, which form a blanket around the Earth, trapping heat and raising temperatures on the Earth. This phenomenon of the increasing temperatures on Earth is called Global Warming. The gases which cause global warming are called green house gases.

Climate change is the most important global environmental change facing humanity with implications for food production, natural ecosystems, fresh water supply and health. The unequivocal warming of the climate system is now evident from observations of increase in global average air and ocean temperatures, widespread melting of snow and ice and rising sea levels.

When do you send greenhouse gases into the air?

Whenever you...

- Use the air conditioner
- Turn on a light
- Use a hair dryer
- Ride in a car
- Listen to a stereo
- Use a washing machine
- Use a dish washer
- Microwave a meal
- Watch TV or play a video game

To perform any of these functions, you need to use electricity. Electricity comes from power plants. Most power plants use coal and oil to make electricity. Burning coal and oil produces greenhouse gases.

The refrigeration systems apart from using electricity also release chlorofluorocarbons (CFCs) which are again green house gases.

Why should we care about Climate Change?

The following would be the probable scenario by the end of the 21st Century.

- Temperature will have increased by 1- 3.5 ° C depending on population and economic growth.
- Sea level will be 15 - 90 cm higher, threatening about 92 million people with floods.
- Rainfall would have decreased and there would be a reduction in crop yields.

Causes of Climate Change

The causes of climate change can be divided into two categories. They are as follows.

1. Natural causes

- Continental drift- this drift also had an impact on the climate because it changed the physical features of the landmass, their position and the position of water bodies.
- Volcanoes- when a volcano erupts it emits large volumes of sulphur dioxide (SO₂), water vapour, dust, and ash into the atmosphere.
- Ocean currents - Much of the heat that escapes from the oceans is in the form of water vapour, the most abundant greenhouse gas on Earth.

2. Human causes

- Large scale use of fossil fuels such as oil, coal and natural gas to run vehicles, generate electricity for industries, households, etc.
- People moving from rural areas to the cities.
- Natural resources are being used extensively for construction, industries, transport, and consumption.

Impacts of climate change

Agriculture

Climate change will affect agricultural yield directly because of alterations in temperature and rainfall, and indirectly through changes in soil quality, pests, and diseases.

Weather

A warmer climate will change rainfall and snowfall patterns and will lead to increased droughts and floods. Rising warmth will lead to an increase in the level of evaporation of surface water; the air will also expand and this will increase its capacity to hold moisture. This, in turn, will affect water resources, forests, and other natural ecological systems, agriculture, power generation, infrastructure, tourism, and human health.

Sea level rise

The heating of oceans, and melting of glaciers and polar ice sheets, is predicted to raise the average sea level by about half a metre over the next century. Sea-level rise will have a number of physical impacts on coastal areas.

Forests and wildlife

Ecosystems sustain the Earth's entire storehouse of species and genetic diversity. Plants and animals in the natural environment are very sensitive to changes in climate. Mountain parks have been identified as being especially at risk from the environmental destruction caused by climate change. Climate change will affect the flight pattern and shift the feeding points of migratory birds.

Health

- Changes in weather pattern, can lead to ecological disturbances, changes in food production levels, increase in the distribution of malaria, and other vector-borne diseases.
- Fluctuations in climate especially in temperature, precipitation, and humidity can influence biological organisms and the processes linked to the spread of infectious diseases.
- Higher temperature will cause the sea levels to rise that could lead to erosion and damage to important ecosystems such as wetlands and coral reefs. Direct impact of this rise would include deaths and injury caused by intense flooding.
- Temperature rise would indirectly result in geo-hydrological changes along the coastline such as saltwater intrusion into the groundwater and the wetlands, coral reef destruction, and damage to drainage in the low-lying areas.
- Climate change could increase air pollution levels by accelerating the atmospheric chemical reactions that produce photochemical oxidants due to a rise in the temperature.

What we can do to cut down climate change...

