

Reserved Judgment

**IN THE HIGH COURT OF UTTARAKHAND AT
NAINITAL**

WRIT PETITION (PIL) No.54 OF 2016

In the matter of the Protection of Forest
Environment, Ecology, Wild Life etc. from the Forest Fire

.....Petitioner.

Vs.

Union of India and others

.....Respondents

Mr. Rajeev Singh Bisht, Amicus Curiae for the petitioner.

Mr. Rakesh Thapliyal, Assistant S.G. for Union of India/respondent No.1.

Mr. Pradeep Joshi, Standing Counsel for the State of Uttarakhand/respondent Nos.2 & 3.

Reserved on : 10.11.2016

Decided on : 19.12.2016

Coram : Hon'ble Rajiv Sharma , J.
Hon'ble Alok Singh, J.

Per : Hon'ble Rajiv Sharma, J.

On the oral request of learned counsel for the petitioner, the Ministry of Railways is added as respondent in the array of the parties.

The Court has taken a judicial notice of the frequent occurrence of forest fires and devastation caused to the forest wealth, ecology, economy and environment on the basis of news items. This Court had also directed the respondents to file affidavits on various issues on 02.05.2016. The affidavit was filed by the State on 07.05.2016. In the affidavit, filed on behalf of Union of India, it is stated that as per the information received from the Government of Uttarakhand, 922 fires have been reported during the current fire season upto 29.04.2016, effecting 1890.79 hectares of land, causing an estimated damage of Rs.18,01,695. The Ministry of Home Affairs, Government of India has constituted a team of experts to undertake a visit to the affected areas to take stock

of the situation and to suggest appropriate measures to prevent forest fires in addition to rescue the affected persons and to take other measures to ensure environment safety etc. It is also stated that Forest Survey of India, Dehradun, under the Ministry of Environment, Forest & Climate Change, has developed an indigenous methodology to detect forest fires from the fire spots by a Web Fire Mapper under the project named as 'Forest Fire Monitoring in India'. The Ministry has also issued guidelines to all the States and Union territories for preparation of State Level Crisis Management Plan for the forest fire vide letter dated 29.01.2010. The Government of India provides the financial and technical assistance to the State Governments as per their specific needs and availability of resources. For this purpose, the Central Government has released the funds to the State of Uttarakahnd under a Centrally Sponsored Scheme during the last five years which is as follows:-

Financial Year	Fund released (Rs. In Lakhs)
2012-13	342.62
2013-14	299.33
2014-15	332.57
2015-16	356.83

The State Government has also filed a detailed affidavit wherein it is stated that as on 05.05.2016, 1798 incidents of forest fire were reported and total 3948.15 hectares of forest area was affected. The Ministry of Environment, Forests and Climate Change, vide letter dated 16.11.2015, has recognized the following methods of prevention and control of the forest fire:-

- a. Construction of watch towers for detection of forest fires.
- b. Deployment of fire watchers.
- c. Creation and maintenance of fire lines.

- d. Involvement of local communities.
- e. Beating of fire with bushes and use of water to douse the fire.
- f. Use of remote-sensing technology.

In this connection, the State Government has taken following proactive steps to manage and control forest fires:

- i. Approval of District Fire Management Plan.
- ii. Awareness Generation programmes.
- iii. Rotational burning/controlled burning of forest floor litter.
- iv. Clearing of fire-lines in the forests.
- v. Master control room
- vi. Watch towers
- vii. Crew stations
- viii. Wireless communication network
- ix. Satellite based information system
- x. Efficient fire fighting tools
- xi. Detection of fire incidents
- xii. Continuation of multimedia campaign
- xiii. 40MCRs and 1166 crew stations have been reinforced.
- xiv. Number of fire watchers have been increased from 3000 to 6000.
- xv. One team of SDRF and three team of NDRF have been deployed.
- xvi. 500 employees have been engaged for forest fire fighting.
- xvii. Water tankers have been provided.
- xviii. Three M.I. helicopters were also deployed.

In sequel of the queries raised by this Court in its order dated 02.05.2011, it has been apprised that total 1798 incidents of forest fires have taken place till 05.05.2016. Total 3238 trees of different species have been affected in the fire as per information received from Divisional Forest Officers of the State. The type of trees are; Pine, Oak, Bamboo, Kachnar, etc. According to the report received from Divisional Forest Officers, 1412 pine trees out of 3238 trees were affected by the forest fire. Approximately, 431 trees out of 1412 were affected under use of resin tapping. Nodal Officer and other forest officials are getting daily post fire alerts from the National Remote Sensing Centre (NRSC) and Forest Survey of India (FSI) through e-mail and SMS. It is also stated that Nodal officer shall receive weather forecast from IMD through e-mail and the same is spread through social media. He may link the weather forecasting with the official website of the forest department. There are 12045 personnel including fire watchers, police, revenue, Disaster Relief force, Home guards, Prantiya Rakshak Dal and local villagers. Equipment and tools like fire rakes, Macleod, Pulaski, water bottles, torches, helmet, wireless sets, fire aid boxes, hygrometers, thermometers are also available. A sum of Rs.21.75 crores is available to prevent forest fires. Most of the forest fires are manmade. Total 814 forest offences were registered till 04.05.2016. Most of the forest fires are surface fires. Incidents of crown fire occur rarely. Foam was not used. No other fire retardant is being used for controlling the forest fires. A number of guidelines have been issued to the forest officers/officials.

What emerges from the affidavits, that till 05.05.2016, total 1798 incidents of forest fires have taken place. Total 3238 trees of different species have been affected in the fire. Most of the trees are pine trees. The State has only used water for controlling the forest fire. Now, the State

Government has started awareness programme to prevent forest fires.

As per the report of Mr. Rajiv Singh Bisht, Advocate, who was appointed as Amicus Curiae by this Court, the forest fires also create heavy smog which affects the ecology of entire area and it is also endangers the human and animal lives. He has also suggested the control and prevent of forest fires. He also submitted that more than 16000 hectare of forest land has been encroached by the Gujjar community.

Steps taken by the respondents/States to control and prevent the forest fires are far from being satisfactory. Only a sum of Rs.21.75 crores has been sanctioned. Forest should be protected. State Government should use foam and other fire retardants. No steps have been taken by the State Government to evict the Gujjar community from the forest land.

Petitioner has also suggested methods to protect and control the forest fires. State Government should take sufficient steps to control and prevent forest fires effectively.

The Environment Ministry has released the India State of Forest Report. India's forest as per report cover is 701,673 Sq.km. It is about 21.34% of the total mass land. 50% of India's forest areas are fire prone. In 1995, around 3,75,000 hectares area was affected in Uttarakhand by forest fires. It was around 80,000 hectares area in Ganga-Yamuna Watershed in 1999. The total forest area in Uttarakhand is about 34359 Sq. Km., it is about 67.20% of the total mass land.

In Himachal Pradesh, it was around 19,000 hectares forest area. The incidents of forest fires reported in

India in the year 2013 are around 18,451. Forest is the wealth. Forest fires should be prevented by the Forest department and responsibility should be fixed to control the forest fires. There is adage; that "Prevention is better than Cure".

It is apparent that there is lack of training of forest officers to control forest fire. There is also lack of man power. The information must be released immediately. Local people should also be included to control the forest fires. The fire also affects natural forest eco system. The cause of pine fire is accumulation of pine needle on the ground. These are required to be removed and utilized. Forest fires must be controlled at the earliest. The Fauna and Flora is also adversely affected. More water tanks are required to maintain moisture in atmosphere. The repeated forest fires cause tremendous loss of timber. Wild life is also affected. It may result in depletion of wildlife. The scheme/policy for preventing forest fire should be pragmatic and not ad-hoc. Their should be proper fire management. People living in forest and outside area must be told about devastation caused by forest fires. The communication network is required to be strengthened.

There is depletion of rain fall in the entire Uttarakhand. The food production has come down drastically. The snow pattern has also changed.

We can also take a judicial note of the fact that three elephants have died in Rajaji National Park on Railway track. Railway and forest authorities are required to take all necessary precaution to save the life of wild animals. No wild animal should be declared man-eater, rather, efforts should be made to capture wild animal alive, thereafter, it should be released in its own habitat.

400 leopards were killed between 2001-2016. 45 leopards were killed only in the year 2016. Urgent steps are required to be taken to arrest the death of leopards. Several leopards die due to use of snare, poaching, poisoning and electric fencing etc.

“In the north, there stands Himalaya the kind of the mountains, having a divine soul. It exists like a measuring rod of earth, having reached the eastern and western seas. – Kalidas (Kumara-sambhava).”

The Nobel Prize laureate and poet, Rabindranath Tagore, in his book *Tapovan*, has explained the importance of nature as under :-

“Indian civilisation has been distinctive in locating its source of regeneration, material and intellectual, in the forest, not the city. India’s best ideas have come when human beings were in communion with trees. Indian thinkers were surrounded by and linked to the life of the forest, and the intimate relationship between human life and living nature became the source of their knowledge.”

In one of the articles contained in “The Secret Abode of Fireflies, Loving and Losing Spaces of Nature in the City”, the importance of trees is explained in article “Foresters without Diplomas” written by Sri Wangari Muta Maathai (Kenyan Environmentalist and Nobel Peace Winner-2004) as under :-

“We could see Mount Kenya from my house, and I grew up hearing that God lives in Mount Kenya and all good things come from there. The

clouds, the rains, the rivers in which I played with frogs' egg and tadpoles; they all start from there. And they said that sometimes Ngai likes to take a walk in the mountains and the forests. If anyone used their machetes to cut down trees, it was said that the trees would bleed. You were only allowed to collect dry, fallen wood for fuel these forests full of fig trees.

'For my people, the fig tree is scared and when we were growing up it was everywhere. I would go collect firewood for our mother; she warned me, "Do not collect firewood from a fig tree. That is a tree of God. We don't cut it. We don't burn it. We don't use it for beauty. It must stand there." When we offer sacrifice, we do it under a fig tree, 'she shares, urging on a greater awareness of how an awesome symmetry binds people to their land and to each other, her thoughts seamlessly flowing in and out of each other and her eyes, brilliant points, charging the mellow lighting and cream sophistication of the room. 'I am spiritually nurtured by the fact that what I am doing is in accordance with a spiritual constitution, a rhythm. For me, in the work that I do, it is a spiritual fulfillment, rather than a religious or dogmatic conviction. I was raised by people who were not detached from the land. We didn't have anything written, all our scriptures were oral, and they are embedded in me, although I went through Christian teaching and became a Catholic. But I do find that even in other scriptures, you come across a Garden of Eden or some engagement with nature. And there is much more to forests than trees; trees are only what we see, and there is so much we still don't understand,' she stresses.

Wangari continues with glorious concentration, 'One of the ways through which communities conserve their biodiversity and their resources is through culture, and I want to emphasize that for me culture is very important, very enriching, because culture influences who we are. Festivals, rituals and ceremonies are all a part of our culture as well, and can you imagine how much we conserved because we incorporated nature into our festivals, into our religions, into our dances, into our songs, into our symbols, into our stories? And they define who we are. When they are destroyed, our environment too is destroyed. Any very often when we forget who we are, we lose all our wonderful associations, our values that we've brought from the past generations. Once this gets translated into resources, it is converted into money...but in life everything is not money!' her voices rises, indignant, exasperated.

'To a very large extent, I think, globalization is a threat to the environment in countries that are not developed industrially, in countries that are poor, because these countries are looking towards globalization as an answer, and believe that corporations will get them out of poverty. Very often, these corporations simply do business, take their profits and go- leaving their problems behind. I want to say to them that unless we can appreciate that the planet is very small, that part of the problem is that you think you are doing something to a distant person, a different part of the world. But it will eventually come back to you. We must expand our concept of home, to make sure we see beyond our individual countries. The very first astronauts told us that they were overwhelmed by the fact that they could not see

boundaries, and they felt a strong urge to come back home. Home was that small blue ball we've become familiar with on television, a small ball beyond borders. The whole planet is our concern, wherever we are. They are little things we can do in our lives, we can listen, we can consume less, because this is the only home we have, and we should leave it clean and green for future generations.

'And maybe if I had been born a man, all this would never have struck me,' she says next, looking over to her younger sister who is grinning. She talks about how she arrived at some realizations, 'It happened partly because I was a woman and partly because when I was in the National Council of Women. I started listening to the women from the countryside and got interested in their issues of livelihood and their connection with the environment. The women from the countryside wanted clean drinking water, firewood, good, adequate nutritious food and they needed an income. I grew up! I realized that in the span of about 20 years, a lot of vegetation that I knew had been cleared to bring in cash crops, especially coffee and tea, and indigenous forests were being cleared to make way for forests of exotic species such as eucalyptus from Australia and the pines from the northern hemisphere. As a result, the rain patterns were changing; there was massive soil erosion, so the clean streams that I knew as a child were drying up. That, for me, was the awakening experience. 'So I told the women, "Listening to you, I recognize our environment is changing and I think we can do something about it. Let us plant trees."

In the same book in article captioned “Nature has Rights too” written by Vikram Soni & Sanjay Parikh, the rights of Nature have been explained, as under :-

“Human rights commissions are obligatory vigilantes in all democracies. Human rights are about inequities between one set of human beings and another. These range from usurping the sovereign rights of one nation by another more powerful one, to more local violations. They arise when the rich and powerful exploit the poor and disenfranchised. They reveal themselves in violence against women, violence against members of lower caste and creeds and other such instances. They are horrible acts and are often portrayed graphically.

Violations against nature can be equally appalling despite being viewed through the filter of ‘environmental damage’. The Stockholm Declaration accepts the environment as part of basic human rights-the right to life itself.

The United Nations Millennium Report and the International Panel on Climate Change (IPCC) Reports both indicate that 60 per cent of earth’s ecosystems are experiencing terminal loss. And the loss of these natural resources, whether of the Amazon forest, of sea life, elephants and tigers, rivers and lakes, glaciers or aquifers below the ground is strongly impacting human life.

