



RIGHT TO ENVIRONMENT AND CHALLENGES OF BIOTERRORISM

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¹Chari, P.R, Chandran, Suba. *Bio-terrorism and Bio-Defence*, Manohar Publishers& Distributors, New Delhi, (2005), p 131.

Introduction

History has witnessed various instances of use of biological weapons for military purposes. Man has never been inhibited to use devastating means in order to achieve their objectives. The instances begin from Persians poisoning wells to deny water to their enemies to deliberate spread of diseases. India has not been left of these strategies as instances of bio terrorism can be traced back to the medieval India. The use of biological weapons was banned during the Cold War by the Biological Weapon Convention (BWC). The BWC is a multilateral treaty which banned the development, production and stockpiling of entire category of weapons. The treaty was signed in London, Moscow and Washington D.C. by 109 countries on 10th April and became effective on 26 March 1975.

But the real question which arises is that why should India or perhaps any other country invest its resources deterring a threat that is contractually extinct? There are terrorist groups who are interested in acquiring these weapons in order to blackmail the countries to caving to their demands. With most of the world's countries at war, there is a possibility the government of these countries form alliances with the terrorist groups to spread destruction in their enemy countries. These alliances have been formed in countries like Iran, North Korea, Libya and Syria¹. The recent breakout of the Ebola virus which originated in Africa is the recent example of how dangerous bioweapons are. Therefore, bioterrorism is threat which still threatens the humanity and needs to be addressed.

However, it should be considered that dangers posed by bioterrorism are not limited to humans but extends to environment as well. These weapons leave irreversible scars on the environment we live it, sometimes making it completely inhabitable. These weapons affect other facets as well such as economies, social and mental trauma.

The world has witnessed an increase in debate on the issue as to which other rights constitutes as fundamental human rights. Amongst these the article focusses on the issue of right to environment and the challenges posed by bioterrorism to this right. The right to environment as a basic human right encompasses respect for the idea of survival of species on this planet. It is keeping this in mind that environment, now is being recognized as a human right. Natural environment includes air, water and land which play a key role in human existence. In order to live a smooth², the quality of our environment should be maintained. Any harm or destruction caused to the environment will end up deteriorating the quality of human life and violations of human rights. This could further have consequences such as loss of access to clean air and water; loss of access to productive land; loss of energy sources and biomass; loss of food and health security; social and economic marginalization, and physical displacement. The wise use of man's ability to transform their surrounding will provides all the communities the opportunity to enhance their quality of life. Although, the ways of nature should also be considered when contemplating these transformations. If applied wrongly or heedlessly these changes can do incalculable harm to human beings and their environment. At the outset, the present article aims to analyze the development of environmental jurisprudence and the role of International bodies engaged in the environmental protection. The article also wishes to analyze the contribution of Indian judiciary to environmental issues, working within the constitutional framework.

Right to Environment: A Basic Human Right

Environment has been accepted as the common heritage of the mankind. Destruction of ecology and environmental degradation gives rise to significant human rights issues. Although, the right to have a clean and healthy environment is the inalienable birth right of all human beings, it has not been recognized under the various Human Rights documents.³ One of the reasons for not giving full recognition to right to environment, as a human right is that the definition of the term 'environment' is very vague⁴ and complex to explain. Another major reason is that the enforcement of environment as a human right would cause great discomfort to the administrators. This is because a declared human right imposes a duty on the state to enforce it and to compensate the person in case of violation of such rights. Another difficult question to comprehend is the nature of the environment right as to whether it can be treated as an individual or collective human right. The individuals by forming organizations can fight against the threats posed by environmental degradations. Only if environmental rights are granted to individuals their right to live with dignity will be truly accomplished. At the same time, one cannot deny the benefit of giving collective status to environmental human right as groups stand on a better footing than the individuals while enforcing the rights. But this complicates the problem of identifying the right holder. A healthy environment forms the pre-requisite for the enjoyment of human rights (implying that the State has the duty to maintain level of

²Sudan, Falendra K, *Encyclopedia of environment and development*, Serials Publications, New Delhi, (2009), p. 394.

³ When UDHR was formulated in the year 1948 it was discussed mainly as political and social rights and in the quest for economic development environmental protection was relegated to a lower priority.

⁴ The term 'environment' takes air, water, land noise, bio-diversity, climate and even the natural surroundings of human and other life forms.

environmental protection which allows full exercise of other essential human rights); In order to make good decisions for the environment certain human rights, especially access to information, participation in decision-making, and access to justice in environmental matters, must be implemented. This portrays that other human rights also play an essential role for environmental protection.

The Stockholm declaration⁵, gave an impetus to the nations to think that the environment must be protected for facilitating the right to life. The concept of right to environment got a legal sanctity in the international sphere. The nineteenth century witnessed the passage of several international conventions⁶, which highlighted the concern for protection of healthy environment and the need to protect environment as a basic human right. Amongst some regional treaties' clean environment as a human right gradually began to find a place. Article 24⁷ of the African Charter on Human and People's Right 1981 and Articles 11⁸ of the Protocol of San Salvador to the American Convention on Human Rights recognize right to have a clean and healthy environment as a human right. The Rio Declaration⁹ states that human beings are the center of concern for sustainable development and sets the goal for establishing a new and equitable global partnership through the creation of new levels of cooperation among state, key sectors of society and people. Rio also declared that both poverty and wealth stressed the environment, that industrial societies must lessen their impact on the environment through sustainable patterns of production and consumption¹⁰. The developed countries should provide assistance to developing countries to build their economies to be environmentally benign.

The law of Human Rights has to confront the never-ending challenges involved in safeguarding human rights. The issue of human deprivation due to developmental activities has become a matter of prime concern in the contemporary human rights discourse. The dependence of human race on environmental base is so fundamental that there can be no two opinions that safe environment is crucial for human life. But it also poses an essential question that does right to Environmental Protection only to protect human life and health and nothing more? Whether the whole human rights jurisprudence can avoid the rights of other co-residents and ecosystems such as animals and flora and fauna and the future generations? In the long run we cannot say that human beings are the absolute owners of the environment even though environmental degradation can be treated as a human rights violation. These arguments ultimately get down to the question of identifying the real right holder. Since the groups cannot function like individuals and the group lacks a definite identity, determination of right holders assumes contextual importance. In such dilemma, it would be advisable to treat the state, as the right holder then the

⁵ Principle I of the Stockholm Declaration states that, man has the fundamental right to freedom, equality and adequate conditions of life in an environment of quality that permits a life of dignity and well-being.