- Talk with your family and friends about global warming. Let them know what you've learned
- Planting trees is fun and a great way to reduce greenhouse gases. Trees absorb carbon dioxide, a greenhouse gas, from the air.
- Buy more efficient household appliances.
- Replace all incandescent bulbs by compact fluorescent bulbs that last four times longer and use just one-fourth of the electricity.
- Use sodium vapour lights for street lighting; these are more efficient.
- Keep car engines well tuned and use more fuel-efficient vehicles.
- Form car pools and encourage parents and friends to do the same.
- Cycle or walk to the neighbourhood market.
- You can save energy by sometimes taking the bus, riding a cycle, or walking
- Recycle cans, bottles, plastic bags, and newspapers. When you recycle, you send less trash to the landfill and you help save natural resources, like trees, oil, and elements such as aluminum.
- One of the ways to reduce the amount of greenhouse gases that we put into the air is to buy products that don't use as much energy. Buying products (computers, TVs, stereos and VCRs) with ENERGY STAR® labels that have been specially designed to save energy will help protect the environment.

- Cars also cause pollution and release a lot of greenhouse gases into the air. Using gasoline cars can help reduce the amount of greenhouse gases in the air.

Development Alternatives has established a Climate Change Centre. The Centre has made active contributions to research, advocacy and outreach programmes related to Climate Change. It has been actively involved in climate change science, negotiations and mitigation and adaptation measures for almost two decades.

Know more : <http://climatechangecentre.org/>

Green Consumer

We have already discussed in this section various ways in which we can adopt patterns of production and consumption that safeguard Earth's regenerative processes. We have the power to become a Green Consumer

Who is a Green Consumer?

A consumer who can enjoy a good quality of life while consuming fewer natural resources and polluting less and hence consuming sustainably is a Green Consumer.

Green consumerism is a function-based approach, looking at human needs - for food, shelter and mobility and - then seeing how to meet those needs more sustainably.

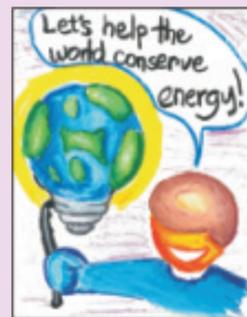
Sustainable purchasing

The great thing about being a Green Consumer is that you end up saving money while helping the environment at the same time. Think about the effect of your purchases on the environment by buying products in the largest size you can use and by buying long lasting reusable items. Things with excess packaging and products that need to be discarded after only a few uses cost more money, use up valuable resources and create more waste.

TO BE A GREEN CONSUMER

There are positive ways to influence consumers as in the case of detergent makers who tell consumers to switch to low-temperature washing liquids and powders, not just to save energy but because it is good for their clothes. We can save 8% of household electricity by switching off the standby mode of appliances.

By using recycled paper, we can save on trees, water, and power and reduce the pollution load. For every ton of 100% post-consumer waste recycled paper that we use, we not only save 12 full grown trees and nearly 1475 liters of oil but also prevent the generation of 900 Kgs. of Green House Gases.



MAKING THE BEST BATTERY DECISIONS

- Purchase rechargeable batteries wherever possible.
- When rechargeable batteries can no longer be recharged (after as many as 1,000 uses, according to some estimates), take them to a retailer that is participating in a recycling program.
- Look for products that eliminate or minimize battery use, and avoid products with unnecessary features that might require additional battery power. Some electronic devices also give you the option to run at a lower power setting, extending battery life.
- Study the different kinds of batteries on the market. That will help you choose the optimal battery for each application and maximize its power.

Thousands of tons of batteries are discarded each year in this country, posing serious threats to public health and the environment. When dumped into landfills, they can leach mercury, lead, cadmium and nickel into the groundwater. When incinerated, these heavy metals linked to cancers and respiratory illnesses are released into the air.

The particular difficulty with the materials in batteries is not just that these are toxic, but also persistent. When they get into the environment, they don't break down and the cumulative impact is enormous. This makes keeping them out of the waste stream absolutely crucial. Recycling also recovers metals and plastics that can be used for new products and reduces the energy required as compared to making batteries from virgin materials.