Whereas human rights occupy centre stage and deal with human conflict, loss of natural resources threatens human survival itself. We must understand that the fundamental human

rights on which human survival depends are Nature's rights.

Language is such a powerful medium of communication that it colours all our metaphors, beliefs and imagination. But language can also craft deception – it can wash over common sense and sensibility. This is the case in the present scenario of extreme material consumption powered by the global free market.

The seductive vision of development has become so pre-emptive that the few remaining original forests – our biodiversity treasury- are being destroyed to make way for huge mines or dams or lucrative real estate projects. And we attempt to balance the destruction with 'compensatory afforestation', words that suggest that whatever damage is being done can be undone or compensated by artificial plantation.

To the unschooled and unsuspecting, this would appear to be a fair trade-off for development. But it is like giving sanction to the insane national that it is all right to kill all wild tigers as long as we replace them by farming the same population in captivity. Can valuable natural biodiversity that has evolved over thousands of years ever be compensated? Such subterfuge finds acceptance by court and government and is often subsumed in the dangerous cliché 'sustainable development'. If sustainable development finishes off all our biodiversity, heritage and resources, is it admissible?

'Green buildings' is acceptable currency in the destruction of valuable heritage and resources. In the popular imagination, the word 'green' is so comforting that it clouds, the real loss, which is

irreplaceable. So do modern terms like 'ecotourism' and 'ecofriendly development', where the prefix 'eco' works to trample the true value of the natural resource. Natural water resources are exploited by commercial building activities for short-term profits; and there's the magical phrase 'water harvesting'. Apart from depleting an irreplaceable natural resource like a deep underground aquifer or a flood plain, it is a well-kept secret that water harvesting saves no more than a fraction of the original resource.

We have to remove the hypocrisy of these 'green' clichés from our dictionary before such language seals our fate.

Having a law is one thing, ensuring its implementation is quite another. The precautionary principle has not been enforced, for example, on big projects like the Three Gorges dam on the Yangtze river in China, which has not been declared a disaster by the government. The Tehri dam on the Ganga, in a seismic Himalayan zone, and the Sardar Sarovar dam on the Narmada in India may follow suit.

Another notion is that poverty is itself a cause of pollution and that economic development will remove poverty and improve the environment. Poverty alleviation is often misused to justify development at the cost of environmental degradation. Let's see what is happening to people who have no link with the global economy but live simply amidst pure unpolluted streams, clean air and forests. The environment is what gives our lives a quality that cannot be bought, and they have preserved it this way. Their simple lifestyle is non-invasive. But now this basic and essential resource is being whittled away by big

companies that acquire huge swathes of virgin land for mining or ‘development’, leaving these people mute and destitute.

In the present climate, when we have already lost over half our natural resources, it is evident that principles like ‘the polluter pays’, ‘the precautionary principle’ or ‘sustainable development’ do not work any more- we are well past the point of precaution – and must be changed to stop further damage to resources that cannot be created by man.

*Instead, we must have a Nature’s Rights Commission made up of concerned citizens and scientists whose integrity is above any political and monetary affiliation. We only need a simple law that provides absolute protection to all valuable natural resources, be it forests, rivers, aquifers or lakes. The law could be a public trust doctrine, which has its basis in the ancient belief that Nature’s laws impose certain conditions on human conduct in its relationship with Nature. There is a precedent for this. The Israeli parliament- the Knesset – has set up the Israeli Commission for Future Generations as an inter-parliamentary entity. Its charter is to safeguard valuable natural heritage and natural resources. Its role is to oversee each legislative process, with special regard to long-term issues, and to prevent potentially damaging legislation from passage in the Knesset. This Commission has been given the authority to initiate bills that advance the interests of future generations. There is a historical precedent as well. Under Byzantine law, the concept of *jus gentium*, a law for all people and nations, was developed to protect Nature’s resources. Later, this led to the Public Trust*

Doctrine in the Magna Carta of the thirteenth century. More recently, the Water Framework Directive of the European Union recognises natural water resources as a protected heritage.”

In the same book article captioned “Under the Banyan Tree” written by Devdutt Pattanaik, the importance of trees under Indian Mythology has been explained as under :-

“Trees are sacred in India, and are often associated with a god or a goddess. Some Scholars believe that it is the tree that was worshipped first; perhaps for its medicinal or symbolic purpose, and that the gods and goddesses came later. That may be the case, but today, trees are an integral part of a deity’s symbolism. The mango tree, for example is associated with the Love God Kama, the tulsi plant is dear to Vishnu, bilva is associated with Shiva worship, blades of dhruva grass are offered to Ganesha, neem or margosa is sacred to the Mother Goddess, coconut and banana are associated with Lakshmi.

The banyan tree is associated with Yama, the God of Death, and the tree is often planted outside the village near crematoriums. It is believed to be the abode of ghosts. Vetalas and pisachas are supposed to hang from its many branches.

Indians knew that banyan tree as the vata vriksha. When the British came to India, they noticed that members of the trading or Bania community gathered under a large shady fig tree, which they named the banyan, from Bania. Technically, Ficus bengalensis, the banyan, belongs to the fig family. There are various types of fig trees all over the world and some of these are sacred. The most popular one is the Ficus

religiosa, or the peepul which became especially popular in the Buddhist times, because it was under this tree that Gautama Siddhartha of the Sakya clan attained enlightenment. It was the leaves of a fig tree that Adam and Eve used to cover their nakedness in Eden after they were tempted to eat the forbidden fruit by Satan.

The banyan tree does not let a blade of grass blow under it. Thus, it does not allow for any rebirth and renewal. While the banyan offers shade from the sun, it offers no food. That is why it is not part of fertility ceremonies like marriage and childbirth, where food-giving, rapidly renewing plants with a short lifespan such as banana, mango, coconut, betal, rice and even grass are included.

Marriage and rebirth are rites of passage; they represent major shifts in life. They are all about instability and flux; the banyan tree is the very opposite. It is stable and constant. It has a long lifespan, and hence seems immortal. Its roots descend from the branches and then anchor the tree to the ground, transforming into trunks eventually, so that decades later, it is difficult to distinguish root from stem.

Things that evolve the notion of immortality become auspicious in India; for example, the immortal mountain, the immortal sea, the immortal diamond and indestructible ash. This is because since ancient times, Indian seers were acutely aware of the transitory nature of things around us. Everything dies-every plant, every animal, even moments die; the present becomes the past in an instant. In an ever changing world, we seek constancy and permanence. The banyan tree is therefore worthy of veneration. It is evergreen and

shady, hence an eternal refuge for all creatures unable to bear the vagaries of life.

Thus it emerges that in Indian thought, there are two types of sacredness—one that is associated with impermanent material reality, and the other, which is associated with permanent spiritual reality. The banana and the coconut fit into the previous category; the banyan fits into the latter. Banana is the symbol of flesh, constantly dying and renewing itself. Banyan is the soul—never needing to renew itself. The banyan is the botanical equivalent of the hermit.

*Just as a hermit cannot raise a family, a banyan tree cannot support a household. It represents not the material aspiration of a people; it represents the spiritual aspiration. The banyan tree is said to be immortal; it is *akshaya*, that which survives *parlaya*, the destruction of the whole world.*

The Mahabharata tells the story of a woman called Savitri, who lost her husband as destined one year after her marriage near a banyan tree. She followed Yama to the land of the dead, and through determination and intelligence, managed to secure back her husband's life. In the memory of the event, Hindu women circle the banyan tree, tying seven stings around it. This is imitative magic; by symbolically going around the immortal tree, the women are binding immortality into their married lives. They are securing the lives of their husbands, the pillars of their households. They are protecting themselves from widowhood, which is believed by most Hindus to be the worst fate for a woman.

Under the banyan tree sat the sages of India – those who rejected the flesh and the material world and aspired for the soul alone. This was the favourite tree of the sadhu, the wandering hermit. The greatest of hermits, Shiva, was often represented in its shade as stone called the Lingam. Being an ascetic, Shiva was not part of the village; he was a hermit, not a householder; he did not fear ghosts and so was comfortable staying in the shade of this immortal, never dying, and never renewing plant.

In iconography, Shiva is visualized as Dakshinamurti, he who faces the South-South being the direction of death and change. He sits under the banyan tree, the botanical embodiment of the universal soul, facing the terror of death and change stoically, unafraid, because of his profound understanding of the world. At his feet sit sages who are recipients of Shiva's wisdom. In South Indian temples, Shiva's south facing form, under the banyan tree, is placed on the south facing wall of the temple. Like Shiva, Vishnu is also a form of God. But Vishnu is not associated with the banyan tree, perhaps because Vishnu is that aspect of God, which more associated with change. He goes with the flow- this attitude is called leela or playfulness- he does not fear change. Vishnu is therefore associated with the fragrant tulsi plant, or with flowering plants like champa and Kadamba. But there is one time when Vishnu is associated with the banyan tree. It is during the end of the world, when flood waters rise and dissolve all things. Sage Markandeya, who had a terrifying vision of this event, saw Vishnu as a baby lying on the leaf of banyan tree, cradled by the deadly waves. This

form of Vishnu is called Vatapatra-Shayin, he who rests on the banyan leaf. The image is rich in symbols; the whole world may seem transitory, like the waves of the ocean, but all life can renew itself, as a baby replaces the older generation, because divine grace represented by Vishnu is eternal, like a banyan leaf.”

Learned authors; T.S. Rana, Bhaskar Datt & R.R. Rao, in the article on Biodiversity in the Alpine Himalaya: Strategies for Conservation and Ecodevelopment which contained in High Altitudes of the Himalaya-II (Biodiversity, Ecology & Environment) have mentioned that the alpine zone in the Himalaya constitutes a unique habitat and has contributed to great biological diversity, particularly in the flora of India. In fact the alpine Himalayan Zone is a warehouse of biodiversity, botanical curiosity and valuable medicinal herbs. The conservation of its biodiversity particularly species which are in immediate danger of extinction is a great challenge for all conservation biologists of 21st century. The Himalayan chain consists of the complex system of three parallel ranges of tertiary mountains namely (i) Great Himalaya or Trans Himalaya (average elevation 6000m), (ii) Lesser Himalaya or Middle Himalaya (average elevation 4500m) and (iii) Outer Himalaya or Siwalik ranges (up to 1200m), rising between the Indian Peninsula and Central Asia as a young system of mountains stretching over nearly 3000 Km. almost from the borders of Afghanistan in the west to the north of Myanmar in the east with altitude ranging from few hundred to over 8000 m.

Learned authors have described the alpine zone, alpine forests, alpine scrubs, alpine meadows and Phytogeographical considerations are as under : -

The alpine zone

Alpine zone in the Himalaya is that section, which lies immediately above the tree line and below the snow line. Generally, the lower part of the alpine zone is a summer grazing ground, with meadows bright with alpine flowers and the upper parts have a high alpine flora with species adapted to withstand the extremes of cold and desiccation (Polunin & Stainton, 1984). As started above, on account of the wide ranging climatic conditions at different latitudes and altitudes of the Himalaya, the demarcation of the alpine zone by altitude alone in the entire Himalayan belt is not possible because variation in alpine flora depends on local environment.

The western Himalayan ranges differ from their eastern counterparts in greater breadth and length, higher latitude, scanty rainfall, heavy snowfall and cool, dry climate. This marked difference in the humidity and quality of vegetation in eastern and western Himalayan is evident by the fact that the tree line in the western Himalaya is ca 3600 m as compared to eastern Himalayan where the tree line extends to ca 4600 m. The eastern Himalaya is more evenly than the western Himalaya. The degree of precipitation is due to the abruptly rising hills that directly confront the moisture laden clouds blowing from the Bay of Bengal. The high humidity is conducive for the tree growth, and therefore, the timber line or the upper limit of tree zone goes up to 4600 m compared to 3600 m in western Himalaya. The vegetation of the alpine zone is normally devoid of any tree growth, except for the stunted bushes and shrubs scattered among the characteristic cushion-forming or matted plants and colourful herbs, most of which are seasonal.

Although the species composition in the alpine belt is more or less same in the entire Himalaya, the density and frequency of the species vary considerably in the eastern and western sectors. Also, certain species are strictly endemic either to the alpine belt as a whole or confined to western or eastern sectors. The alpine belt in the western sector is more dominant and composed of open rolling grassy meadows termed

as “bugyals” in Garhwal and Kumaon and “margs” in Kashmir.

The alpine vegetation is not very dense but is a store house of numerous colourful herbs many of them being valued medicinal plants like *Aconitum heterophyllum* (Atees), *A. ferox* (Bish), *Saussurea constus* (Kuth), *Dactylorhiza hatagirea* (Salam panja), *Ephedra gerardiana* (Somlata), *Gentiana kurroo* (Karu), *Picrorhiza kurrooa* (Kutki), *Nardostachys jatamansi* (Jatamansi), *Podophyllum hexandrum* (Papra), *Rheum emodi* (Dolu), *Berberis* spp. and others. The alpine vegetation of the Himalaya can be broadly discussed under:

1. Alpine forests

The alpine forests in the western Himalaya are dominated by *Betula utilis*, *Pinus wallichiana*, and *Rhododendron campanulatum*, which are all scattered and stunted. These forests are generally seen on rocks, ridges and other similar situations. The shrubby and herbaceous components of these forests are almost the same as noticed in the temperate zone. In the eastern sector, only dominant species is *Abies densa* associated with *Betula utilis* and rarely *Juniperus wallichiana*.