⁶ Vienna Convention on Ozone Depletion, Montreal Protocol and Climate Change Bio-Diversity Conventions 1992.

⁷ This article provides that 'all people have the right to a general satisfactory environment, favorable to their environment'.

⁸ This article recognizes right to environment as an individual human right to live in a healthy environment.

⁹ The historic earth summit held in Rio-De Janeiro in 1992 adopted the Rio Declaration on Environment and Development.

¹⁰ Azad, S.A.K, Sustainable development and environment, Indian Bar Review, 2001 Apr-Sep, Pp. 28(2&3).

corresponding obligation would vest in others. This view is reflected on all the international covenants, which deals with right to development and environment. Most of the domestic legislations have adopted the same policy by putting more responsibilities upon the state to safeguard economy and ecology in a sustainable manner.

Development and Recognition of the Right to Environment

It is now an accepted social principle that all human beings have a fundamental right to a healthy environment, corresponding to a duty ensuring that the resources are conserved and preserved. This should be done in such a way that the present as well as the future generations can have the adequate responsibility to use them equally. Thus, it also bestows a responsibility upon the state governments to preserve and protect the natural resources. The introduction of right to environment as a human right has been the subject of intense legal, philosophical and ethical debate since the early 1970s. It has observed at the international level the development of right to environment as a human right. The right has been recognized under various international documents including the first principle of the Stockholm Declaration (1970), the Rio Declaration (1992) and the Bizkaia Declaration.

The right to development¹¹ obligates the state to adopt developmental policies to usher economic development in the countries. The humans are identified as the beneficiaries of the right to development¹², and the right can be invoked both by individuals and groups. It imposes obligations on both individual States as well as the international community for ensuring equal and adequate access to essential resources. This is required to promote fair development policies and effective international cooperation. Right to development is related with other set of rights, its achievement is dependent upon the realization of all human rights, and development upon maintenance and enhancement of environmental and social quality. Under the concept of sustainable development, both the right to development and the right to environment are complementary aspects to each other. The conflicts generally arise when some nation states, typically under the guise of national development, sanction unsustainable logging, mining and infrastructural development, and fail to provide support for the political and civil rights of local communities marginalized by these activities. Even though, the future generations are not yet in existence, their human rights are already at stake and these violations have begun a long time ago. The future generations have the right to inherit a healthy environment which is blatantly exploited by the present generation. The principle of intergenerational equity¹³ which took a firm place in the contemporary human rights discourse, stood for the fact that even the future generations will need clean air and water, fertile soil and the same eco-systems which the current generations need.

¹¹ The right to development can be rooted in the provisions of the Charter of the United Nations, the Universal Declaration on Human Rights and the two International Human Rights Covenants

¹² Article 1 of the Declaration of Right to Development defines such right as "an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized."

¹³ U...Sarath Chandran, *Human Rights and Environmental Protection*, Cochin University Law Review, (2002), P.177.

The Vienna Declaration on Human Rights of 1993¹⁴ also endorses the idea of right to development. Noting that "democracy, development and respect for human rights and fundamental freedoms are interdependent and mutually reinforcing," it reaffirms the right to development as established in the Declaration on the Right to Development. Thus, reflecting upon the words stated in the Rio Declaration, portrays that the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations. Acceptance of the existence of both a right to development and a right to environment, however, would create the necessary condition for the emergence of a new right to sustainable development. In this context, the Environmental Impact Assessment can prove to be a very progressive tool in developmental planning. In the contemporary context for achieving 'sustainable development' there is no better tool of decision-making than Environmental Impact Assessment.

The International Human Rights Instruments and Right to Environment

When environmental pollution became the subject matter of international law and as the customary international law does offer some modest protection for the environment it mandated the involvement of the United Nations. The international judicial precedents set forth the principle related to the duty of the state not to interfere into the land of neighboring states and right of sovereign states to be compensated for injury resulting from transboundary pollution. The international law related to the environment has evolved rapidly since the 1972 Stockholm conference.¹⁵ The Stockholm conference secured its place in the history of international relations with the adoption of the first global action plan for the environment and triggered an institutional response. This conference has produced a Declaration, list of principles and an Action plan. The Declaration is the masterpiece of international drafting and was not intended to make legally binding provisions, but to be 'inspirational' for national and international actions.

The Stockholm conference recognized the link between environment and development. However, little was done to integrate this concept for international action. Nevertheless, this conference has stimulated public opinion and community participation for the protection of the human environment. Another landmark achievement of this conference is creation of UNEP, a programme designed to protect the environment through global initiative. UNEP was established to identify the global and regional environmental problems and to build consensus on critical environmental issues that the international community needs to address. Since the creation of this new agency,¹⁶ it has been active in encouraging the development of international environmental law, most notably in the areas of ozone layer protection, hazardous waste management and international chemical trade control. Its role is to gather

¹⁴Vienna Declaration and Programme of Action, June 25, (1993).

¹⁵Sumit Roy, "Development, Environment and Poverty: Some Issues for Discussion", Economic and Political Weekly, (1996), p. 31.

¹⁶Vibhute, K.I., "Environment, development and law: Indian perspectives", Journal of the Indian Law Institute, (1995), Jan-Mar, p. 37.

information related to environment, monitoring, assessing and managing world environment as envisioned by Stockholm action plan.¹⁷ UNEP as activator of the Stockholm Action Plan has given the international environmental movement universality, legitimacy, and acceptability in third world countries.