Green Shopping Tips:

- Buy products in the largest size you can use; avoid excess packing.
- Buy products in containers you know you will be able to recycle.
- Buy reusable and long lasting items.
- While choosing green products, we should remember that a 'cradle-to-grave' approach should be used to understand green products and that even green products have an environmental impact. The greenest option is 'Don't Buy'.

Green consumerism is a life choice it is not just what we buy, but also how we live. The triple bottom line being economically viable, environmentally sound, and socially responsible. We the consumers need to be pro-active.

FOR STUDENTS:

Sample consumer survey questionnaire to test the following issues:

1. What kind of an image of the environment-friendly product do consumers have in their mind?
2. What attributes would consumers look into while buying something greener?
3. Which brands were considered environment-friendly and the reasons thereof?
4. After defining the eco-friendly products, what degree of interest did the respondents have in different functions of green product ranging from minimal damage to environment, safety for the health of wildlife and human society, saving in energy, and environmental damage during manufacture.
5. For different product categories, what was the readiness to buy, actual purchase behaviour and percentage premium they were willing to pay.
6. The factors which in the view of the respondent influenced the preference of people for environment-friendly products.
7. The agreement or disagreement with statements signifying various kinds of attitudes towards environment-friendly products. For instance, whether a person refused a plastic bag while carrying a product or did she take a cloth bag while buying grocery or vegetables. Similarly, whether one thought it was the government's job to worry about environment problems or had one ever switched brand preferences because of environmental reasons. Also, whether people had looked around to find out about the possible sources of organically grown food.
8. Degree of interest respondents have in different environmental issues and how much time they are willing to spend on each of the aspects.

There is widespread interest among consumers in environmental issues, but this interest does not always translate into significant changes in purchasing. (e.g., those motivated in part or primarily by environmental attributes rather than those of function, cost, value or features).

Do a simple survey and check it out!

Have you sought out products with recyclable packaging?	
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>
For each statement, please tell me if you completely agree with it, mostly agree with it, mostly disagree with it or completely disagree with it: <i>People should be willing to pay higher prices in order to protect the environment.</i>	
Completely agree	<input type="checkbox"/>
Mostly agree	<input type="checkbox"/>
Mostly disagree	<input type="checkbox"/>
Completely disagree	<input type="checkbox"/>
Don't know	<input type="checkbox"/>
Have you ever stopped buying a product specifically because the manufacturer of that product pollutes the environment?	
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Don't know	<input type="checkbox"/>

Children can change the world

Over the years, there has been a shift in the overall attitude toward sustainable business practices and green living - a shift from consumption to conservation when it comes to natural resources, and a move from disregard to genuine concern in the way we view the ecology of the planet.

Jason Olive, a one-time top athlete at the University of Hawaii, turned to a career in the arts before focusing his attention on social responsibility by founding a charity to improve the lives of children through the sport of volleyball. "When people think of 'changing the world,' rarely do they imagine the immense power they already possess to do so," Olive says, "Oftentimes, people believe that they must first reach a position of power to become powerful. The irony is that no one will ever be what they are not now already."

Hearing words like these further one's belief that the focus on green business practices and green living is due in large part to how children are educated and what they see everyday. Children can and have the power to change the world.

Excerpts from: Between Blue and Yellow- The [Power to Change the World](#) by Jeff Orloff

PRINCIPLE 8

ADVANCE THE STUDY OF ECOLOGICAL SUSTAINABILITY AND PROMOTE THE OPEN EXCHANGE AND WIDE APPLICATION OF THE KNOWLEDGE ACQUIRED.



- Support international scientific and technical cooperation on sustainability, with special attention to the needs of developing nations.
- Recognize and preserve the traditional knowledge and spiritual wisdom in all cultures that contribute to environmental protection and human well-being.
- Ensure that information of vital importance to human health and environmental protection, including genetic information, remains available in the public domain.

Objectives:

- To explain the importance of cooperation and sharing of knowledge for sustainable environment management
- To make the students aware about the significance of preservation of traditional knowledge and spiritual wisdom
- To make the students aware of the role of information and the use of 'Right to Information', as a tool to get information.