2. Alpine scrubs

Alpine scrubs are chiefly met with on rocks, ridges and stony slopes and generally appear above the tree limit and in similar habitats, ascending almost up to 4200 m. The chief shrubby components are *Berberis jaeschkeana*, *Myricaria elegans*, *Lonicera asperifolia*, *L. Hypoleuca*, *L. semenovii*, *L. spinosa*, *Salix flagellaris*, *S. lindleyana*, *S. pychnostachya*, *Rhododendron anthopogon*, *R. lepidotum*, *Juniperus indica*, *J. recurva* and *J. communis*. Areas where adequate water is available, the *Rhododendron* are frequently seen along with the species of *Berberis*, *Lonicera* and few others. In drier inner valleys, species like *Rosa webbiana*, *Cotoneaster pruinosis*, *C. microphyllus*, *C. gilgitensis*, *Caragana versicolor*, *C. brevifolia*, *C. gerardiana*

and *Cassiope fastigiata* and *Ephedra gerardiana* are common. The herbaceous elements among these alpine scrubs are species of *Artemisia*, *Astragalus*, *Androsace*, *Anemone*, *Aster*, *Gentiana*, *Geranium*, *Mysotis*, *Oxytropis*, *Potentilla*, *Ranunculus*, *Saxifraga*, *Sedum*, *Epilobium*, *Eritrichium*, *Primula*, *Thalictrum* and several members of *Brassicaceae* and *Poaceae*.

3. Alpine meadows

The alpine meadows or alpine pastures the most fascinating areas which support unique plant species. These alpine meadows form a lush carpet in some localities and are the picturesque beauty of high lofty snow peaks. Such typical alpine meadows can be found in the "Valley of Flowers", Bishtola, Baidni, Bajmora, Lakshmiban (Garhwal) and Joharpatti (Kumaon) in the western sectors. Typical alpine meadows are not common in east Himalaya.

In the eastern sector, the alpine meadows are confined only to small pockets on hill tops surrounded by dense vegetation as one can find in Arunachal Pradesh and Sikkim. At certain places the meadows are replaced by glacial moraines, which also possess a similar type of floristic composition. Most of the alpine herbs have annual aerial parts, but perennial underground rhizomes, rootstocks and stems covered and protected by layers of leaf-bushes and scales. The distribution pattern of these alpine meadows is largely determined by the local edaphic and climatic conditions. The common herbaceous elements of the alpine meadows are *Aconitum violaceum*, *Adonis aestivalis*, *himalaica*, *Arabis tibetica*, *Arnebia euchroma*, *Artemisia gmelinii*, *Aster flaccidus*, var. *maximowiczii*, *Delphinium brunonianum*, *D. vestitum*, *Dracocephalum heterophyllum*, *Erigeron multiradiatus*, *Gernium collinum*, *Lagotis cashmiriana*, *L. kunawurensis*, *Lomatogonium carinthiacum*, *Oxygraphis endlicheri*, *Picrorhiza kurrooa*, *Rheum spiciforme*, *Stellaria cherleriae*, *Swertia petiolata*, *Tanacetum himachalensis*, *Thalictrum alpinum*, *Trachydium roylei*, *Trollius acaulis*, *Waldheimia glabra*, *W. tomentosa* and species of *Juncus*, *Lactuca*, *Pedicularis*, *Polygonum*, *Potentilla*, *Primula*,

Ranunculus, Rhodiola, Saxifraga, Saussurea and Senecio. Most of the alpine plants have very colourful flowers much larger in size compared to the size of the plant. This could be one of the adaptations for ensuring the insect pollination, where the insect population is scarce.

Grasses and sedges are also common in the alpine meadows, the prominent of these are Bromus gracillimus, B. inermis, Carex cruenta, C. infusate, C. nivalis, C. obscura, Dactylis glomerata, Elymus nutans, Festuca kashmiriana, Kobresia pamiroalaica, K. pygmaea, Pennisetum lanatum, Phleum alpinum, Poa alpine, P. tibetica, Trisetum spicatum, etc.

The alpine marshes, along banks and similar marshy habitats support a number of characteristic marshy plants such as Pinguicula alpine, Juncus leucomelas, Caltha palustris and various colourful species of Primula, Corydalis, Pedicularis and Polygonum.

At the higher limits of alpine zone which are exposed to severe cold, only characteristic cushion-forming species typical of cold desert are found. Some such species form soft cushion e.g. species of Androsace, Draba, Saxifraga, Sedum and Paraquilegia, while other species like Acantholimon, Arenaria, Coaragana, Astragalus and Thylacospermum are rigid mat forming. The most curious of alpine flowering plants are the woolly species of Asteraceae e.g. Saussurea gossypiphora, S. obvallata, S. simpsoniana, S. graminifolia, Soroseris glomerata and species of Tussilago and Leontopodium. Saussurea gossypiphora and S. graminifolia commonly referred to as "Snow ball" plants are unique alpine species which look like snow ball due to the dense, white hairs which cover the entire plant and protect from severe cold wind and snow and maintains warmth inside the head even if outside temperature falls. The pollination biology of these species form a very interesting strategy. Bees' and flies take shelter in the warmth and at the same time pollinate the flowers. There is yet another interesting group of 'hot house' plants like Rheum nobile and Saussurea obvallata which have their inflorescences sheltered by leafy bracts that can

be compared to glasses of a 'hot house'. The flower open inside the bracts, where insects also take shelter for warmth and at the same time pollinate the flower.

Phytogeographical considerations

The Himalaya defines the geographical boundary of India in the north and also influences the monsoon rainfall and the climate of India as a whole. The Himalayan uplift contributed to the shaping of the biogeographical characters of India (Mani, 1978). It is presumed that the Himalayan mountains had their own flora even before the Pleistocene epoch. The intermittent warm periods during the Himalayan glaciations to some extent protected the species from total extinction. The glaciations did not affect much the foothills with result the vegetation of the lower belt was not altered. Migration of floras through new corridors of mountain chains, survival of relicts, adaptive radiation of species complexes in new ecological niches, evolution of new species by an intermixing of different flora and by mutation had a role in determining the present day composition and distribution of alpine flora (Rau, 1975).

The Himalaya forms the southern fringe of palaeartic Realm. The alpine zone represents the Turkemenian subregion in the west and Manchurian (Siberian-Mongolian) subregion in the extreme east. Good (1964) placed the Himalaya under the Sino- Himalayan, Tibetan mountain province of the Sino-Japanese region of Boreal Kingdom. Gaussen (1933) and many other considered Himalaya as a sort of phytogeographic barrier for many of the Asiatic elements. Mani (1978) considered the defile of the river Sutlej being the landmark in the Himalayan biogeography. He presented a gradual transition from east to west sector of the Himalaya. The geologic welding of Gondwana and Asiatic landmass led to the exchange of flora and fauna resulting in the biogeographic complexity. The flora of the Tertiary mountains of south China, Indo-China, Thailand and Malaya intruded westward, along the rising Himalaya. The continued uplift of the Himalaya has led to evolution of lowland

steppe elements into temperate and alpine forms of Turkemenian subregion.

A study of the alpine flora of western Himalaya shows that a large number of species like Nepeta tibetica, Elsholtzia densa, Rimula tibetica, P. ellitica, Onosma hispidus, Tanacetum fruticulosum of the lower alpine belt in the Garhwal-Kumaon sector and eastwards appear to have come from Tibet, W. China and adjoining northeast Asia. The northwestern sector of the Himalaya has been subjected to considerable influence from the adjoining floristically rich areas of Karakoram, Pamir and further north in the Tien Shan range of mountains. Some species of these regions which are today common in N.W. Himalaya are Arctium lappa, Thalictrum alpinum, Astragalus coluteocarpus, Sibbaldia cuneata, Bupleurum falcate var. gracillimum and species of Potentilla, Geranium, Nepeta, Thermopsis, Danthonia, Rosa, Galium, Draba, Cousinia, Lagotis, Silene, Saussurea, Taraxacum, Perovskia, Fritillaria, Oxygraphis etc., Stern (1960) considered similarity of Himalayan flora with those of China. Chinese mountains being much older than Himalaya have contributed to the present day Himalayan flora. His studies have revealed various possibilities regarding the entry of floristic elements into the alpine Himalaya from the north, west and east Asia. In the eastern Himalaya a large number of elements intrude from Indo-China subregion while some Malayan elements are also visible. According to Ohba (1988) it is quite probable that the Himalayan flora had open intercourse with those of the arctic region via the east and west margins of the highland, particularly in ages of climatic fluctuation. According to him the "Central Asiatic Corridor" favours an important pass for the migration of the flora between the arctic regions and the Himalaya as well as E. Tibet and S. W. China. The floristic connection of the Himalaya through this corridor is supported by the distribution pattern and the presence of common or corresponding species with arctic region. Such species are Acantholimon lycopodioides, Eremurus himalaicus, Physochlaina praealta, Caragana versicolor, C. brevifolia, Nepeta supine, Epilobium

latifolium, *Minuartia biflora* and *Saxifraga oppositifolia*.

A number of European or Eurasian elements have got introduced through the human influences. These are *Cerastium glomeratum*, *Thlaspi arvensis*, *Achillea millefolium*, *Verbascum thapsus*, *Juncus bufonicus*, *J. articulatus*, *Geranium pusillum*, etc. It is also assumed that the ancestors of some of the species which have only a scattered distribution at present may have flourished extensively during the major Himalayan uplift but later, due to competition or other adverse climatic conditions, most of them might have perished leaving behind only scattered distribution. While some of the species like *Thlaspi andersonii*, *Chorispora sabulosa*, *Beibersteinia odora*, *Chritolea himalayensis*, *Heracleum thomsonii*, *Cremanthodium nanum* and others have a restricted distribution being found only in western Himalaya or in adjacent Tibet, there are others like, *Thalictrum alpinum*, *Ranunculus hyperboreus*, *R. pygmaeus*, *Potentilla multifida*, *Saxifraga flagellaris*, *Sedum rosea*, *Oxyria digyna*, *Triglochin palustre* and several others which enjoy a world – wide distribution in both the alpine and arctic locations. Some species like *Thylacospermum rupifragum*, *Cicer soongaricum*, *Physochlaina praealta*, and *Lamium rhomboideum* extend northwards to the central Asian highlands. *Senecio coronopifolius*, *Nepeta supina* and a few others are distributed westwards to Afghanistan, Iran and the Caucasus. There are many species distributed all along the Himalaya from west to east. *Gueldenstaedtia himalaica*, *Astragalus strictus*, *Saussurea leontodontoides*, *Cicerbita macrorhiza*, *Picrorhiza kurrooa* and other are in this category. *Aletris pauciflora*, *Anemone rupicola*

and *A. vitifolia* are among the species which are found in west China and also throughout the Himalaya as far as west of Kashmir.

Endemism

The Himalayan mountains are one of the active centres of endemic species. Although there is no correct assessment of the endemic flora in the alpine zone, one can fairly guess that ca 50% of the endemic plants of the Himalaya occur in the alpine or subalpine zones. The high rate of endemism in the alpine zone, particularly in largest and diversified genera is quite remarkable and is an indication of active evolution (speciation) as well as considerable degree of isolation. It is observed that majority of these endemics are neoendemics of apparently recent origin with close relatives in the alpine zone itself, in the lowland vegetation of the Himalaya and also in the region around the central Asiatic highland (Ohba, 1988).

Learned authors have also highlighted about endangered species and their conservation which is as under:-

Endangered species and their conservation

Although a number of alpine species have high adaptive value and can successfully survive and multiply in prevailing adverse ecological conditions, some species perhaps because of low level of genetic diversity in them, are unable to survive the competition with other vegetation. Such species have become endangered. In other words, the endangered species are those whose reproductive capacity is far lower than the number of plants eliminated from the habitat due to natural or anthropogenic factors. This consequently leads to the decline in number and size of populations. Although species disappearance attracts wide publicity and attention, the loss of genetic diversity due to extinction of population is least studied. The decrease in the size and number of populations under a given species has deleterious effect on their breeding structure, genetic and evolutionary dynamics, all of which form the focal point o

concern in conservation biology (Falk & Horsinger, 1991; Harper, 1977; Barret & Kohn, 1991, Karron, 1991). In small and isolated populations, genetic drift operates and this results in the loss of variations which ultimately reduces the ability of populations to adapt to changing environmental conditions and to increase their susceptibility against pests and diseases and are thus prone to extinction (Hamilton, 1982).

To decide a species as endangered is not an easy talk, but requires very elaborate field assessments. Customarily, if a species is not represented by more collections from different localities in a herbarium, such a species is determined as rare and this may not always be correct. Sometimes if a species is collected after a gap of 25 to 50 years or more than also it is concluded as an endangered species. While partly it could be true, certain ephemeral species such as species of *Thermopsis*, *Primula*, *Saxifraga*, *Sedum*, *Gentiana* etc., complete their life cycle in a short period and die off, likely to be missed by botanists exploring the area. Hence, not collecting a plant for several decades may not always conclude in species as endangered.

All the endangered plants are certainly rare but not all rare plants are endangered. For example several sparsely distributed alpine plants like some species of *Saussurea*, *Impatiens*, *Primula*, *Corydalis*, *Thalictrum*, *Saxifraga*, etc. have developed ecological adaptations to persistence in small populations showing natural rarity and are genetically stable. On other hand, there are some rare species which were supposed to be widespread at one time have now undergone a rapid decline due to anthropogenic factors (anthropogenic rarity), for example *Aconitum heterophyllum*, *Dactylorhiza hatagirea*, *Alpinia galangal*, *Coptis teeta*, *Nardostachys grandiflora*, *Podophyllum hexandrum*, *Panax pseudo-ginseng*, *Picrorhiza kurrooa*, *Dioscorea deltoidea*, *Angelica glauca*, *Allium stracheyi*, etc. These aspects require very extensive field investigations before one can decide a species endangered or not. According to the minimum viable population concept (Schaffer, 1981) a minimum of 50 individuals are recommended for maintenance of

the population. A species with less than 50 individuals is certainly critically endangered.