The second international conference at Rio de Janeiro is marked as the largest gathering of the nations, which discussed the dangers threatening our planet and life-support systems. The outcome of this conference was five important key agreements. These agreements advocate for the integration of enhanced socio-economic developmental plans while conserving a healthy environment. The conference decided to work towards protecting the integrity of global environment and development. This conference concluded that development must become sustainable to ensure that the needs of the present generation are fulfilled without jeopardizing the prospects of future generation.¹⁸ The Rio conference has made modest attempt to evolve policies and institutional mechanisms for sustainable development. The work drew public attention and represented¹⁹ another major step towards achieving consensus among the nations on the issue related to environmental degradation. The two major international conferences have provided guiding principles for the governments around the world for formulating national policies and enacting legislations for the protection of environment. They have also set the objectives for future international cooperation and planning. However, there is little initiative to develop the international law of liability and compensation. Unfortunately, the pace of achieving a sustainable future is very slow.

6.3.3 The Regional Human Rights Arrangements on Right to Environment

The regional protection of environmental law was started in the mid-1960s. During this period, innumerable disasters happened in various parts of Europe which raised a global concern about the serious repercussions of environmental pollution.²⁰ Simultaneously, major international environmental organizations were created. These organizations successfully focused media's attention on the environmental crisis and lobbying governments at all levels to take effective action. The early environmental movement culminated with the birth of international environmental law which is the 1972 Stockholm Declaration on the Human Environment. The Stockholm Declaration introduced for the first time in international law right to environment as human right. The principle states that:

Man [sic] 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.²¹

¹⁷ Arora, Guljit K, "Environment, population and development issues in countries in the emerging global world", India Quarterly, (1995), Apr-Sep, p. 51.

¹⁸ Madhava Menon, "Right to development, clean environment and work", C.U.L.R, (1999), May-Jun, Pp: 1-36.

¹⁹ Choudhury, D.P, "Sustainable development and environment", Cuttack Law Times, (2001), P 93.

²⁰ S. Bhatt, *Environment protection and sustainable development*, APH Publishing Co, New Delhi, (2004), p. 241.

²¹ *Id* at 196.

Regionally, a lot of controversies existed for the inclusion of 'right to environment within the realm of Human Rights jurisprudence'. The ecologists and eco feminists had a different notion of treating right to environment as an absolute, stable individual right rather than a collective right.²² The proponents of the human rights views strongly argue that 'human beings are the real owners of the environment and they maintain a symbiotic relationship with the environment'. As Dinah Shelton has observed, however, "humans are not separable members of the universe. Rather, humans are interlinked and interdependent participants [in the natural world]".²³ Thus, the inclusion of 'right to environment within the realm of human rights jurisprudence was accepted by the global community in the twentieth century.²⁴

On similar lines, the 1989 Hague Declaration on the Environment declared that environmental degradation threatens "the right to live with dignity in a viable global environment." Following this, the United Nations General Assembly passed a resolution²⁵ which recognized that all individuals are entitled to live in an environment adequate for their health and well-being. It also called upon the member states and intergovernmental and non-governmental organizations to enhance their efforts towards ensuring a better and healthier environment. It was the UN-sponsored Rio Conference on Environment and Development²⁶ which stated that "the human beings are at the center of concerns for sustainable development and they are entitled to a healthy and productive life; living in harmony with nature". The Rio Declaration provides a strong evidence of a customary international rule recognizing the right to environment. After this the Bizkaia Declaration on the Right to the Environment²⁷ declared that "everyone has the right, individually or in association with others, to enjoy a healthy, ecologically balanced environment which may be exercised by both public bodies and private entities". Altogether, Principle 1 of the Stockholm Declaration and the Rio Declaration's recognition of environmental entitlement, regional recognition of the right to environment, UN General Assembly Resolution 45/94, incorporation of the right to environment in national constitutions proves that all human beings have the right to live in a healthy environment.

At the regional level the two significant legal instruments which recognizes the right to environment as a human right are the African Charter on Human Rights and the Additional Protocol to the American Convention on Human Rights. The African Charter on Human and Peoples Rights states that "all peoples have the right to a general satisfactory environment favorable to their development."²⁸ Likewise, the additional Protocol to the

²² M.F Thomas, (ed.), *Environment and land use in Africa*, Methuen London, (1969), p. 554.

²³ Dinah Shelton, "Human Rights, Environmental Rights, and the Right to Environment", *Stanford Journal of International law*, (1991), p. 103.

²⁴ Sandhya Venkateswaran, *Environment, development and the gender gap*, Sage Publications, New Delhi, (1995), p. 236.

²⁵ U N Resolution 45/94.

²⁶ UN-sponsored Rio Conference on Environment and Development, 1992.

²⁷ Bizkaia Declaration on the Right to the Environment, 1999.

²⁸ Article 24 of the African Charter, 1986.

American Convention on Human Rights in the area of Economic Social and Cultural Rights recognizes the right to a healthy environment.²⁹

Justifiability of Right to Environment and Obligations of Nation States

There is no doubt that Human rights are core fundamental rights, the other rights stems from these rights.³⁰ Human rights and environmental protection are interdependent. A safe, clean, healthy and sustainable environment is necessary for the full enjoyment of human rights. This includes the right to life; to physical and mental health; to adequate standard of living, to adequate food, to safe drinking water and sanitation, to housing, to participating in cultural life and to development, as well as the right to a healthy environment itself, which is recognized in regional agreements and most national constitutions.

At the same time, the exercise of human rights including the right to freedom of expression and association, to education and information, and to participation and effective remedies, is vital for the protection of the environment. It is the obligation of the States to respect human rights, to protect the enjoyment of human rights from harmful interference, and to fulfil conditions for full realization of human rights all apply in the environmental context. States should therefore refrain from violating human rights by causing or allowing environmental harm; protect against harmful environmental interference from other sources, including business enterprises, other private actors and natural causes. It should take effective steps to ensure conservation and sustainable use of the ecosystems and biological diversity on which full enjoyment of human rights depends.³¹ While it may not always be possible to prevent all environmental harm that interferes with the full enjoyment of human rights, states should undertake due diligence to prevent such harm and reduce it to the maximum extent possible and provide for remedies for any remaining harm.

The States must fully comply with their obligations in respect to human rights, such as freedom of expression in relation to the environment. Such obligations not only have independent bases in human rights law; they are also required in order to respect, protect and fulfill the human rights whose enjoyment depends on a safe, clean, healthy and sustainable environment.³² States have obligations to protect against environmental harm that results from or contributes to discrimination, to provide for equal access to environmental benefits and to ensure that their actions relating to the environment are not discriminating. In the environmental context, direct discrimination may include, for example, failing to ensure that members of disfavored groups have the same access to information about

²⁹Article 11 of the Protocol of San Salvador, 1989.