"If you have knowledge, let others light their candles in it."

- Margaret Fuller.



These words of Margaret Fuller have a lot of in-depth meaning attached to them. Knowledge gained by you holds value only when it is distributed openly. It is one wealth which increases with distribution. Thus as responsible citizens of the country it should be our moral responsibility to promote widespread knowledge in all spheres to ignite the minds of all. And this is exactly what is emphasized upon in the 8th principle of the earth charter, which states:

Advance the study of ecological sustainability and promote the open exchange and wide application of the knowledge acquired.

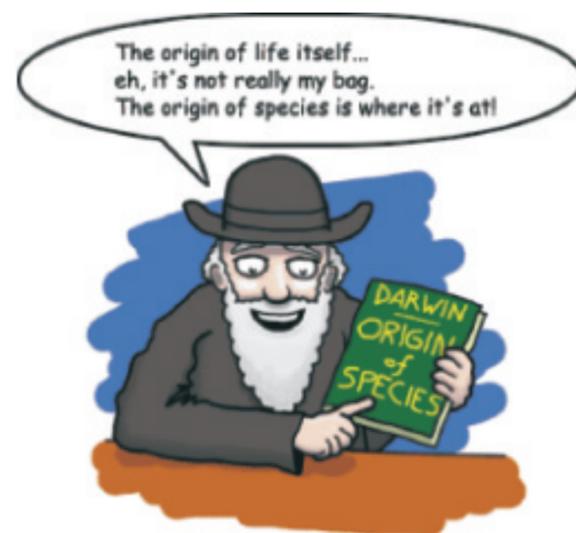
Healthy ecosystem, biodiversity, conservation of species, curbing of pollution are all essential components to ensure a sustainable environment. All these things that are an integral part of the

YOUR ROLE:

DISCUSS AND DEBATE:



- How effective has the incorporation of environmental studies as a mandatory subject proved to be in creating awareness among students?
- Debate on the topic: "We do not inherit the earth from our ancestors; we borrow it from our children."



ACTIVITY: BULLETIN BOARD

A special bulletin board can be set aside in the school or class for environment-related affairs. A small group can be made responsible for each week's display. The students will need to follow the daily newspapers to clip out environment-related news and display this attractively, so that the whole school/class is attracted to come and read it and also the whole school is aware about the latest development in the environment field.



We have now already discussed the importance of cooperation and sharing of knowledge. It is time now that we also discussed the various components of the environment that make it so vital for us to know about them, various ways in which they are an integral part of our life. We shall now discuss about the importance of recognizing and preserving the traditional and spiritual wisdom that we gain from our elders, and also various indigenous and natural ways to protect the environment.

Traditional knowledge

Human communities have always generated, refined and passed on knowledge from generation to generation. Such 'traditional knowledge' is often an important part of their cultural identities. Traditional knowledge has played, and still plays, a vital role in the daily lives of the vast majority of people. Traditional knowledge is essential to the food security and health of millions of people in the developing world. In many countries, traditional medicines provide the only affordable treatment available to poor people. In developing countries, up to 80% of the population depend on traditional medicines to help meet their healthcare needs. In addition, knowledge of the healing properties of plants has been the source of many modern medicines.

How can traditional knowledge be defined?

Whilst the vast majority of the knowledge is traditional in the sense that it has been handed down through the generations, it is continually refined and new knowledge developed, rather as the modern scientific process proceeds by continual incremental improvement rather than by major leaps forward. Whilst most traditional knowledge and folklore is passed on orally, some of it, such as Ayurveda medicinal knowledge, is documented in texts. The nature of the knowledge is also diverse: it covers, for example, literary, artistic or scientific works, song, dance, medical treatments and practices and agricultural techniques.

India as we all know is a land of woodcrafts, pottery, masonry etc. Here, the crafts sector is second only to agriculture in supporting livelihoods. Both agriculture and crafts have an intimate relationship with Nature- a potter gets earth from a nearby pond, wood for his kiln is collected from the forest close by. The well being of the potter being the well being of the craft and knowledge, the well being of the family and future generations is closely linked to the well being of the pond, the forest and the community which buys the earthen ware.