*In the Himalaya, due to natural (such as landslides, glaciations, earthquakes, lack of pollination and regeneration etc.) and man-made (such as over-exploitation, destruction of habitats, etc.) factors the alpine bioresources are under varying degrees of threat. It is no wonder that today many of the valuable plants like *Podophyllum hexandrum*, *Nardostachys grandiflora*, *Aconitum spp.*, *Picrorhiza kurroo*, *Saussurea lappa* and *Dactylorhiza hatagirea* are not found in large populations in their natural habitats. Once the species gets fragmented and the demography of the population is altered, the genetic diversity that is essential for sustaining the species also get eroded. Steps should, therefore, be taken to ensure that their genetic diversity is not lost.*

Conservation and management of an endangered species requires rather very extensive and frequent field surveys throughout the distribution range of a particular species, which is certainly time consuming, expensive and difficult. A large number of species so far listed from the alpine zone of the Himalaya are based on the scrutiny of herbaria. Therefore, what is urgently required is the assessment of status of individual species in its natural habitat.

*For long term conservation and management of any species, its genetics and demography i.e. population dynamics is crucial. In case of *Eremostachys superb* the solitary population near Mohand in Siwaliks of Uttar Pradesh is so small and isolated. A strong genetic drift has set in and this results in loss and variation in the species. Another consequence of low population structure is the occurrence of inbreeding resulting in loss of fitness (inbreeding depression). Therefore, we have to think of strategies that increase the genetic diversity in rare species – say bringing together geographically isolated populations. This again requires extensive surveys to find out the distribution of various populations of a given endangered species. The reproductive biology of endangered species is another aspect of study which is almost neglected. Preservation of the*

habitat alone as attempted in most cases may not ensure the long term conservation of endangered species.

In situ conservation is the best method for protecting the delicate populations of endangered species. In a situation where several endangered species grow within a few hectare or sq km the whole area should be protected. The occurrence of several endemic species in a particular area also indicates the potential of that area as a centre of speciation and evolution. Furthermore, when an endangered species grows in pure population of fewer or more individuals or in association with other vegetation, it is necessary to establish a sanctuary for the individual species as for e.g. Rhododendron sanctuary in Sikkim.

Wide publicity regarding the critical nature of the species among the local people is also necessary. The local people should be involved in every effort of conserving species in its habitat.

The Botanical Survey of India has listed 625 species in the three 'Red Data Books' (Nayar & Sastry, 1987 1988 & 1990). Nearly 214 species of flowering plants of the Himalaya (including alpine zones) are endangered. Out of them nearly 37 need priority attention. Most of them are in commerce as herbal drugs of repute. The monitoring of these species in the Himalayan region is not yet attempted. This involves the study of populations during different seasons over a period of time for finding out the adaptive ability of a particular species to its natural habitat. Where required, overgrowth of other surrounding species need to be controlled to keep the population of endangered species to a level that is can sustain itself. As collection of certain endangered species with high medicinal value offers economic subsistence to the inhabitants of the Himalaya, there is an urgent need to mass multiply them through seeds, clonal propagation and tissue culture, so that biodiversity of the region is not diminished.

The UN Conference on the Human Environment was held from 5 to 16 June, 1972 at Stockholm. It was convened pursuant to UN General Assembly Resolution 2398 of 3 December, 1968, on a proposal from Sweden. Delegates from 113 States attended the Conference, representing most

of the UN membership with the exception of the USSR. Stockholm Declaration of the United Nations Conference on the Human Environment contained book titles as ‘Documents in International Environmental Law, Second Edition’ reads as under :-

“ Proclaims that :

1. Man is both creature and moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth. In the long and tortuous evolution of the human race on this planet a stage has been reached when, through the rapid acceleration of science and technology, man has acquired the power to transform his environment in countless ways and on an unprecedented scale. Both aspects of man’s environments, the natural and the man-made, are essential to his well being and to the enjoyment of basic human rights – even the right to life itself.

2. The protection and improvement of the human environment is a major issue, which affects the well-being of peoples and economic development throughout the world; it is the urgent desire of the peoples of the whole world and the duty of all Governments.

3. Man has constantly to sum up experience and to on discovering, inventing, creating and advancing. In our time, man’s capability to transform his surroundings, if used wisely, can bring to all peoples the benefits of development and the opportunity to enhance the quality of lie. Wrongly or heedlessly applied, the same power can do incalculable harm to human beings and the human environment. We see around us growing evidence of man-made harm in many regions of the earth: dangerous levels of pollution in water, air, earth and living beings; manor and undesirable disturbances to the ecological balance of the biosphere; destruction and depletion of irreplaceable resources; and gross deficiencies, harmful to the physical, mental and social health of man, in the man-made

environment, particularly in the living and working environment.

4. In the developing countries most of the environmental problems are caused by under-development. Millions continue to live far below the minimum levels required for a decent human existence, deprived of adequate food and clothing, shelter and education, health and sanitation. Therefore, the developing countries must direct their efforts to development, bearing in mind their priorities and the need to safeguard and improve the environment. For the same purpose, the industrialized countries should make efforts to reduce the gap between themselves and the developing countries. In the industrialized countries, environment problems are generally related to industrialization and technological development.

5. The natural growth of population continuously presents problems for the preservation of the environment, and adequate policies and measure should be adopted, as appropriate, to face these problems. Of all things in the world, people are the most precious. It is the people that propel social progress, create social wealth, develop science and technology and, through their hard work, continuously transform the human environment. Along with social progress and the advance of production, science and technology, the capability of man to improve the environment increases with each passing day.

6. A point has been reached in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences. Through ignorance or indifference we can do massive and irreversible harm to the earthly environment on which our life and well being depend. Conversely, through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes. There are broad vistas for the enhancement of environmental quality and the creation of a good life. What is needed is an enthusiastic but calm state of mind and

intense but orderly work. For the purpose of attaining freedom in the world of nature, man must use knowledge to build, in collaboration with nature, a better environment. To defend and improve the human environment for present and future generations has become an imperative goal for mankind—a goal to be pursued together with, and in harmony with, the established and fundamental goals of peace and of worldwide economic and social development.

7. To achieve this environmental goal will demand the acceptance of responsibility by citizens and communities and by enterprises and institutions at every level, all sharing equitably in common efforts. Individuals in all walks of life as well as organizations in many fields, by their values and the sum of their actions, will shape the world environment of the future. Local and national governments will bear the greatest burden for large-scale environmental policy and action within their jurisdictions. International cooperation is also needed in order to raise resources to support the developing countries in carrying out their responsibilities in this field. A growing class of environmental problems, because they are regional or global in extent or because they affect the common international realm, will require extensive cooperation among nations and action by international organizations in the common interest. The Conference call upon Governments and peoples to exert common efforts for the preservation and improvement of the human environment, for the benefit of all the people and for their posterity.

II

Principles

States the common conviction that:

Principle 1

Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well being, and he bears a solemn responsibility to protect and improve the environment for present and future

generations. In this respect, policies promoting or perpetuating apartheid, racial segregation, discrimination, colonial and other forms of oppression and foreign domination stand condemned and must be eliminated.

Principle 2

The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.

Principle 3

The capacity of the earth to produce vital renewable resources must be maintained and, wherever practicable, restored or improved.

Principle 4

Man has a special responsibility to safeguard and wisely manage the heritage of wildlife and its habitat, which are now gravely imperiled by a combination of adverse factors. Nature conservation, including wildlife, must therefore receive importance in planning for economic development.

Principle 5

The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind.

Principle 6

The discharge of toxic substances or of other substance and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems. The just struggle of the peoples of ill countries against pollution should be supported.

Principle 7

States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Principle 8

Economic and social development is essential for ensuring a favorable living and working environment for man and for creating conditions on earth that are necessary for the improvement of the quality of life.

Principle 9

Environmental deficiencies generated by the conditions of underdevelopment and natural disasters pose grave problems and can best be remedied by accelerated development through the transfer of substantial quantities of financial and technological assistance as a supplement to the domestic effort of the developing countries and such timely assistance as may be required.

Principle 10

For the developing countries, stability of prices and adequate earnings for primary commodities and raw materials are essential to environmental management, since economic factors as well as ecological processes must be taken into account.

Principle 11

The environmental policies of all States should enhance and not adversely affect the present or future development potential of developing countries, nor should they hamper the attainment of better living conditions for all, and appropriate steps should be taken by States and international organizations with a view to reaching agreement on meeting the possible national and international economic consequences resulting from the application of environmental measures.

Principle 12

Resources should be made available to preserve and improve the environment, taking into account the circumstances and particular requirements of developing countries and any costs which may emanate from their incorporating environment safeguards into their development planning and the need for making available to them, upon their request, additional international technical and financial assistance for this purpose.

Principle 13

In order to achieve a more rational management of resources and thus to improve the environment, States should adopt an integrated and coordinated approach to their development planning so as to ensure that development is compatible with the need to protect and improve environment for the benefit of their population.

Principle 14

Rational planning constitutes an essential tool for reconciling any conflict between the needs of development and the need to protect and improve the environment.

Principle 15

Planning must be applied to human settlements and urbanization with a view to avoiding adverse effects on the environment and obtaining maximum social, economic and environmental benefits for all. In this respect projects which are designed for colonialist and racist domination must be abandoned.

Principle 16

Demographic policies which are without prejudice to basic human rights and which are deemed appropriate by Governments concerned should be applied in those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects on the environment or development, or where low population density may prevent improvement of the human environment and impede development.

Principle 17

Appropriate national institutions must be entrusted with the task of planning, managing or controlling the environmental resources of States with a view to enhancing environmental quality.

Principle 18

Science and technology, as part their contribution to economic and social development, must be applied to the identification, avoidance and control of environmental risks and the solution of environmental problems and for the common good of mankind.

Principle 19

Education in environmental matters, for the younger generations as well as adults, giving due consideration to the underprivileged, is essential in order to broaden the basis for an enlightened opinion and responsible conduct by individuals, enterprises and communities in protecting and improving the environment in its full human dimension. It is also essential that mass media of communications avoid contributing to the deterioration of the environment, but, on the contrary, disseminate information of an educational nature on the need to protect and improve the environment in order to enable man to developing every respect.

Principle 20

Scientific research and development in the context of environmental problems, both national and multinational, must be promoted in all countries, especially the developing countries. In this connection, the free flow of up-to-date scientific information and transfer of experience must be supported and assisted, to facilitate the solution of environmental problems; environmental technologies should be made available to developing countries on terms which would encourage their wide dissemination without constituting an economic burden on the developing countries.

Principle 21

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 22

States shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction.

Principle 23

Without prejudice to such criteria as may be agreed upon by the international community, or to standards which will have to be determined nationally, it will be essential in all cases to consider the systems of values prevailing in each country, and the extent of the applicability of standards which are valid for the most advanced countries but which may be inappropriate and of unwarranted social cost for the developing countries.

Principle 24

International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big or small, on an equal footing. Co-operation through multilateral or bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.

Principle 25

States shall ensure that international organizations play a coordinated, efficient and

dynamic role for the protection and improvement of the environment.

Principle 26

Man and his environment must be spared the effects of nuclear weapons and all other means of mass destruction. States must strive to reach prompt agreement, in the relevant international organs, on the elimination and complete destruction of such weapons.

The world charter for Nature sought to have its guiding principles given effect through National legislation and international practice. These principles include respect for nature, safeguarding of habitats necessary to maintain sufficient population levels for the survival of all life forms, protection of unique areas, representative samples of all ecosystems and of habitats of rare or endangered species.

UN General Assembly Resolution 37/7 passed on a World Charter for Nature, 28.10.1982 reads as under :-

“Annex

*World Charter for Nature**

The General Assembly,

Reaffirming the fundamental purposes of the United Nations, in particular the maintenance of international peace and security, the development of friendly relations among nations and the achievement of international co-operation in solving international problems of an economic, social, cultural, technical, intellectual or humanitarian character,

Aware that:

- (a) Mankind is a part of nature, and life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients,*
- (b) Civilization is rooted in nature, which has shaped human culture and influenced all artistic and scientific achievement, and living*

in harmony with nature gives man the best opportunities for the development of his creativity, and for rest and recreation,

Convinced that:

- (a) Every form of life is unique, warranting respect regardless of its worth to man, and to accord other organisms such recognition, man must be guided by a moral code of action,*
- (b) Man can alter nature and exhaust natural resources by his action or its consequences and, therefore, must fully recognize the urgency of maintaining the stability and quality of nature and of conserving natural resources.*

Persuaded that:

- (a) Lasting benefits from nature depend upon the maintenance of essential ecological processes and life support systems, and upon the diversity of life forms, which are jeopardized through excessive exploitation and habitat destruction by man,*
- (b) The degradation of natural systems owing to excessive consumption and misuse of natural resources, as well as to failure to establish an appropriate economic order among peoples and among States, leads to the breakdown of the economic, social and political framework of civilization,*
- (c) Competition for scarce resources creates conflicts, whereas the conservation of nature and natural resources contributes to justice and the maintenance of peace and cannot be achieved until mankind learns to live in peace and to forsake war and armaments,*

Reaffirming that man must acquire the knowledge to maintain and enhance his ability to use natural resources in manner which ensures the preservation of the species and ecosystems for the benefit of present and future generations,

Firmly convinced of the need for appropriate measures, at the national and international, individual and collective, and private and public levels, to protect nature and promote international co-operation in this field,

Adopts, to these ends, the present World Charter for Nature, which proclaims the following principles of conservation by which all human conduct affecting nature is to be guided and judged.

I. General principles

1. Nature shall be respected and its essential processes shall not be impaired.

2. The genetic viability on the earth shall not be compromised; the population levels of all life forms, wild and domesticated, must be at least sufficient for their survival, and to this end necessary habitats shall be safeguarded.

3. All areas of the earth, both land and sea, shall be subject to these principles of conservation; special protection shall be given to unique areas, to representative samples of the different types of ecosystems and to the habitats of rare or endangered species.

4. Ecosystems and organisms, as well as the land, marine and atmospheric resource that are utilized by man, shall be managed to achieve and maintain optimum sustainable productivity, but not in such a way as to endanger the integrity of those other ecosystems or species with which they coexist.

5. Nature shall be secured against degradation caused by warfare or other hostile activities.

II. Functions

6. In the decision-making process it shall be recognized that man's needs can be met only by ensuring the proper functioning of natural systems and by respecting the principles set forth in the present Charter.