³⁰Jaswal, P.S. and Nishita Jaswal, *Environmental law, environment protection, sustainable development and the law*, Pioneer Publications, New Delhi, (2012), p.123.

³¹Agrawal, V.P. and Rana, *Science, development and environment*, Mujaffar Nagar, Society of Biosciences, (1987), p. 332.

³²World Commission of Environment and Development Our common future., Delhi: OUP, (1987), p. 383.

environmental matters as others, for participating in decision-making on environmental issues, or to remedies for environmental harm.³³

In the case of transboundary environmental harm, States should provide for equal access to information, participation and remedies without discriminating on the basis of nationality or domicile. Indirect discrimination may also arise, for example, when certain activities adversely affect ecosystems, such as mining and logging concessions. These have severe effects on communities that rely on the ecosystems for their livelihood. Indirect discrimination includes authorizing toxic and hazardous factories to set up in areas where minority communities are residing thereby disproportionately interfering with their rights,³⁴ including their rights to life, health, food and water. Like directly discriminatory measures, such indirect differential treatment is prohibited unless it fulfills strict requirements of legitimacy, necessity and proportionality. More generally, to address indirect as well as direct discrimination, States must pay attention to historical or persistent prejudice that has existed against groups or individuals. It should recognize that environmental harm can both result from and reinforce existing patterns of discrimination.³⁵

Role of International Bodies engaged in Environment Protection and Conservation

The United Nations Environment Programme (UNEP), World Health Organization (WHO) and Food and Agriculture Organization (FAO) are the main International bodies engaged in environmental protection and conservation. UNEP was created by United Nations General Assembly, as an outgrowth of the United Nations Conference on the Human Environment, held in Stockholm, Sweden that same year. The United Nations Conference on the Environment and Development took place in Rio de Janeiro in 1992 and the World Summit on Sustainable Development, held in Johannesburg in 2002 (also known as RIO+10) did not substantially change UNEP's configuration. It is headquartered in Nairobi (Kenya). UNEP's main objective is to coordinate the development of environmental policies for keeping the global environment under review and bring emerging issues to the attention of governments and the international community for action. Its activities cover a wide range of issues encompassing the atmosphere, marine and terrestrial ecosystems. UNEP has played a significant role in developing international environmental conventions, promoting environmental science and information and illustrating ways those can work with national governments, regional institutions and Non-Governmental Organizations (NGOs). UNEP has also been active in funding and implementing environment related development projects for promoting sustainable development and has completed their implementation.

³³ UN framework principles 7, 9 and 10.

³⁴Jilova, C.R, "Sustainable development and environmental protection through judiciary", M.D.U. Law Journal, (2009), Pp. 253-62s.

³⁵Doria, R. (ed.) Man, *Development and environment*, shish publications, New Delhi, (1990), p. 327.

The WHO's constitution states that its objective "is the attainment by all people of the highest possible level of health." Its major task is to combat disease, especially key infectious diseases, and to promote the general health of the people of the world. The World Health Organization (WHO) is one of the original agencies of the United Nations, its constitution formally came into force on the first World Health Day,³⁶ when it was ratified by the 26th member state. The WHO has 193 Member States. The WHO is financed by contributions from member states. The activities conducted by WHO includes coordinating international efforts to monitor outbreaks of infectious diseases, such as SARS(Severe Acute Respiratory Syndrome), malaria, swine flu, and AIDS. It sponsors programs to provide treatment and prevention against such diseases. The WHO supports the development and distribution of safe and effective vaccines, pharmaceutical diagnostics and drugs. After over two decades of fighting smallpox, the WHO declared in 1980 that the disease had been eradicated - the first disease in history to be eliminated by human effort. It aims to eradicate polio within the next few years. In addition to its work in eradicating diseases, WHO is devoting its attention to various health-environment related issues— for example, campaigns to boost the consumption of fruits and vegetables worldwide and to discourage tobacco use. Environment and health are closely related. The Principle of the Rio Declaration on Environment and Development, 1992 states "human beings are at the centre of concern for sustainable development. They are entitled to a healthy and productive life in harmony with nature." Environmental hazards are responsible for an estimated 25% of the total burden of disease worldwide.³⁷

FAO, the specialized agency of the United Nations with the help of its member states undertake international efforts to defeat hunger. FAO serves both developed and developing countries and acts as a neutral forum where all nations meet as equals to negotiate agreements and debate policy³⁸. It is also a source of knowledge and information and helps developing countries and countries in transition to modernize and improve agriculture, forestry and fisheries practices, ensuring good nutrition and food security for all. Its Latin motto, "fiat panis", translates into English as "let there be bread".

India's Stand on the Issue of Bioterrorism

India, amongst many other countries was the early entrant to BWC and ratified the treaty on 15 July 1974. The developments in the past few years have shaped India's stance on the bio terrorism. Firstly, India's sensitivity to anthrax mails. Although most of these incidents were hoaxes but they raise huge concern and alarm.³⁹ Secondly, Osama Bin Laden terrorist group declared India as a chief enemy along with United States and Israel. There have been numerous evidences of the terrorist group's effort to manufacture and acquire biological, chemical and

³⁶ April 1948.

³⁷ Ratna Bharamagoudar, "Towards sustainable development and environment protection", Banaras Law Journal, (2009), Pp. 356-368.

³⁸ Tandon, B.C, *Environment and entrepreneur*, Chug Publications, Allahabad, (1975), p. 131.

³⁹ Chari, P.R, Chandran, Suba. *Bio-terrorism and Bio-Defense*, Manohar Publishers & Distributors, New Delhi, (2005), p 123.

radiological weapons. Thirdly, with new technological advancements, has made genetic manipulation of biological agents and toxins possible. Thus, it would be difficult to control the spread of these diseases. All these factors heightened India's concern towards bioweapons. Further, it is believed that these weapons will not be used by India's known enemies but by the non-state actors. Fearing that these weapons might land in wrong hands, India moved a resolution in the 57th UN General Assembly to sought collective action against the threat of bioterrorism. The concern is also due to India's experience of cross- border terrorism in the areas of Punjab and Kashmir.