Example of one such art that has been popular and prevalent in India, and is carried on from generation to generation in a family is Madhubani Painting.



The origins of Madhubani Painting or Mithila Painting are shrouded in antiquity and a tradition states that this style of painting originated at the time of the Ramayana when King Janak commissioned artists to do paintings at the time of marriage of his daughter Sita to Hindu god Lord Ram.

Madhubani painting has been done traditionally by the women of villages around the present town of Madhubani (the literal meaning of which is forests of honey) and other areas of Mithila. The painting was traditionally done on freshly plastered mud walls of huts but now it is also done on cloth, hand-made paper and canvas.

As Madhubani painting has remained confined in a compact geographical area and the skills have been passed on through centuries, the content and the style have largely remained the same. Madhubani painting also uses three dimensional imageries and the colours used are derived from plants.

Madhubani paintings mostly depict nature and mythological events and the themes generally revolve around Hindu deities like Krishna, Ram, Shiva, Durga, Lakshmi and Saraswati. Natural objects like the sun the moon and the religious plants like tulsi are also widely painted along side scenes from the royal courts and social events like weddings. Generally no empty space is left; the gaps are filled by paintings of flowers, animals, birds and even geometric designs.

Traditionally, painting was one of the skills that were passed down from generation to generation in the families of the Mithila Region mainly by women. The painting was usually done on walls during festivals, religious events and other milestones in one's life such as birth, Upanayanam (sacred thread ceremony) and marriage.

The colours that are used to paint the paintings are extracted from seeds, dried flowers, leaves, bark, stones etc. Thus if forests and biodiversity is damaged such crafts will also suffer as they share a direct link with Nature.



ACTIVITY:

India as we all know is a land of various cultures and traditions; this is the quality that makes our country so unique. Even you, as a responsible citizen of the country should know about them.

Collect information of various cultures with special emphasis on the environment and things closely associated with it. You can do that by reading epic stories etc. For instance, in many old epic stories, you would find mention of some special animal or how in those days, trees and forests were very vital for man and that our sages used to reside there. You can make a project in pictorial form to make it look more vibrant or give a power point presentation to share the information with your friends.

Find out from your grandma, what she used to prepare when your father suffered from cold?



Managing the Traditional Knowledge

Only recently, however, has the international community sought to recognise and protect traditional knowledge. In 1981, World Intellectual Property Organisation (WIPO) and United Nations Educational, Scientific and Cultural Organization (UNESCO) adopted a model law on folklore. In 1989 the concept of Farmers' Rights was introduced by the FAO into its International Undertaking on Plant Genetic Resources and in 1992 the Convention on Biological Diversity (CBD) highlighted the need to promote and preserve traditional knowledge. In spite of these efforts which have spanned more than two decades, final and universally acceptable solutions for the protection and promotion of traditional knowledge have not yet emerged. There are a number of cases where wrong patents have been issued, these cases involve what is often referred to as 'biopiracy'.

BIOPIRACY

There is no accepted definition of biopiracy. The Action Group on Erosion, Technology and Concentration (ETC Group) defines it as **the appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals or institutions seeking exclusive monopoly control (usually patents or plant breeders' rights) over these resources and knowledge.**

The following have been described as biopiracy:

- The granting of 'wrong' patents.** These are patents granted for inventions that are either not novel or are not inventive having regard to traditional knowledge already in the public domain. Such patents may be granted either due to oversights during the examination of the patent or simply because the patent examiner did not have access to the knowledge. This may be because it is written down but not accessible using the tools available to the examiner, or because it is unwritten knowledge. A WIPO led initiative to document and classify traditional knowledge seeks to address some of these problems.
- The granting of 'right' patents.** Patents may be correctly granted according to national law on inventions derived from a community's traditional knowledge or genetic resources. It could be argued this constitutes biopiracy on the following grounds:
 - Patenting standards are too low. Patents are allowed, for instance, for inventions which amount to little more than discoveries. Alternatively, the national patent regime (for example, as in the US) may not recognise some forms of public disclosure of traditional knowledge as prior art.
 - Even if the patent represents a genuine invention, however defined, no arrangements may have been made to obtain the Prior Informed Consent (PIC) of the communities providing the knowledge or resource, and for sharing the benefits of commercialisation to reward them appropriately in accordance with the principles of the CBD.