7. In the planning and implementation of social and economic development activities, due account shall be taken of the fact that the conservation of nature is an integral part of those activities.

8. In formulating long-term plans for economic development, population growth and the improvement of standards of living, due account shall be taken of the long-term capacity of natural systems to ensure the subsistence and settlement of

the populations concerned, recognizing that this capacity may be enhanced through science and technology.

9. The allocation of areas of the earth to various uses shall be planned, and due account shall be taken of the physical constraints, the biological productivity and diversity and the natural beauty of the areas concerned.

10. Natural resources shall not be wasted, but used with a restraint appropriate to the principles set forth in the present Charter, in accordance with the following rules:

(a) Living resources shall not be utilized in excess of their natural capacity for regeneration;

(b) The productivity of soils shall be maintained or enhanced through measures which safeguard their long-term fertility and the process of organic decomposition, and prevent erosion and all other forms of degradations;

(c) Resources, including water, which are not consumed as they are used shall be reused or recycled;

(d) Non-renewable resources which are consumed as they are used shall be exploited with restraint, taking into account their abundance, the rational possibilities of converting them for consumption, and the compatibility of their exploitation with the functioning of natural systems.

11. Activities which might have an impact on nature shall be controlled, and the best available technologies that minimize significant risks to nature or other adverse effects shall be used; in particular:

(a) Activities which are likely to cause irreversible damage to nature shall be avoided;

(b) Activities which are likely to pose a significant risk to nature shall be preceded by an exhaustive examination, their proponents shall demonstrate that expected benefits outweigh potential damage to nature, and where potential adverse effects are not fully understood, the activities should not proceed;

- (c) Activities which may disturb nature shall be preceded by assessment of their consequences, and environmental impact studies of development projects shall be conducted sufficiently in advance, and if they are to be undertaken, such activities shall be planned and carried out so as to minimize potential adverse effects;*
- (d) Agriculture, grazing, forestry and fisheries practices shall be adapted to the natural characteristics and constraints of given areas;*
- (e) Areas degraded by human activities shall be rehabilitated for purposes in accord with their natural potential and compatible with the well-being of affected populations.*

12. Discharge of pollutants into natural systems shall be avoided and:

- (a) Where this is not feasible, such pollutants shall be treated at the source, using the best practicable means available;*
- (b) Special precautions shall be taken to prevent discharge of radioactive or toxic wastes.*

13. Measures intended to prevent, control or limit natural disasters, infestations and diseases shall be specifically directed to the causes of these scourges and shall avoid adverse side-effects on nature.”

United Nations Conference on Environment and Development also known as Rio de Janeiro Declaration or Earth Summit was held in the year 1992. The Rio Declaration comprises 27 principles which set out the basis upon which states and people are to co-operate and further develop international law in the field of sustainable development. Declaration reads as under :-

Preamble

The United Nations Conference on Environment and Development,

Having met at Rio de Janeiro from 3 to 14 June 1992,

Reaffirming the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972, and seeking to build upon it, with the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people,

Working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system,

Recognizing the integral and interdependent nature of the Earth, our home, Proclaims that:

Principle 1

Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Principle 2

States have, in accordance with the Charter of the United National and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 3

The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4

In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.

Principle 5

All States and all people shall cooperate in the essential task of eradication poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.

Principle 6

The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.

Principle 7

States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.

Principle 8

To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.

Principle 9

States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific

understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.

Principle 10

Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.

Principle 11

States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and development context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.

Principle 12

States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

Principle 13

States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.

Principle 14

States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.

Principle 15

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 16

National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

Principle 17

Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.

Principle 18

States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.

Principle 19

States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.

Principle 20

Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

Principle 21

The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.

Principle 22

Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Principle 23

The environment and natural resources of people under oppression, domination and occupation shall be protected.

Principle 24

Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and

cooperate in its further development, as necessary.

Principle 25

Peace, development and environmental protection are interdependent and indivisible.

Principle 26

States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United National.

Principle 27

States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

The Article 2 of the Kyoto Declaration made in December, 1997, reads as under :-

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;

(iii) Promotion of sustainable forms of agriculture in light of climate change considerations;

(iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;

(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol;

(vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

(viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy.”

The convention on International Trade in Endangered Species of Wild Fauna and Flora was held on 03.03.1973 to recognize that international co-operation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade. The articles on convention on International Trade in Endangered Species of Wild Fauna and Flora contained in the

book titled as “Documents in International Environmental Law which read as under :-

**“Convention on International Trade in
Endangered Species of**

Wild Fauna and Flora

The Contracting States,

Recognizing that wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural systems of the earth which must be protected for this and the generations to come;

Conscious of the ever-growing value of wild fauna and flora from aesthetic, scientific, cultural, recreational and economic points of view;

Recognizing that peoples and States are and should be the best protectors of their own wild fauna and flora;

Recognizing, in addition, that international co-operation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade;

Convinced of the urgency of taking appropriate measures to this end;

Have agreed as follows:

Article I

Definitions

For the purpose of the present Convention, unless the context otherwise requires:

(a) ‘Species’ means any species subspecies, or geographically separate population thereof;

(b) ‘Specimen’ means:

(i) any animal or plant, whether alive or dead;

(ii) in the case of an animal: for species included in Appendices I and II, any readily recognizable part or derivative thereof; and for species included in Appendix III, in relation to the species; and

- (iii) *in the case of a plant: for species included in Appendix I, and readily recognizable part or derivative thereof; and for species included in Appendices II and III, any readily recognizable part or derivative thereof specified in Appendices II and III in relation to the species;*
- (c) *'Trade' means export, re-export, import and introduction from the sea;*
- (d) *'Re-export' means export of any specimen that has previously been imported;*
- (e) *'Introduction from the sea' means transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State;*
- (f) *'Scientific Authority' means a national scientific authority designated in accordance with Article IX;*
- (g) *'Management Authority' means a national management authority designated in accordance with Article IX;*
- (h) *'Party' means a State for which the present Convention has entered into force.*

Article II

Fundamental principles

1. *Appendix I shall include all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances.*

2. *Appendix II shall include:*

- (a) *all species which although not necessarily now threatened with extinction may become so unless trade in specimens of such species is subject to strict regulation in order to avoid utilization incompatible with their survival; and*
- (b) *other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) of this paragraph may be brought under effective control.*

3. *Appendix II shall include all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or*

restricting exploitation, and as needing the co-operation of other Parties in the control of trade.

4. The Parties shall not allow trade in specimens of species included in Appendices I, II and III except in accordance with the provisions of the present Convention.

Article III

Regulation of trade in specimens of species included in Appendix I

1. All trade in specimens of species included in Appendix I shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix I shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;

(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora;

(c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment; and

(d) a Management Authority of the State of export is satisfied that an import permit has been granted for the specimen.

3. The import of any specimen of a species included in Appendix I shall require the prior grant and presentation of an import permit and either an export permit or a re-export certificate. An import permit shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of import has advised that the import will be for purposes which are not detrimental to the survival of the species involved;

(b) a Scientific Authority of the State of import is satisfied that the proposed recipient of a living specimen is suitably equipped to house and care for it; and

(c) a Management Authority of the State of import is satisfied that the specimen is not to be used for primarily commercial purposes.

4. The re-export of any specimen of a species included in Appendix I shall require the prior grant and presentation of a re-export certificate. A re-export certificate shall only be granted when the following conditions have been met:

(a) a Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with the provisions of the present Convention;

(b) a Management Authority of the State of re-export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment; and

(c) a Management Authority of the State of re-export is satisfied that an import permit has been granted for any living specimen.

5. The introduction from the sea of any specimen of a species included in Appendix I shall require the prior grant of a certificate from a Management Authority of the State of introduction. A certificate shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of introduction advises that the introduction will not be detrimental to the survival of the species involved;

(b) a Management Authority of the State of introduction is satisfied that the proposed recipient of a living specimen is suitably equipped to house and care for it; and

(c) a Management Authority of the State of introduction is satisfied that the specimen is not to be used for primarily commercial purposes.

Article IV

Regulation of trade in specimens of species included in Appendix II

1. All trade in specimens of species included in Appendix II shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species:

(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and

(c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

3. A Scientific Authority in each Party shall monitor both the export permits granted by that State for specimens of species included in Appendix II and the actual exports of such specimens. Whenever a Scientific Authority determines that the export of specimens of any such species should be limited in order to maintain that species throughout its range at a level consistent with its role in the ecosystems in which it occurs and well above the level at which that species might become eligible for inclusion in Appendix I, the Scientific Authority shall advise the appropriate Management Authority of suitable measures to be taken to limit the grant of export permits for specimens of that species.

4. The import of any specimen of a species included in Appendix II shall require the prior presentation of either an export permit or a re-export certificate.

5. The re-export of any specimen of a species included in Appendix II shall require the prior grant and presentation of a re-export certificate. A re-export certificate shall only be granted when the following conditions have been met:

(a) a Management Authority of the State of re-export is satisfied that the specimen was imported into that State in accordance with the provisions of the present Convention; and

(b) a Management Authority of the State of re-export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

6. The introduction from the sea of any specimen of a species included in Appendix II shall require the prior grant of a certificate from a Management Authority of the State of introduction. A certificate shall only be granted when the following conditions have been met:

(a) a Scientific Authority of the State of introduction advises that the introduction will not be detrimental to the survival of the species involved; and

(b) a Management Authority of the State of introduction is satisfied that any living specimen will be so handled as to minimize the risk of injury, damage to health or cruel treatment.

7. Certificates referred to in paragraph 6 of this Article may be granted on the advice of a Scientific Authority, in consultation with other national scientific authorities or, when appropriate, international scientific authorities, in respect of periods not exceeding one year for total numbers of specimens to be introduced such periods.

Article V

Regulation of trade in specimens of species included in Appendix III

1. All trade in specimens of species included in Appendix II shall be in accordance with the provisions of this Article.

2. The export of any specimen of a species included in Appendix III from any State which has included that species in Appendix III shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met:

(a) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and

(b) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

3. *The import of any specimen of a species included in Appendix III shall require, except in circumstances to which paragraph 4 of this Article applies, the prior presentation of a certificate of origin and, where the import is from a State which has included that species in Appendix III, an export permit.*

4. *In the case of re-export, a certificate granted by the Management Authority of the State of re-export that the specimen was processed in that State or is being re-exported shall be accepted by the State of import as evidence that the provisions of the present Convention have been complied with in respect of the specimen concerned.*

Article VI

Permits and certificates

1. *Permits and certificates granted under the provisions of Articles III, IV, and V shall be in accordance with the provisions of this Article.*

2. *An export permit shall contain the information specified in the model set forth in Appendix IV, and may only be used for export within a period of six months from the date on which it was granted.*

3. *Each permit or certificate shall contain the title of the present Convention, the name and any identifying stamp of the Management Authority granting it and a control number assigned by the Management Authority.*

4. *Any copies of a permit or certificate issued by a Management Authority shall be clearly marked as copies only and no such copy may be used in place of the original, except to the extent endorsed thereon.*

5. *A separate permit or certificate shall be required for each consignment of specimens.*

6. *A Management Authority of the State of import of any specimen shall cancel and retain the export permit or re-export certificate and any corresponding import permit presented in respect of the import of that specimen.*

7. *Where appropriate and feasible a Management Authority may affix a mark upon any specimen to assist in identifying the specimen. For these purposes 'mark' means any indelible imprint, lead seal or other suitable means of identifying a specimen, designed is*

such a way as to render its imitation by unauthorized persons as difficult as possible.

Article VII

Exemptions and other special provisions relating to trade

1. The provisions of Articles III, IV and V shall not apply to the transit or transshipment of specimens through or in the territory of a Party while the specimens remain in Customs control.

2. Where a Management Authority of the State of export or re-export is satisfied that a specimen was acquired before the provisions of the present Convention applied to that specimen, the provisions of Articles III, IV and V shall not apply to that specimen where the Management Authority issues a certificate to that effect.

3. The provisions of Articles III, IV and V shall not apply to specimens that are personal or household effects. This exemption shall not apply where:

(a) in the case of specimens of a species included in Appendix I, they were acquired by the owner outside his State of usual residence, and are being imported into that State; or

(b) in the case of specimens of species included in Appendix II:

(i) they were acquired by the owner outside his State of usual residence and in a State where removal from the wild occurred;

(ii) they are being imported into the owner's State of usual residence; and

(iii) the State where removal from the wild occurred requires the prior grant of export permits before any export of such specimens;

Unless a Management Authority is satisfied that the specimens were acquired before the provisions of the present Convention applied to such specimens.

4. Specimens of an animal species included in Appendix I bred in captivity for commercial purposes, or of a plant species included in Appendix I artificially propagated for commercial purposes, shall be deemed to be specimens of species included in Appendix II.

5. Where a Management Authority of the State of export is satisfied that any specimen of an animal species was bred in captivity or any specimen of a plant species was artificially propagated, or is a part of such an animal or plant or was derived therefrom, a certificate by that Management Authority to the effect shall be accepted in lieu of any of the permits or certificates required under that provisions of Article III, IV or V.

6. The provisions of Articles III, IV and V shall not apply to the noncommercial loan, donation or exchange between scientists or scientific institutions registered by a Management Authority of their State, of herbarium specimens, other preserved, dried or embedded museum specimens, and live plant material carry a label issued or approved by a Management Authority.

7. A Management Authority of any State may waive the requirements of Articles III, IV and V and allow the movement without permits or certificates of specimens which from part of a travelling zoo, circus, menagerie, plant exhibition or other travelling exhibition provided that:

- (a) the exporter or importer registers full details of such specimens with that Management Authority;
- (b) the specimens are in either of the categories specified in paragraph 2 or 5 of this Article; and
- (c) the Management Authority is satisfied that any living specimen will be so transported and cared for as to minimize risk of injury, damage to health or cruel treatment.

Article VIII

Measures to be taken by the Parties

1. The Parties shall take appropriate measures to enforce provisions of the present Convention and to prohibit trade in specimens in violation thereof.