Another factor which influences these decisions is that majority of India's population live in vulnerable and unhygienic conditions. It becomes easier targets for most of the enemies as outburst of plague in these areas would lead to unprecedented casualties. The country would have to invest enormous economic, medical and military resources to deter the problems. India is categorized as an agricultural economy and it is likely that the country's livestock and agricultural crops would be targeted by the enemy to achieve its objectives.

While there has been a detailed discussion about the factors was to why India should be concerned bioterrorism, there are two more policies which the country has adopted on international level with respect to bio-weapons. Firstly, the colonial government while acceding to Geneva Convention in 1925 retained the rights to use biological and chemical weapons against those countries that were not party to this agreement or might use weapons against them. This stance was never repealed by the Independent India. Secondly, Article I of the BWC does not prohibit the use pf biological weapons. This implies that India can use bioweaponsif they were used against its territory. It has the option of retaliating with nuclear weapons if biological or chemical weapons are used against the country.

Biological Weapons – A Crucial Means for Terrorism

As mentioned above terrorist groups all over the world have made efforts to acquire and manufacture biological weapons from time to time. These weapons are cost effective and destruction caused by these weapons is magnanimous. It is also difficult to control the effects of these weapons as they do not have a defined boundary and are spread through agents like ai, water, soil etc. Another difficult aspect is tracing the places and people who have encountered the pathogens. While combating the effects of these weapons, time is of the essence, but it is also really important to know about the way the virus or bacteria functions. It has been observed that while fighting such forces most of the time is lost to decipher how these weapons functions ultimately leading to higher degrees of causalities. There are different types of terrorist groups who would resort to using biological weapons. These include groups believing in vague notions about revolutionizing the world like the Red Army of Japan. Groups who are indifferent to public opinions like the emergence of neo-Nazi groups in Europe and North America. Others are

the groups opposed to western society in general, groups sponsored by the state and groups having a high tendency of indiscriminate attacks.

There are four ways adopted by the terrorist to procure these biological weapons. These are: purchasing from legitimate suppliers, investing funds for self- production, using natural material to spread contamination and theft. However, the methodologies to use the weapons vary from organization to organization. These range from poisoning beverages, food or medicines with pathogens to sending infected individuals in crowded areas. All these methods have been tested by the terrorist organizations over period.⁴⁰

The military agencies all over the world have claimed the inexplicable power of biological weapons. For the attacks to be more effective, it is essential the operative military bases are paralyzed. Through this the attacker reduces its enemy's mobility and ability to ask for help. If the military bases are comprised, then it becomes easier to decapitate the population.

However, these tactics are not used by non-state actors during the times of war but also proposed by the military of some countries for defeating their enemies. Countries like USA, Iran and Soviet Union to use these weapons in their warfare operations. States instead of using lethal weapons, use weapons which have a prolonged effect as it reduces the chances of retaliation from a nuclear armed enemy.⁴¹ States have adopted two strategies to avoid retaliation by their enemies which are: attack targeting civilians or enemies' economy. Attacking the citizens of a country puts the government of that country under a lot of pressure. These include either directly or indirectly attacking the citizens. Amongst both, the attackers more often adopt the indirect method as it puts the attacker in a safer position. It is difficult to trace the perpetrators of an indirect attack as a country does not have a single enemy. Also, it is possible to shroud indirect attacks as natural disaster or climate change.

The scientists have speculated that there has been an emergence of diverse biological weapons in the last few years. These include the binary biological weapons, designer genes and life forms, gene therapy weapons, stealth viruses, host swapping diseases and designer disease. Amongst these the most innovative is the designer disease as it involves creation of disease first and then a pathogen is constructed to produce that disease. They function in two ways by either attacking the immunity system of the body and attack certain cells to multiply rapidly or instructing cells to commit suicide known as apoptosis.

⁴⁰ Technical Aspects of Biological Weapons Proliferation, CDC Report, (2016), p.145.

⁴¹ Dr.Mischel M, "Agricultural Terrorism: A View from USA", Directorate of Strategic Analysis in USA, (2006), P.167.

India's Response and Preparation for Bioterrorism

The threats facing India are slightly different from the rest of the world when it comes to bioterrorism. Due to the unhealthy living conditions of the people, it exposes the country to a higher risk of destruction. While most of the developed countries are concerned pneumonic plague, smallpox anthrax etc, much focus should be given to diarrheal diseases as well. More than 70 percent of India's population lives below poverty line. This implies that the people belonging to this category don't care about anything but to arrange for a two-course meal every day. This leads to hygiene being sacrificed and makes the place where they live a breeding ground for diseases. Ultimately, the three factors ignorance, high population and poverty makes these places a live time bomb and a primary target for launching biological weapons.

Another reason why enemies choose such places for launching an attack is because it is difficult to control the effects of these weapons when they are released. The people belonging to the BPL category are generally living in slums on the outskirts of city or are homeless on the street. They don't have a permanent residence and keep migrating in search of work or are displaced by the police to go another place. If a biological weapon is launched in such places it is difficult to keep track of people affected by it and then contain the dangers. The drawback aren't limited to the poverty aspect of the problem but does include the ignorance and apathy on part of governments, medical and public authorities. They have been no initiative taken by any government to improve the conditions of the people living in slums and have focused more on creating "metropolitan cities". Let alone improvement, the state has constantly made efforts to dislocate the people living in these slums for ending "poverty". The state of government hospitals is detestable. Not only dearth of funds but also inefficiency to allocate existing resources contributes to the problem. The annual and monthly budget assigned to the Municipal Corporations by the State government for slum development is squandered to other unimportant projects. All these problems entangle and make developing countries like India an easy target for bioterrorism attacks.

The majority of India's working population has been employed in the primary sector which is the agricultural sector. Even through the sector's contribution to the GDP hasn't been significant since the industrialization era in India; it still is a significant component of the economy. Apart from the agricultural sector, animal sector is also an important sector for the economy. The biological weapons consist of weapons for introducing diseases among animals and plants. These can be either injecting pathogen in an animal and then sending it amongst the same breed or pest infestation in the crops. These activities would give a massive to the attacked country's economy.