CONTROVERSIAL PATENT CASES INVOLVING TRADITIONAL KNOWLEDGE AND GENETIC RESOURCES

Turmeric

Turmeric (*Curcuma longa*) is a plant of the ginger family yielding saffron-coloured rhizomes used as a spice for flavouring Indian cooking. It also has properties that make it an effective ingredient in medicines, cosmetics and as a dye. As a medicine, it is traditionally used to heal wounds and rashes.

- In 1995, two Indian nationals at the University of Mississippi Medical Centre were granted US patent no. 5,401,504 on 'use of turmeric in wound healing'.
- The Indian Council of Scientific and Industrial Research (CSIR) requested the US Patent and Trademark Office (USPTO) to re-examine the patent.
- CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and therefore its medicinal use was not novel.
- Their claim was supported by documentary evidence of traditional knowledge, including an ancient Sanskrit text and a paper published in 1953 in the Journal of the Indian Medical Association.
- Despite arguments by the patentees, the USPTO upheld the CSIR objections and revoked the patent



Observations: The turmeric case was a landmark case as it was the first time that a patent based on the traditional knowledge of a developing country had been successfully challenged. The legal costs incurred by India in this case have been calculated by the Indian Government to be about US \$10,000.

Neem (*Azadirachta indica*) is a tree from India and other parts of South and Southeast Asia. It is now planted across the tropics because of its properties as a natural medicine, pesticide and fertilizer. Neem extracts can be used against hundreds of pests and fungal diseases that attack food crops; the oil extracted from its seeds is used to treat colds and flu; and mixed in soap, it is believed to offer low cost relief from malaria, skin diseases and even meningitis.



- In 1994 the EPO granted European Patent No. 0436257 to the US Corporation W.R. Grace and USDA for a 'method for controlling fungi on plants by the aid of a hydrophobic extracted neem oil'.
- In 1995 a group of international NGOs and representatives of Indian farmers filed a legal opposition against the patent.
- They submitted evidence that the fungicidal effect of extracts of neem seeds had been known and used for centuries in Indian agricultural to protect crops, and thus the invention claimed in EP257 was not novel.
- In 1999 the EPO determined that according to the evidence 'all features of the present claim have been disclosed to the public prior to the patent application... and [the patent] was considered not to involve an inventive step'.
- The patent was revoked by the EPO in 2000.

Ayahuasca: For generations, *shamans* of indigenous tribes throughout the Amazon Basin have processed the bark of *Banisteriopsis caapi* to produce a ceremonial drink known as 'ayahuasca'. The shamans use ayahuasca (which means 'vine of the soul') in religious and healing ceremonies to diagnose and treat illnesses, meet with spirits, and divine the future.

An American, Loren Miller obtained US Plant Patent 5,751 in June 1986, granting him rights over an alleged variety of *B. caapi* he had called 'Da Vine'. The patent description stated that the 'plant was discovered growing in a domestic garden in the Amazon rain-forest of South America'. The patentee claimed that Da Vine represented a new and distinct variety of *B. caapi*, primarily because of the flower colour.

The Coordinating Body of Indigenous Organizations of the Amazon Basin (COICA) and on their behalf the Center for International Environmental Law (CIEL) filed a re-examination request on the patent. CIEL protested that a review of the prior art revealed that Da Vine was neither new nor distinct. And the patent claim was rejected agreeing that Da Vine was not distinguishable from the prior art presented by CIEL and therefore the patent should never have been issued. However, further arguments by the patentee persuaded the USPTO to reverse its decision and announce in early 2001 that the patent should stand.

Observation: Because of the date of filing of the patent, it was not covered by the new rules in the US on *inter partes* re-examination. CIEL were therefore unable to comment on the arguments made by the patentee that led to the patent being upheld.