These shall include measures:

- (a) to penalize trade in, or possession of, such specimens, or both; and
- (b) to provide for the confiscation or return to the State of export of such specimens.

2. *In addition to the measures taken under paragraph 1 of this Article, a Party may, when it deems it necessary, provide for any method of internal reimbursement for expenses incurred as a result of the confiscation of a specimen traded in violation of the measures taken in the application of the provisions of the present Convention.*

3. *As far as possible, the Parties shall ensure that specimens shall pass through any formalities required for trade with a minimum of delay. To facilitate such passage, a Party may designate ports of exit and ports of entry at which specimens must be presented for clearance. The Parties shall ensure further that all living specimens, during any period of transit, holding or shipment, are properly cared for so as to minimize the risk of injury, damage to health or cruel treatment.*

4. *Where a living specimen is confiscated as a result of measures referred to in paragraph 1 of this Article:*

(a) the specimen shall be entrusted to a Management Authority of the State of confiscation;

(b) the Management Authority shall, after consultation with the State of export, return the specimen to that State at the expense of that State, or to a rescue centre or such other place as the Management Authority deems appropriate and consistent with the purposes of the present Convention:

(c) the Management Authority may obtain the advice of a Scientific Authority, or may, whenever it considers it desirable, consult the Secretariat in order to facilitate the decision under sub-paragraph (b) of this paragraph, including the choice of a rescue centre or other place.

5. *A rescue centre as referred to in paragraph 4 of this Article means an institution designated by a Management Authority to look after the welfare of living specimens, particularly those that have been confiscated.*

6. *Each Party shall maintain records of trade in specimens of species included in Appendices I, II and III which shall cover:*

(a) the names and addresses of exporters and importers; and

(b) the number and type of permits and certificates granted; the States with which such trade occurred; the numbers or quantities and types of

specimens, name of species as included in Appendices I, II and III and, where applicable, the size and sex of the specimens in question.

7. Each Party shall prepare periodic reports on its implementation of the present Convention and shall transmit to the Secretariat:

(a) an annual report containing a summary of the information specified in sub-paragraph (b) of paragraph 6 of this Article; and

(a) a biennial report on legislative, regulatory and administrative measures taken to enforce the provisions of the present Convention.

8. The information referred to in paragraph 7 of this Article shall be available to the public where this is not inconsistent with the law of the Party concerned.

United Nations Conference on Environment and Development also known as Rio de Janeiro Declaration or Earth Summit has adopted non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests. The preamble and principles are also contained in the book titled as "Documents in International Environmental Law which reads as under :-

"Preamble

(a) the subject of forests is related to the entire range of environmental and development issues and opportunities, including the right to socio-economic development on a sustainable basis.

(b) the guiding objective of these principles is to contribute to the management, conservation and sustainable development of forests and to provided for their multiple and complementary functions and uses.

(c) Forestry issues and opportunities should be examined in a holistic and balanced manner within the overall context of environment and development, taking into consideration the multiple functions and uses of forests, including traditional uses, and the likely economic and

social stress when these uses are constrained or restricted, as well as the potential for development that sustainable forest management can offer.

- (d) These principles reflect a first global consensus on forests. In committing themselves to the prompt implementation of these principles, countries also decide to keep them under assessment for their adequacy with regard to further international cooperation on forest issues.*
- (e) These principles should apply to all types of forests, both natural and planted, in all geographical regions and climatic zones, including austral, boreal, sub-temperate, temperate, subtropical and tropical.*
- (f) All types of forests embody complex and unique ecological processes which are the basis for their present and potential capacity to provide resources to satisfy human needs as well as environmental values, and as such their sound management and conservation is of concern to the Governments of the countries to which they belong and are of value to local communities and to the environment as a whole.*
- (g) Forests are essential to economic development and the maintenance of all forms of life.*
- (h) Recognizing that the responsibility for forest management, conservation and sustainable development is in many States allocated among federal/national, state/provincial and local levels of government, each State, in accordance with its constitution and/or national legislation, should pursue these principles at the appropriate level of government.*

Principles/elements

- 1.(a) 'States have, in accordance with the Charter of the United Nations and the principles of international law, sovereign right to exploit their own resources pursuant to their own environmental policies and have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction'.*

- (b) The agreed full incremental cost of achieving benefits associated with forest conservation and sustainable development requires increased international cooperation and should be equitably shared by the international community.*
- 2.(a) States have the sovereign and inalienable right to utilize, manage and develop their forests in accordance with their development needs and level of socio-economic development and on the basis of national policies consistent with sustainable development and legislation, including the conversion of such areas for other uses within the overall socio-economic development plan and based on rational land-use policies.*
- (b) Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations. These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products. Appropriate measures should be taken to protect forests against harmful effects of pollution, including air-borne pollution, fires, pests and diseases, in order to maintain their full multiple value.*
- (c) The provision of timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding and informed decision-making and should be ensured.*
- (d) Governments should promote and provide opportunities for the participation of interested parties, including local communities and indigenous people, industries, labour, non-governmental organizations and individuals, forest dwellers and women, in the development, implementation and planning of national forest policies.*
- 3.(a) National policies and strategies should provide a framework for increased efforts, including the development and strengthening of institutions and programmes for the management, conservation and sustainable development of forests and forest lands.*

(b) International institutional arrangements, building on those organizations and mechanisms already in existence, as appropriate, should facilitate international cooperation in the field of forests.

(c) All aspects of environmental protection and social and economic developments as they relate to forests and forest lands should be integrated and comprehensive.

4. The vital role of all types of forests in maintaining the ecological processes and balance at the local, national, regional and global levels through, inter alia, their role in protecting fragile ecosystems, watersheds and freshwater resources and as rich storehouses of biodiversity and biological resources and sources of genetic material for biotechnology products, as well as photosynthesis, should be recognized.

5.(a) National forest policies should recognize and duly support the identity, culture and the rights of indigenous people, their communities and other communities and forest dwellers. Appropriate conditions should be promoted for these groups to enable them to have an economic stake in forest use, performs economic activities, and achieve and maintain cultural identity and social organization, as well as adequate levels of livelihood and well-being, through, inter alia, those land tenure arrangements which serve as incentives for the sustainable management of forests.

(b) The full participation of women in all aspects of the management, conservation and sustainable development of forests should be actively promoted.

6. (a) All types of forests play an important role in meeting energy requirements through the provision of a renewable source of bio-energy, particularly in developing countries, and the demands for fuelwood for household and industrial needs should be met through sustainable forest management, afforestation and reforestation. To this end, the potential contribution of plantations of both indigenous and introduced species for the provision of both fuel and industrial wood should be recognized.

(b) National policies and programmes should take into account the relationship, where it exists,

between the conservation, management and sustainable development of forests and all aspects related to the production, consumption, recycling and/or final disposal of forest products.

(c) Decisions taken on the management, conservation and sustainable development of forest resources should benefit, to the extent practicable, from a comprehensive assessment of economic and non-economic values of forest goods and services and of the environmental costs and benefits. The development and improvement of methodologies for such evaluations should be promoted.

(d) The role of planted forests and permanent agricultural crops as sustainable and environmentally sound be recognized, enhanced and promoted. Their contribution to the maintenance of ecological processes, to offsetting pressure on primary/old-growth forest and to providing regional employment and development with the adequate involvement of local inhabitants should be recognized and enhanced.

(e) Natural forests also constitute a source of goods and services, and their conservation, sustainable management and use should be promoted.

7.(a) Efforts should be made to promote a supportive international economic climate conducive to sustained and environmentally sound development of forests in all countries, which include, inter alia, the promotion of sustainable patterns of production and consumption, the eradication of poverty and the promotion of food security.

(b) Specific financial resources should be provided to developing countries with significant forest areas which establish programmes for the conservation of forests including protected natural forest areas. These resources should be directed notably to economic sectors which would stimulate economic and social substitution activities.

8.(a) Efforts should be undertaken towards the greening of the world. All countries, notably developed countries, should take positive and transparent action towards reforestation,

afforestation and forest conservation, as appropriate.

- (b) Efforts to maintain and increase forest cover and forest productivity should be undertaken in ecologically, economically and socially sound ways through the rehabilitation, reforestation and re-establishment of trees and forests on unproductive, degraded and deforested lands, as well as through the management of existing forest resources.*
 - (c) The implementation of national policies and programmes aimed at forest management, conservation and sustainable development, particularly in developing countries, should be supported by international financial and technical cooperation, including through the private sector, where appropriate.*
 - (d) Sustainable forest management and use should be carried out in accordance with national development policies and priorities and on the basis of environmentally sound national guidelines. In the formulation of such guidelines, account should be taken, as appropriate and if applicable, of relevant internationally agreed methodologies and criteria.*
 - (e) Forest management should be integrated with management of adjacent areas so as to maintain ecological balance and sustainable productivity.*
 - (f) National policies and/or legislation aimed at management, conservation and sustainable development of forests should include the protection of ecologically viable representative or unique examples of forests, including primary/or-growth forests, cultural, spiritual, historical, religious and other unique and valued forests of national importance.*
 - (h) National policies should ensure that environmental impact assessments should be carried out where actions are likely to have significant adverse impacts on important forest resources, and where such actions are subject to a decision of a competent national authority.*
- 9.(a) the efforts of developing countries to strengthen the management, conservation and sustainable development of their forest resources should be*

supported by the international community, taking into account the importance of redressing external indebtedness, particularly where aggravated by the net transfer of resources to developed countries, as well as the problem of achieving at least the replacement value of forests through improved market access for forest products, especially processed products. In this respect, special attention should also be given to the countries undergoing the process for transition to market economies.

(b) The problems that hinder efforts to attain the conservation and sustainable use of forest resources and that stem from the lack of alternative options available to local communities, in particular the urban poor and poor rural populations who are economically and socially dependent on forests and forest resources, should be addressed by Governments and the international community.

(c) National policy formulation with respect to all types of forests should take account of the pressures and demands imposed on forest ecosystems and resources from influencing factors outside the forest sector, and intersectoral means of dealing with these pressures and demands should be sought.

10. New and additional financial resources should be provided to developing countries to enable them to sustainably manage, conserve and develop their forest resources, including through afforestation, reforestation and combating deforestation and forest and land degradation.

11. In order to enable, in particular, developing countries to enhance their endogenous capacity and to better manage, conserve and develop their forest resources, the access to and transfer of environmentally sound technologies and corresponding know-how on favourable terms, including on concessional and preferential terms, as mutually agreed, in accordance with the relevant provisions of Agenda 21, should be promoted, facilitated and financed, as appropriate.

12.(a) Scientific research, forest inventories and assessments carried out by national institutions which take into account, where relevant, biological, physical, social and economic variables, as well as

technological development and its application in the field of sustainable forest management, conservation and development, should be strengthened through effective modalities, including international cooperation. In this context, attention, should also be given to research and development of sustainable harvested non-wood products.

(b) National and, where appropriate, regional and international institutional capabilities in education, training, science, technology, economics, anthropology and social aspects of forests and forest management are essential to the conservation and sustainable development of forests and should be strengthened.

(c) International exchange of information on the result of forest and forest management research and development should be enhanced and broadened, as appropriate, making full use of education and training institutions, including those in the private sector.

(d) Appropriate indigenous capacity and local knowledge regarding the conservation and sustainable development of forests should, through institutional and financial support and in collaboration with the people in the local communities concerned, be recognized, respected, recorded, developed and, as appropriate, introduced in the implementation of programmes. Benefits arising from the utilization of indigenous knowledge should therefore be equitably shared with such people.

13.(a) Trade in forest products should be based on non-discriminatory and multilaterally agreed rules and procedures consistent with international trade law and practices. In this context, open and free international trade in forest products should be facilitated.

(b) Reduction or removal of tariff barriers and impediments to the provision of better market access and better prices for higher value-added forest products and their local processing should be encouraged to enable producer countries to better conserve and manage their renewable forest resources.

(c) Incorporation of environmental costs and benefits into market forces and mechanisms, in order to

achieve forest conservation and sustainable development, should be encouraged both domestically and internationally.

(d) Forest conservation and sustainable development policies should be integrated with economic, trade and other relevant policies.

(e) Fiscal, trade, industrial, transportation and other policies and practices that may lead to forest degradation should be avoided. Adequate policies, aimed at management, conservation and sustainable development of forests, including, where appropriate, incentives, should be encouraged.

14. Unilateral measures, incompatible with international obligations or agreements, to restrict and/or ban international trade in timber or other forest products should be removed or avoided, in order to attain long-term sustainable forest management.

15. Pollutants, particularly air-borne pollutants, including those responsible for acidic deposition, that are harmful to the health of forest ecosystems at the local, national, regional and global levels should be controlled.

The conference of the Parties was convened in Bali. International conference of Bali was under the frame work on *Climate Change*. The objectives of the conference are known as “Bali Action Plan” whereby it was resolved to urgently enhance implementation of the convention in order to achieve its ultimate objective with regard to principles and commitments. According to the **Bali Action Plan** which was convened in the year 2007 at Bali (Indonesia), it was decided to launch a comprehensive process to enable to full, effective and sustained implementation of the Convention through long term cooperative action. Paragraph 1(b)(iii) reads as under :-

“Policy approaches and positive incentives on issues relating to reducing emissions from deforestation

and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.”