The pneumonic plague of Surat is considered as an experiment of biological weapons by the US military on the Indian soil.⁴² However, there are certain claims made against this accusation. During the entire incident the fact that needs the utmost focus is that India is ill prepared for a bio-terrorist attack. Learned Indian scientist like Kamal Dutta has warned that the country is not ready for any biological attack. He informed that India does not have any stock of smallpox vaccine. It has been claimed by many all over the world that smallpox is still a threat to humankind as it is one of the deadliest biological weapons. The story of unpreparedness extends to both developing as well as developed countries. No scientist can claim that they are fully prepared to counter a biological terrorist attack. There is an insufficient stock of vaccines for already existing and known pathogens, let alone countering a biological attack. It is to be noted that the developing countries are at a greater loss than the developed countries as they lack funds, technology, efficiency and planning. As we are aware of the dangers posed by biological weapons, there are ways by which we can prepare ourselves for such an attack. The first step is that the government should take initiative in order to spread awareness about biological weapons and the dangers posed by them. Awareness should also be spread how unhealthy living conditions serve as a target for such attacks. There is need for active measures on part of the government for improving the living conditions of the slums. Efforts should be made for stockpiling enough drugs and vaccines which might be required during an urgent outbreak. Developed countries like India should allocate funds for research on such weapons and formulation of plans in times of contingent situations. All the government laboratories should be computerized integrated, so all the laboratories have access to research work of each other and create a pool of knowledge for further research.⁴³

Right to Environment; a Jurisprudential Analysis

The emergence of the right to environment can be traced to the Natural School of Jurisprudence. The concept of 'natural rights' articulates that certain inalienable basic rights were gifted to man by the nature.⁴⁴ The legal rights granted by environmental law to the citizens remind the need for judicious usage of our natural resources and warn that overuse of these resources will lead to ecological damage including pollution.⁴⁵ The underlying philosophy behind the recognition of right to environment as a natural right is the concept of ecological governance. This requires the humans to mould their life in such a way as to suit to nature's limits. It advocates that nature be granted the same rights to flourish and maintain themselves as humans do in their legal structures. The principle regarding the need for legal protection is the concept that humans and nature are in a relationship. It states

⁴² Dr. Syaed Maswood, "Article 21 and Right to Pollution Free Environment: A Human Right Approach", Central India Law Quarterly, (2001), 55.

⁴³ *Ibid.*

⁴⁴ Dr. M. Ponnain, "Healthy Environment- A human Right", the PRP Journal of Human Rights, (1997), P.4.

⁴⁵ T. Sitakumari, *Right to Clean Environment-Basic Human Right*, the PRP Journal of Human Rights, (2003), P.17.

that nature doesn't merely provide hoards of natural resources for indiscriminate human use.⁴⁶ The legal structure discussed in Rights of Nature literature codifies the details of this restored relationship, rather than creating it.

The Constitutional Foundations of Right to Environment

There is no express mention of 'right to environment' under the Constitution of India.⁴⁷ Nevertheless, the Constitution places a duty upon the State to ensure certain basic social and economic rights for the welfare of the people.⁴⁸ The Directive Principles of State Policy explicitly states that the state must make effective provisions for protection and preservation of quality of environment which improves quality of life.⁴⁹ There are certain provisions on environment protection in the constitution are the outcome of the emerging nature of Indian Constitution.⁵⁰ The preamble to our constitution ensures socialist pattern of society and dignity to each individual. Decent standard of living and pollution free environment is inherent to the values stated. The Environment (Protection) Act, 1986 defines environment as "environment includes water, air and land and the interrelationship which exists among and between air, water and land and human beings, other living creatures, plants, micro-organism and property".

The fundamental duties mentioned in the Indian Constitution impose duty on every citizen to protect environment. Article 51-A (g), says that, "It shall be duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures." The Directive Principles under the constitution advocate for building welfare state. Article 47 provides that the State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties. The improvement of public health includes the protection and improvement of environment, without which public health cannot be assured. Article 48 deals with organization of agriculture and animal husbandry.⁵¹ It directs the State to take steps to organize agriculture and animal husbandry on modern and scientific lines. It should take steps for preserving and improving the breeds and prohibiting the slaughter of cows and calves and other milch and draught cattle. Article 48 -A of the constitution says that "the state shall take endeavor to protect and improve the environment and to safeguard the forests and wild life of the country".

⁴⁶U.Sarath Chandran, "Human Rights and Environmental Protection", C.U.L.R, (2002), p. 177.

⁴⁷Shekhawat, "Sustainable development and environment", *Journal of the Legal Studies*, (2008), Pp. 285-89.

⁴⁸ *Supra* Note. 47.

⁴⁹Sitakumari, "Right to Clean Environment- Basic Human Right", *The PRP Journal of Human Rights*, Pp. 15- 20.

⁵⁰Sheweta Deshpande, "Environment and sustainable development: An analysis", *Indian Socio-Legal Journal*, (2008), pp. 83-90.

⁵¹Sudhanshu Tripathi, "Environment and sustainable development in South Asia", *India Quarterly*, (2007), pp. 123-44.

Part III of the Constitution guarantees fundamental rights which are essential for the development of every individual and to which person entitled to by virtue of being a human. Right to environment is also a right without which development of individual and realization of their full potential is not possible. Articles 14, 19, 21 of the Constitution have been used for guaranteeing environmental protection. According to Article 21 of the constitution, “no person shall be deprived of his life or personal liberty except according to procedure established by law”. Article 21 has received liberal interpretations from time to time like the Supreme Court’s decision in *Maneka Gandhi v. Union of India*, (AIR 1978 SC 597). An environment free of danger of disease and infection is inherent to the right to life. Right to healthy environment is an important attribute of right to live with human dignity. The right to live in a healthy environment as part of Article 21 was first recognized in the case of *Rural Litigation and Entitlement Kendra vs. State*, AIR 1988 SC 2187 (Popularly known as Dehradun Quarrying Case). The case involves issues relating to environment and ecological balance, in which Supreme Court directed to stop the excavation (illegal mining) under the Environment (Protection) Act, 1986. In *M.C. Mehta vs. Union of India*, AIR 1987 SC 1086, the Supreme Court treated the right to live in pollution free environment as a part of fundamental right to life under Article 21 of the Constitution.