Do you know that YOGA is also getting patented by USA?

Losing out diverse knowledge of sacred groves

India now faces the twin crises of loss of biodiversity, and of the community knowledge associated with its use. India has a long tradition of prudent use and wise conservation of all resources that are useful to people. Conservation ethos and traditions are so deep that divinity status is given to almost all forms of life. 'Sacred groves' (patches of forest dedicated to local deities) are unique and distributed all over India. There are about 17,000 known sacred groves in different phyto-geographical regions and forest types of India. These protected forest patches dedicated to gods and goddesses, survived the axe of development, political turmoil and natural calamities because of the conservation ethics coupled with taboos and traditions. Hence, in the present context 'sacred groves' are not merely patches of forest, but are islands in a desolate landscape. They represent the past status of vegetation and biotic as well as abiotic diversity of the region.



However, it is found that the number of groves is declining as social values and religious beliefs are changing due to modernization, urbanization and expansion of the market economy. Habitat destruction is on rise in these once socially guarded ecosystems. However, no concrete steps are being initiated to protect and conserve these groves, mainly due to lack of accurate and adequate information. Therefore, in-depth assessment of these natural resource pockets can be an excellent tool for any regional biodiversity planning. Information of such culture and traditions, conservation history, taboos and stories associated with them would also be documented.

Activity: adopt heritage tree

The students could adopt a nearby heritage tree. To begin with, the students could improve the knowledge about the heritage tree by collecting the information from various sources about its religious, social and environmental significance. They could then compile their findings into a poster, pamphlets or booklets and distribute them to the visitors. They could also put an information signage with the permission from the authorities. They could initiate an awareness campaign in the area to make the local people aware about the significance.



Find a sacred grove near your city and write about its religious, social and environmental significance.

Right to Information

Right to information is very important in today's times, especially in democracies like India, to keep a check on the functioning of the government so that it does not behave in an arbitrary manner. Citizens of a nation have a right to be informed and it can be exercised if they have a right to gain information. Right to Information is a part of fundamental rights. People are the masters. Therefore, the masters have a right to know how the governments, meant to serve them, are functioning. Further, every citizen pays taxes. Even a beggar on the street pays tax (in the form of sales tax, excise duty etc) when he buys a piece of soap from the market. The citizens therefore, have a right to know how their money is being spent. True definition of the right to information is:



An Act to provide for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.

Main features of this right:

- Access to information to all citizens.
- Reduce corruption and arbitrary action of any kind on the part of the governing bodies.
- Promote transparency and accountability.
- Create awareness and inculcate a sense of responsibility in the mind of every citizen.



CASE STUDY:

NGOs have found a powerful weapon to question the government on important issues like education, environmental protection, health, civic facilities, etc. For the first time after independence, the Act has enlightened hope among the citizen for better services from government.

This act can be exercised on any development activity, and people can not only gain information under the act, but also if they find the proceedings hazardous for the environment, they can mobilize movements against it. For instance, the construction of a shopping mall in Vasant Kunj in the eco-fragile Ridge area was found to be environmentally unsound and several NGOs and citizens met to mobilize public support against it.

BECOME A RESPONSIBLE CITIZEN:

Now that you have a concrete idea as to what exactly is the 'right to information', find out the way to exercise this right; and if your right is being violated, find out the procedure in which you can appeal in the court of law for violation of fundamental right.

Observe various activities happening in your locality. Try and gain more information regarding their functioning, and if you feel any of it is violating environmental laws or it's outcome is hazardous for the environment, mobilize a movement to protect it. Take remediative steps. Make a list of things you can do in such a scenario to protect the laws and environment and exercise your right in an efficient manner.



ACTIVITY:

Make a list of commercial projects that violated environmental laws and then the right to information were used to curb the proceedings. Begin from filing the case; follow the proceedings to the verdict. Was the trial fair?

Collect newspaper articles that carry information of such cases, cut them and make a collection to keep a record.

Write in your journal regarding some specific commercial activity that according to you is violating environmental laws. Or on any environmental issue that attract your attention.



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