In the book of *Forest Futures (Global Representations and Ground Realities in the Himalayas)* authored by Antje Linkenbach has made following pertinent observations on the concept of **Chipko Andolan** which was nationally and internationally acclaimed :

“With the global emergence of the ecological debate the fame of the Chipko Andolan (i.e. the ‘hug the trees’ movement) spread in India and abroad. This andolan was represented national and internationally by two of its leading figures, Chandi Prasad Bhatt, and, especially, Sunderlal Bahuguna. Both received several awards for their ecological commitment and are widely accepted as spokesman in ecological matters. Chipko developed into a popular subject in print and audio-visual media; it has been taken up as an issue in academic debates; it served and still serves political and ideological arguments. Numerous publications have dealt with, or have at least referred to, Chipko’s incidents. And differing re-presentations of the Chipko anodlan show that the movement became instrumental for various interest groups: it has been presented to the public as an ‘ecological movement, as a ‘peasant movement’ with ecological impact, as a ‘women’s or eco-feminist movement’ as a ‘Gandhian movement’ (forest satyagraha). In most of these publications a protective

(‘ecologically friendly’) attitude is assumed to guide traditional relations with nature and the social practices of the people in Uttarakhand, who, accordingly, are believed to perceive environmental degradation as primarily an ecological problem.”

According to the author, there are three most effective representations of Chipko Andolan which consist of Peasant movement, Ecological movement and Eco-feminist movement.

Author has translated Chipko song, composed and sung by Women of Lata which is as under :-

*“Hey, didi, hey bhulli, let us all unite
and with our own efforts let us save our jungle.
The maldars and thekedars want to make money.
Our cows and our cattle, they go to the jungle
and with them our young people.
Hey, Rishi Maharaj, come and show yourself with your
real power.
Chase for away the 600 trucks heavily loaded,
and along with them drive back the strangers.
Hey, Lata Bhagvati, come and show yourself with your
real power,
chase for away the maldars and thekedars.
When our jungle is saved, only then will return (to our
villages).*

The Tilari Declaration was adopted by the people on 30.05.1968 in the memory of the martyrs who laid down their lives for the protection of the forest rights on 30.05.1968.

- Forests have been the basis of our cultural and economic life from the very beginning of this civilization.
- Our main duty is to protect the forest.

- We declare our birthright as being to fulfil our basic needs through forest products, through the forest, and to get employment from the forest.
- The harmonious relationship to the forest which is the basis of our happiness and prosperity should be permanent, for it is essential.
- The first use of forest wealth should be for the happiness and prosperity of the forest dwellers, of the people living near the forest.
- The forest products which are of daily use and which are used for village industries should be easily available for everybody.
- Forest industries based on forest products should be established near the forest.
- The present system of forest exploitation by the contractors should be replaced with forest labour co-operatives of the local people.
- In order to link love with knowledge about the forest in forest areas, botany and geology should be a part of curriculum at every stage of education in forest areas.
- On this day we pay our homage to the brave martyrs of Tilari and we remember them with great reverence.
- Their peaceful movement and brave martyrdom may inspire us and keep us alert for the protection of forest and forest rights.
- So we take a pledge to celebrate this day as 'Forest Day'.

Learned author has reproduced Chipko slogans as under :-

- Protection of forests means protection of the country!
(Vanon ki raksha, desh ki raksha)
- This is the call of Uttarakhand-forest rights in panchayats hands!
(Uttarakhand ke yeh lalkar, panchayaton ko van adhikar)
- Stop our exploitation by the contractor system!
- Daily earnings from forest wealth – this is a right of forest dwellers!
(Van sampada se rozgar, vanvasiyon ka adhikar)

Learned author has also translated Chipko Song composed by Ghanshyam Shailani which reads as under :-

“Brothers and Sisters from the hills! Let us all gather and unite.

let us be ready to save our beloved jungle from the government’s forest policy.

Through auctioneers and contractors all the forests have been cut away.

Bad times have come

and in the hills the forest has been destroyed.

The whole benefit of the jungle has been taken away by contractors.

For years, we have cared for the forest

and for long we have protected the jungle.

Today the rich capitalists are cutting forests and accumulating wealth,

And young people of the hills, who have real rights to
the forest

go to the plains and wash their dishes.

Today the factory for resin processing is located in
Bareilly,

But the resin, the raw material, they get from here;
and the whole profit goes to the Bareilly resin factory

In order to earn more wealth from the chir pines
deep wounds were cut in them and resulted in too
many trees dying.

The government and the rich capitalists together
are sweeping the jungle clear,

And nobody worries about planting new trees.

Instead, the Forest Department has become the
destroyer of forests.

To save the jungle there are no hopes,
to save the jungle there are no words.

Cling to the trees and don't let them be cut!

Don't let the forest's wealth be plundered!

Through the establishment of small forest-based
industries

benefit will come to the hill region,

and through it fortune and prosperity to forest
dwellers.

Everywhere in the hills socialism will come

and from village to village the sound of the conch* will
be heard.

The contribution of Sri Sunderlal Bahuguna is discussed as under:-

“In sum, Bahuguna’s alternative concept of development is marked by an emphasis on sustainability and ethics which lead to an attitude towards nature instructed by worship and respect. To achieve sustainability, care for posterity should get at least that much, if not more’ (1990:12). Therefore, the contract between the generations’, to put it in the words of Jonas and King, demands not exploiting or over exploiting non-renewable as well as renewable resources. This alternative does not dismiss science and technology, but demands they be guided by ‘wisdom’, which is neither contained in volumes of books nor in the minds of great professors, but in the lives of the common people’ (1992:9). And this wisdom lies, in part, in ‘switching over from agriculture to tree farming’ (1992:10). Such farming would not propagate species which are useful for commercial purposes:

The tree cover around the villages should be such as to provide food to human beings and fodder to the cattle. Priority should be given to trees yielding edible seeds, nuts, oilseeds, honey and seasonal fruits. In higher altitudes, above 1500 metres, soft walnut, sweet chestnut, hazelnut and wild apricot can be successfully cultivated. In lower altitudes mango, amla, bael, and jamun [indigenous names of local fruits] will thrive. An average hill family will need 300 nuts/fruits, 1500 fodder and 200 fibre trees (mulberry, ringal and bamboo) to be self-sufficient.(1989c:8).

Forest fires emanate carbon-dioxide posing serious threat to environment and ecology. It is the human beings who have encroached upon the forest land of wild animals. The habitat of wild animal is shrinking resulting in wild animals coming in contact with the human beings.

The preamble and principles formulated by United Nations Conference on Environment and Development states that the forestry issues and opportunities should be examined in a holistic and balanced manner within the overall context of environment and development, taking into consideration the multiple functions and uses of forests, including traditional uses, and the likely economic and social stress when these uses are constrained or restricted. All types of forests embody complex and unique ecological processes which are the basis for their present and potential capacity to provided resources to satisfy human needs as well as environmental values. Forests are essential to economic development and the maintenance of all forms of life. Forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual human needs of present and future generations. These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products. Appropriate measures should be taken to protect forests against harmful effects of pollution, including air-borne pollution, fires, pests and diseases, in order to maintain their full multiple value. The provision of timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding and informed decision-making and should be ensured. Governments should promote and provide opportunities for the participation of interested parties, including local

communities and forest dwellers and women, in the development, implementation and planning of national forest policies. National policies and strategies should provide a framework for increased efforts, including the development and strengthening of institutions.

The vital role of all types of forests in maintaining the ecological processes and balance at the local, national, regional and global levels should be recognized. National forest policies should recognize and duly support the identity, culture and the rights of indigenous people, their communities and other communities and forest dwellers. The full participation of women in all aspects of the management, conservation and sustainable development of forests should be actively promoted. The forests play an important role in meeting energy requirements through the provision of a renewable source of bio-energy. The role of planted forests and permanent agricultural crops as sustainable and environmentally sound be recognized, enhanced and promoted. Their contribution to the maintenance of ecological processes, to offsetting pressure on primary/old-growth forest and to providing regional employment and development with the adequate involvement of local inhabitants should be recognized and enhanced. Natural forests also constitute a source of goods and services, and their conservation, sustainable management and use should be promoted. Efforts should be made for increasing the forest productivity.

National policies and/or legislation aimed at management, conservation and sustainable development of forests should include the protection of ecologically viable representative or unique examples of forests, including primary/old-growth forests, cultural, spiritual, historical, religious and other unique and valued forests of national importance. National policies should ensure that environmental impact assessments should be carried out

where actions are likely to have significant adverse impacts on important forest resources. National policy should be formulated with respect to all types of forests taking into account of the pressures and demands imposed on forest ecosystems.

Lord Gautam Budha and Lord Mahavira also sat under the trees for enlightenment. The trees in India are worshipped as incarnations of the goddess: Bamani Rupeshwari, Vandurga. The goddess of the forest, Aranyi, has inspired a whole body of texts, known as '*Aranyi Sanskriti*'. It means, "**the Civilisation of Forest**".

Animals and birds are trapped in the fire. Birds lose their sense of direction due to heavy smog.

It is the human beings who have encroached upon the forest land of wild animals. The habitat of wild animal is shrinking resulting in wild animals coming contact with the human beings.

Trees and wild animals have natural fundamental rights to survive in their natural own habitat and healthy environment.

Their Lordships of Hon'ble Supreme Court in **(2015) 7 SCC 347**, titled as "**Union of India Vs. Zavaray S. Poonawala and others**"; have held that India became a signatory to CITES in 1976. As per CITES, the species which are set out in Appendix I of CITES, whereby import and export is to be restricted inasmuch as the spirit of the prohibition against import/export/trade of trophies of prohibited and protected animals is that it is reprehensible to hunt and display endangered species which are fast vanishing from the earth. Saving wild life is a core responsibility of mankind. Animal population is disappearing at an alarming rate. Saving endangered species' plants and

animals from becoming extinct and protecting their wild places is crucial for our health and the future of our children. Their Lordships have also held which read as under:-

“7. It would be pertinent to mention here that after the aforesaid permission was granted by the Joint Director, albeit conditional, CITES wrote a letter dated 8-11-2002 raising a query as to under what circumstances such a permission was granted. CITES had taken the position that it is under an obligation to regulate the export and import of species as set out in Appendix I of CITES. The Authority constituted under CITES is charged with the responsibility of granting approvals under CITES insofar as imports in the Western Region are concerned. As per CITES, the species which are set out in Appendix I of the Convention, their import and export is to be restricted inasmuch as the spirit of the prohibition against import/export/trade of trophies of prohibited and protected animals is that it is reprehensible to hunt and display endangered species which are fast vanishing from the earth. Such animals and trophies should not be made objects of aggrandisement and display in homes and commercial establishments.

15. *Saving wild life is a core responsibility of mankind. Animal populations are disappearing at an alarming rate. Saving endangered species (plants and animals) from becoming extinct and protecting their wild places is crucial for our health and the future of our children. Man has produced a thousand and one inventions while observing Nature. Think of Leonardo da Vinci, who drew flying machines as he watched the flight of bats. In the area of human health, animals and plants often show us the way to stay in shape. As species are lost it impacts the possibility of future discovery and advancement. The impacts of biodiversity loss include clearly into fewer new medicines, greater vulnerability to natural disasters and greater effects from global warming. In Nature, everything is interconnected. Unfortunately, we often have very little idea of all the repercussions involved in the disappearance of a single animal population in a corner of a forest, swamp or river. Unrecognised benefits of maintaining biological diversity are those services we receive when ecosystems function normally. These ecosystem functions include energy fixation, chemical cycling (oxygen production by rainforests), soil generation and maintenance,*

ground water recharge, water purification, and flood protection. These services are provided to us at no cost. When we destroy the ability of ecosystems to function naturally, we not only lose these free services but all too often have to pay to replace them.

16. *Protecting these species contributes to a thriving, healthy planet for people's health and well being. Wild Life nurtures a sense of wonder. It is integral to maintain the balance of Nature. Ultimately, by protecting these species, we save this beautiful, vulnerable and utterly irreplaceable planet we call home. By protecting species, we also protect the essential goods and services that make our lives possible and contribute enormously to human health and well being — breathable air, clean water, food, fibres, building materials, medicines, energy, fertile soils, climate regulation, transport, and recreational and spiritual values. We are on a mission to find solutions that save the marvellous array of life on our planet.*

17. *If a species goes extinct, it's lost forever. Any aesthetic value it once had is gone. As Theodore Roosevelt said, "When I hear of the destruction of a species, I feel just as if all the works of some great writer have perished."*

Their Lordships of Hon'ble Supreme Court in **(2015) 12 SCC 611**, titled as **"Hindustan Zinc Limited Vs. Rajasthan Electricity Regulatory Commission"**; have held that Section 86(1)(e) of the 2003 Act is valid and legal, keeping in view the National Electricity Policy, 2005 and the Tariff Policy of 2006 which are framed by the Union of India. The international obligation under the **Kyoto Protocol** to which our country is signatory and also most importantly to discharge the constitutional obligations as mandated under Article 21-fundamental right of the citizens and Article 48-A the directive principles of State policy and to discharge the fundamental duties as envisaged under Article 51-A(g) of the Constitution of India. Article 21, Article 48-A and Article 51-A(g) of Constitution of India read as under :-

“21. Protection of life and personal liberty.—
No person shall be deprived of his life or personal liberty except according to procedure established by law.

²**[48-A. Protection and improvement of environment and safeguarding of forests and wild life.—***The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country.]*

51-A. Fundamental duties.—*It shall be the duty of every citizen of India—*

(a)

(b)

(c)

(d)

(e)

(f)

(g) *to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.”*

In **AIR 1997 DELHI 301 (Full Bench)**, titled as **“G.R. Simon and others etc. Vs. Union of India, and others”**; it has been held that it is fundamental duty of every citizen to protect and improve the natural environment including various lake, rivers and wild life and to have compassion for living creatures. Each and every animal plays a role in maintaining the ecological balance and, therefore, the contention that certain animals have no role to play or are detrimental to human life is completely misconceived. Their Lordships have also held as under :-

(9) *The protection of Wild Life is included in the directive principles of the State policy under the 42nd Constitutional Amendment Act, 1976 under Clause G of Article [51A](#) of the Constitution. It is the fundamental duty of every citizen to protect and improve the natural environment including various lakes, rivers and Wild Life and to have compassion for living creatures. The contention of the petitioners that protection and preservation of Wild Life was not in public interest was Therefore devoid of all merit. Wild Life forms*

part of our cultural heritage in the same manner as other archaeological monuments painting, literature etc. Each and every animal plays a role in maintaining the ecological balance and, Therefore, the contention that certain animals have no role to play or are detrimental to human life is completely misconceived. Taking the case of even jackals, which are referred to by the petitioners as animals of no utility, these are natural scavengers who feed on offal and dead animals, thereby keeping the environment clean. Snakes which have been described by some petitioners as harmful and dangerous to human life feed on rats. The mortality rate in the country due to snake bites is less than 0.0005%, which is very low compared to the death and fatalities caused by other diseases and animal bites. Snakes are the natural killers of rats which cause loss of nearly 33 million tonnes of stored cereals, apart from dreaded diseases such as plague. Russel Wipers and Rat snakes are known to have fascination of rats for food. The above would show that even the most maligned animals which appear apparently to be of no utility, have a role to play in retaining ecological balance. Besides, it is only when human beings tread their natural habitat that animals react. The Wild Life (Protection) Act has provisions to deal with and eliminate those animals which become harmful to human lives or properties. Thus, the argument that certain wild animals are harmful to life and serve no useful purpose is misconceived. It is to be recognized that Wild Life is an asset and heritage to be preserved for future generations.”