Excessive noise is also a source of pollution in the society. The constitution of India under Article 19 (1) (a) read along with Article 21 of the constitution guarantees right to decent environment and right to live peacefully. In *PA Jacob vs. The Superintendent of Police Kottayam*, AIR 1993 Ker 1, the Kerala High Court held that freedom of speech under article 19 (1)(a) does not include freedom to use loudspeakers or sound amplifiers. Thus, noise pollution caused by the loudspeakers can be controlled under article 19 (1) (a) of the constitution. Article 19 (1) (g) of the Indian constitution confers fundamental right on every citizen to practice any profession or to carry on any occupation, trade or business. However, this is subject to reasonable restrictions. A citizen cannot carry on business activity, if it poses a health hazard to the society or general public. Thus, taking necessary safeguards for environment protection are essential. The Supreme Court, while deciding the matter relating to carrying on trade of liquor in *Cooverjee B. Bharucha Vs Excise commissioner, Ajmer* (1954, SC 220) observed that, if there is clash between environmental protection and right to freedom of trade and occupation, the courts have to balance environmental interests with the fundamental rights to carry on any occupation.

Public Interest Litigation under Article 32 and 226 of the constitution of India resulted in a wave of environmental litigations.⁵²

At local and village level, Panchayats have been empowered to take measures such as soil conservation, water management, protection of forest and promotion of ecological aspect. Environmental protection is part of our

⁵² The leading environmental cases decided by the Supreme Court includes case of closure of limestone quarries in the Dehradun region (*Dehradun Quarrying case*, AIR 1985 SC 652), the installation of safeguard at a chlorine plant in Delhi (*M.C. Mehta v. Union of India*, AIR 1988 SC 1037) etc. In *Vellore Citizens Welfare Forum v. Union of India*, (1996) 5 SCC 647, the Court observed that “the Precautionary Principle” and “the Polluter Pays Principle” are essential features of “Sustainable Development.”

cultural values and traditions. In Atharvaveda, it has been said that “Man’s paradise is on earth; this living world is the beloved place of all; It has the blessings of nature’s bounties; live in a lovely spirit”. The verse refers to Earth as our paradise and it is our duty to protect our paradise. The constitution of India embodies the framework of protection and preservation of nature without which life cannot be enjoyed. The knowledge of constitutional provisions regarding environment protection is highly significant in order to generate greater public participation, environmental awareness, and environmental education and sensitize the people to preserve ecology and environment.⁵³

Legislative Approaches Towards ensuring Right to Environment

The main environmental laws in India include the:

Water (Prevention and Control of Pollution) Act 1974 (Water Act), which also initially identified the powers, functions and hierarchy of the environmental agencies, the CPCB and the SPCBs. Air (Prevention and Control of Pollution) Act 1981 (Air Act). Another is the Environment (Protection) Act 1986 (EP Act). This umbrella law enables the central government to take measures it deems necessary to protect and improve the environment, and to prevent, control and abate environmental pollution.

A wide range of rules and notifications have been adopted under it, such as the:

- E-Waste (Management) Rules 2016, as amended in 2018 (E-Waste Rules);
- Bio-Medical Waste Management Rules 2016;
- Plastic Waste Management Rules 2016;
- Solid Waste Management Rules, 2016;
- Construction and Demolition Waste Management Rules 2016;
- Hazardous and Other Waste (Management and Transboundary Movement) Rules 2016, as amended in 2019 (HW Rules);
- Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 (MSIHC Rules);
- Coastal Regulation Zone Notification 2019; and
- Environment Impact Assessment Notification 2006.

Other environmental related laws are:

- Wildlife (Protection) Act 1972.
- Forest (Conservation) Act 1980.
- Public Liability Insurance Act 1991.

⁵³Kakar, Anjana, “Development of environment, ethics and human rights: Role of judiciary”, Journal of the Legal Studies,(2006), Diamond publications, pp.186-98.

- Biological Diversity Act 2002.
- National Green Tribunal Act 2010.

Judicial Interpretations on Right to Environment

The courts have had a major contribution while interpreting the right to environment as a fundamental right. The court in several cases has challenged many developmental activities as posing danger to the environment and resulting in mass human rights violations. They have taken note of the Environmental Impact Assessment statements but not have gone to the qualitative aspects of the matter. Certain developmental activities are inevitable for the total progress of the country even if may raise serious repercussions in the form of environmental degradation. In India, Public Interest Litigation (PIL) and judicial activism have played significant role in creating environmental consciousness and concern.

The Andhra Pradesh High Court in *Damodar Rao v. Municipal Corporation, Hyderabad*⁵⁴ held that the environmental protection is not only the duty of the citizen under Article 51A(g) but also the obligation of the state under Article 48-A of the Constitution. In this case, the court observed that, enjoyment of life and its attainment and fulfillment guaranteed by Article 21 of the Constitution embraces the protection and preservation of nature's gift without which life cannot be enjoyed. Again in *L.K.Koolwal v. State*⁵⁵, the Rajasthan High Court held that the Article 51-A can ordinarily be called a duty of the citizens but is in fact the right of the citizens. It creates a right in favor of the citizens to move the court to ensure that the state performs its duty faithfully and that obligatory and primary duties are performed in accordance with the law of the land. The court also observed that the maintenance of public health, preservation of the sanitation and environment falls within the purview of Article 21 of the Constitution. In *M.C.Mehta v. Kamalnath*⁵⁶, the Supreme Court once again affirmed that any disturbances with basic elements of environment like air, water and soil which are necessary for life would be hazardous to life within the meaning Article 21 of the Constitution. The person guilty of causing such pollution must pay damages for restoration of the environment and the ecology.

In few cases the judiciary realized the urgent need to address the environmental issues and issued directions for protecting environment by practicing the writ jurisdiction. In *Rural Litigation Kendra and Entitlement Kendra v. State of Uttar Pradesh*⁵⁷, the Supreme Court wanted information on whether indiscriminate mining under a legally valid license, caused an adverse impact on the ecology. Several committees consisting of experts were appointed to look into the question. Based on their reports certain mining operations were ordered to be closed in phased manner. However, mere changes in the environment does not per se violate right under Article 21 especially

⁵⁴ AIR 1987 AP 171.