The first written act relating to wild life protection was brought out by the British during the latter half of the 19th century i.e. **the Elephants Preservation Act, 1879**. The salient features of the Act read as under :-

- (i) *Nobody is permitted to kill, injure or capture, or attempt to kill, injure or capture, any wild elephant unless in defence of himself or some other person, or*

if the elephant is found injuring houses or cultivation, or in the immediate vicinity of, any main public road or any railway or canal.

- (ii) The Collector or Deputy Commissioner of any district may, subject to such rules as may, for the time being in force under this Act grant licences to kill, or to capture or to kill and capture wild elephants.*
- (iii) There is a provision of a fine which may extend to five hundred rupees for killing, injuring or capturing an elephants or attempting to do so or for breaking any condition contained in a licence granted under this Act. For a second offence under this Act there is a provision of imprisonment which may extent to six months, or with fine, or with both.”*

In Corpus Juris Secundum, Volume III, page 1087, it is stated “that the wild animals at large within its borders are owned by the State in its sovereign as distinguished from its proprietary capacity and neither such animals nor any part thereof are subject to private ownership except insofar as the State may choose to make them so.

In American Jurisprudence, Volume II, page 694, the following passage occurs “in the United States the ownership of wild animals and fish not reduced to actual possession by private person is in the people of the State in their collective sovereign capacity, or in the State as representing all the people.”

Similarly, protection for wild birds, the Wild Birds Protection Act No. X of 1887 was introduced. Thereafter, amendment was made in the act in 1935 whereby the provincial government by notification could declare any area to be a Sanctuary for birds and animals and it was made

unlawful to kill or capture any such bird or animal within that area.

The Inspector-General of Forests and Director (Project Elephant) has issued a notification on 11.11.2009 regarding the death of elephants by electrocution which reads as under :-

“The Ministry is receiving reports of deaths in tea/coffee estates especially in Assam and Karnataka due to unregulated voltage in the solar power fencing erected by them. This is a serious issue and in fact such an Act tantamounts to wilful hunting as per section 16(b) and thus is in violation of section 9 of the Wildlife (Protection) Act, 1972.

2. You are, therefore, requested to make it known to all the tea gardens, coffee estates and other located in the elephants areas to ensure that no such fencings are erected in future. Wherever death of elephants due to electrocution in such places have taken places, the management needs to be prosecuted for hunting and such fencing needs to be removed at once.”

The last National Forest Policy was framed in the year 1988. There is an urgent need to prepare fresh National Forest Policy to preserve the forest.

There are about 250 tigers in Jim Corbett National Park as per All India Tigers Estimation. The Animal Conservation authority has shown serious concern about the safety of these tigers. Jim Corbett National Park was earlier known as Hailey National Park. It was established in the year 1936 being an oldest National Park in Asia.

There is a constant conflict between man and animal. Corridors of tigers have been encroached upon. There is a need to declare 10 Kms. Eco-sensitive Zone around all the sanctuaries and National Parks in the State of

Uttarakhand including Jim Corbett National Park. Further construction is required to be banned within the radius of 10 Kms. of Jim Corbett National Park. No new villages or new dwellers should be permitted to come out in future in close proximity in the National Parks. Similarly, there is threat to tigers in Rajaji National Park.

Forest Department should notify corridors for elephants. Speed of trains should not be more than 30 Kms./hr. while passing through Rajaji National Park. The drivers of the train should be sensitized. There should be coordination between forest department and railways. All the developers should be ordered to have at least 20% greenery in housing developing projects.

Central Government is required to frame National Forest Policy to save forest by taking into consideration the preamble and guidelines issued by United Nations Conference on Environment and Development also called Rio de Janeiro Declaration/ Earth Summit as quoted hereinabove.

It is our “constitutional”, “spiritual” and “moral” responsibility to save the forest. It is bounden duty of all of us to save the endangered animals as well as plant species from extinction. We must respect the nature. There should not be excessive consumption of forest produce. We must ensure to preserve the eco-system. In burnt out areas, fresh plantation should be undertaken.

According to the India State of Forest Report 2015 prepared by the Forest Survey of India, Ministry of Environment, Forest and Climate Change, following are the Forest and Tree resources: -

Forest and Tree Resources

- Forest Cover of the country as per this assessment is 701,673 sq. km (70.17 million ha) which is 21.34 percent of the geographical area of the country. The tree cover of the country is estimated to be 92,572 sq. km (9.26 million ha) which is 2.82 per cent of the geographical area.
- The total Forest and Tree cover of the country as per this assessment is 794,245 sq. km (79.42 million ha) which is 24.16 per cent of the geographical area of the country.
- There is an increase of 3,775 sq. km in the forest cover of the country as compared to 2013 assessment.
- The forest cover information has been given separately inside and outside the recorded forest area for twelve states. For rest of the states, the information has been given inside and outside the green-wash of Survey of India (SOI) topsheets. As the green wash areas broadly coincide with the 'Forest' of the country, it gives a fair idea about the forest cover inside and outside the forest area.
- In hill and tribal districts of the country, there is a net increase of forest cover of 1,680 sq. km and 438 sq. km. respectively as compared to the previous assessment.
- The North-Eastern States of India account for one-fourth of the country's forest cover. There is a net decline of 628 sq. km in forest cover as compared to the previous assessment.
- Mangrove cover has increased by 112 sq. km as compared to the previous assessment.
- The total growing stock of India's forest and trees outside forests is estimated as 5,768 million cum which

comprises of 4,195 million cum inside the forests and 1,573 million cum outside the forests.

- There is an increase of 110.34 m. cum in total growing stock of the country as compared to last assessments as reported in ISFR 2013. Out of this, the increase inside forest is 21.69 m. cum. and that outside the forest is 88.66 m. cum.
- In the present assessment total carbon stock in forest is estimated to be 7,044 million tonnes. There is an increase of 103 million tonnes in the carbon stock of country as compared to the last assessment.

The Recorded Forest Area (RFA) of the State of Uttarakhand is as follows: -

State	Geographical Area (GA)	RFA as reported in ISFR 2013	RFA (As revised by SFDs)			Total RFA 2015	Percent of GA
			RFA	PF	Unclassed Forests		
Uttarakhand	53,483	34,651	26,547	9,885	1,568	38,000	71.05

Similarly, the Forest Cover in the State of Uttarakhand is given as under: -

2015 Assessment							
State	Geographical Area (GA)	VDF	MDF	OF	Total Forest	Percent of GA	Change in forest cover wrt ISFR 2013
Uttarakhand	53,483	4,754	13,602	5,884	24,240	45.32	-268

A startling revelation has been made in the report that the State of Uttarakhand has shown considerable negative changes and the forest area has been reduced by 268 square kilometers. The reason assigned in the report, for decrease of

the Recorded Forest Area of Uttarakhand, is due to rotational felling and diversion of forest land for development activities. This trend is required to be reversed.

Trees provide us oxygen. Trees also control the climate. According to the U.S. Department of Agriculture, “One acre of forest absorbs six tons of carbon dioxide and puts out for tons of oxygen. This is enough to meet the annual needs of 18 people.” The trees have supported and sustained life throughout our existence. Forests are the home for animals. They minimize the pollution, prevent the soil erosion, bring rainfall and provide us timber. Overall, they keep the earth cool.

Accordingly, the present petition is allowed by issuing the following mandatory directions to the State Government/respondents to protect the Forest Environment, Ecology and Wild Life: -

- a. Union of India is directed to formulate National Forest Policy aiming on forest management, conservation and sustainable development also to maintain and increase forest covers and notify the same within a period of six months as per preamble and guidelines framed by United Nations Conference on Environment and Development also called Rio de Janeiro Declaration/ Earth Summit/Forest Principles. The National Forest policy must integrate with other economic policies.
- b. Union of India is directed to declare 10 Kms. of Eco Sensitive Zone around Jim Corbett National Park, other National Parks and Sanctuaries throughout the State of Uttarakhand within a period of six months. Till then, no fresh

construction shall be undertaken by any person/institution within the radius of 10 Kms. of Jim Corbett National Park and other National Parks throughout the State of Uttarakhand. No new road shall be constructed through Jim Corbett National Park, National Parks and Sanctuaries in the State of Uttarakhand.

- c. No wild animals including tigers, leopards and panthers shall be declared man-eater/rouge and killed in entire State of Uttarakhand. Dead body of wild animal shall not be displayed in print media, electronic media including television. Henceforth, the wild animal who poses threat to human life should be captured alive by using tranquilizer gun in the presence of Veterinary Doctor. Captured wild animal shall be thereafter released in nearby forest/jungle or alternatively, can be kept in zoo temporarily and thereafter, be released in its own habitat.
- d. The decision, whether wild animal causes threat to life of human being, shall be taken at the highest level by a committee comprising of Principal Secretary, Forest and Principal Chief Conservator of Forest. No private hunter shall be engaged by the State Government to kill wild animals.
- e. Ministry of Railways is directed to dig up trenches around the electric poles along railway track in Rajaji National Park and also to insulate the electric poles by raising fence to avoid electrocution of wild animals within a period of three months from today.
- f. State Government is directed to follow the notification dated 11.11.2009 issued by the

Inspector-General of Forests and Director (Project Elephant) in letter and spirit for saving the elephants from electrocution.

- g. State Government is directed to make suitable amendments in existing forest laws and laws pertaining to wild animals for imposing exemplary punishment including life imprisonment for poacher's.
- h. State Government is directed to appoint at least 10,000 fire watchers in order to detect and contain the forest fire at the earliest during summer season. Number of fire towers should be increased.
- i. State Government is further directed to constitute a committee comprising of the Head of Forest Research Institute, Dehradun and Principal Secretary, Forest, State of Uttarakhand to save following endangered species of plants in Uttarakhand within three weeks:
 - Aconitum heterophyllum, Dactylorhiza hatagirea, Alpinia galangal, Coptis teeta, Nardostachys grandiflora, Podophyllum hexandrum, Panax pseudo-ginseng, Picrorhiza kurrooa, Dioscorea deltoidea, Angelica glauca, Allium stracheyi, Podophyllum hexandrum, Nardostachys grandiflora, Aconitum spp., Picrorhiza kurrooa, Saussurea lappa and Dactylorhiza hatagirea.
- j. State Government is directed to provide sufficient funds to prevent and control the forest fires in the all the coming financial years.
- k. State Government is directed to dig sufficient water bodies in the forest areas to control forest fires and maintain the moisture in environment.

- l. Respondents are directed to use foam and other fire retardants to control the forest fires.
- m. Disaster Management Plan be strengthened.
- n. The cadre strength of Forest officers working in the field be increased at least by 30%.
- o. State Government is also directed to provide fire fighting tools including fire proof clothing and machinery to the forest officials. They should be provided with latest monitoring equipment. The equipments should be updated from time to time. Local people must be associated to control forest fires by constituting the Fire Protection Groups.
- p. Gujjars who have encroached upon the forest land be evicted within a period of one year from today.
- q. Forest fire range should be cleaned and maintained properly every three months.
- r. State Government should undertake the detailed geological, ecological and botanical survey in the entire State of Uttarakhand within a period of one year.
- s. State Government is also directed to fix pre-warning alerts system.
- t. Numbers of personnel of SDRF and NDRF be increased and deployed during fire months i.e. May, June & July in order to prevent and control forest fire.

- u. In case, the Forest fire continues for more than 24 hours, the concerned Divisional Forest Officer shall be deemed to be put under suspension. Similarly, if forest fire continues for more than 48 hours, the Conservator of Forest shall be deemed to be put under suspension. Lastly, if forest fire continues for more than 72 hours, Principal Chief Conservator of Forest shall be deemed to be put under suspension and disciplinary proceedings shall be initiated against them for not preventing/controlling forest fires.
- v. A person who causes forest fires intentionally must be sternly dealt with by framing suitable law.
- w. State Government is directed to ensure that all the developers maintain at least 20% greenery in housing developing projects.
- x. The State Government in coordination with the Central Government is directed to raise stone wall around the Jim Corbett National Park and other National Parks to save the wild animals.
- y. Forest Department is directed to set up a monitoring cell to track movement of elephants and other wild animals and to inform railway authorities. There shall be coordination between the Forest Department and the Railways. Railway authorities are directed to ensure that the speed of trains should not be more than 30 Kms/hr. while passing of the train through Jim Corbett National Park.

- z. State Government is also directed to formulate a policy to pay compensation/damages to the farmers for the loss of their crops due to forest fires within six months.

We must ensure greener future. There is moral as well as spiritual challenge to save forest for the coming generations. The children cannot be robbed of their future by destroying forest wealth recklessly by this generation.

The Principal Secretary, Forest and Environment, Government for Uttarakhand, shall be personally liable to take necessary steps to comply with the directions issued hereinabove forthwith in letter and spirit.

“Let us save forest to save ourselves”.

(Alok Singh, J.)

(Rajiv Sharma, J.)

19.12.2016