⁵⁵ AIR 1988 Raj 2.

⁵⁶ AIR 2000 SC 197.

⁵⁷ AIR 1998 SDC 2187.

when ameliorating steps are taken not only to preserve but also to improve ecology and environment. In *N.D.Jayal v. Union of India*⁵⁸, the construction of Tehri Dam was challenged on the ground that, a proper study regarding the safety aspects of the dam was not done and the concerned authorities did not comply with the conditions subject to which the environmental clearance was granted to the project. The Supreme Court ruled that while taking care environment is an ongoing process but allowed the construction of the dam for taking place. It ordered that relief and rehabilitation measures in consonance with the construction of dam for displaced persons must be implemented properly. In this case the pertinent human rights issue was that, the work of rehabilitation and resettlement of the people was not planned out properly. The court took a stand to not to interfere into the proposed developmental activity and reiterated its earlier decision⁵⁹.

Again, in *Dhonthi Narasimha Reddy v. District Collector*⁶⁰, the petitioner sought to highlight the possible environmental consequences of the *Nandanavanam* project. It was alleged that the project did not comply with the existing environmental regulations. In this case, seeking environmental clearance certificate was necessary which the project had failed to obtain. The court held that the project undertaken by the government neither falls under the categories mentioned in the schedule of the notification. This decision has shown the importance of conducting environmental impact assessment before proceeding to undertake projects, which might have environmental degradations. In *Subhash Kumar v. State of Bihar*⁶¹, the court observed that 'right to life guaranteed by article 21 includes the right of enjoyment of pollution-free water and air for full enjoyment of life.' Through this case, the Court recognized the right to a wholesome environment as part of the fundamental right to life. This case also indicated that the municipalities and many other concerned governmental agencies could no longer get away with unimplemented measures for the abatement and prevention of pollution. They may be compelled to take positive measures to improve the environment.

Public hearing is an important precedent condition for granting environmental clearance certificate. The Kerala High Court in *Ravi v. State of Kerala*⁶², quashed the environmental clearance certificate granted to a project as there was no public hearing conducted. In this case, the petitioners challenged the environmental clearance certificate granted to the project along with issues having far reaching environmental consequences such as the impact on drinking water, loss of flora and fauna etc. The court directed the central government to comply with the requirements of Environmental Impact Assessment Notification 1994 as amended by the notification of 1997, which mandated public hearing as a condition precedent for granting environmental Clearance Certificate. In *Centre for Social Justice v. Union of India*⁶³, the Gujarat High Court projected the importance of public hearing in

⁵⁸ AIR 2006 SC 43.

⁵⁹ The Supreme Court in *Sardar Sarovar* case and in *Balco Employee's* case took the stand that when two or more options are possible and the government takes a policy decision it is then not the function of the court to re-examine the matter by way of an appeal.

⁶⁰ AIR 1999 AP 143.

⁶¹ AIR 1991 SC 420.

⁶² 2006 KLT 79.

⁶³ GJLR (3) 1997, 2000.

environmental impact assessment matters. As per the facts of case, the petitioner challenged the way government issued the notification under the Environment Protection Act, 1986. In the concerned matter the grant of the environmental clearance certificate was not being complied with letter and spirit. Another contention raised in this case was that, the Environmental Clearance certificate given by the state government to the respondent was void *ab initio*. The court issued certain guidelines in this regard which are:

- The public hearing should be carried out at a place which would be convenient for the local people to participate
- Public notice for such public hearing should have wide circulation in the concerned local area
- The summary of the EIA report should be made available to the interested parties in lieu of nominal charges
- Grievances about the Environmental Clearance Certificate can be filed by way of an appeal under the National Environmental Appellate Authority Act, 1997.

The non-interference by the Indian courts in majority of these environmental vis-à-vis human rights issues indicated the immediate need to establish environmental courts⁶⁴, which should consist a body of technical experts to handle the technicalities involved in the environmental impact assessment process.

Effects of Bioterrorism on Environment

There is a longtime negative impact on the ecology due to any kind of warfare. It is imperative the nations beware and alert all the time due to the destructive capacities of these weapons. The nations should have contingent plans in place for emergency situations. The numerous types of bioweapons have different ways of harming the environment. Amongst the bioterrorism, the agricultural terrorism or agro terrorism is what endangers India the most.

Environmental degradation has been detrimental in reemergence of some of the deadliest diseases in the world. Global warming, loss of biodiversity, improper waste disposal, deforestation, genetic mutation of species had led to occasional attacks of virus infection in plants, animal and humans. Old diseases like malaria, tuberculosis have developed a resistance to antibiotics. Every year the country witnesses the outbreak of viral and unknown fever, especially during monsoon season. About 30% of the people lose their lives due to these outbreaks. Unhealthy living conditions are also responsible for such outbreaks. Man's habit of tampering with the natural environment has led to irreversible damages to the environment. Amongst many of such inventions, genetically modified seeds have caused soil pollution in different countries of the world. They have caused growth of giant and

⁶⁴ The 186th report of the Law Commission indicated the need for the establishment of such environmental courts.

wild weed population known as the “super weeds.”⁶⁵ A lot of people have complained about allergic reactions due to these weeds. It is also expected that these seeds can lead to the elimination of natural population because of introduction of microbes and plants. Certain organizations have claimed that the antibiotic resistance gene in these genetically modified organisms may cause these organisms to develop resistance against the existing antibiotics for plant and animal diseases.⁶⁶

Agro terrorism is use of pathogens against agricultural targets like livestock, water resources and crops to cause destruction to cause social, economical and political chaos in order to achieve an aim. The weapons that can be used by organizations are either already existing or are genetically modified. The heaviest burden of such kind of destruction falls on the farmers of the developing countries. These farmers are already suffering from problems like drought, globalization, lower prices and liberalization. Agro terrorism becomes another factor which disrupts the livelihood of the farmers.

Most of the terrorist and state sponsored organizations prefer this kind of bioterrorism because of the pathogen’s easy availability. The pathogens used for transfer diseases are contagious and easily transferable. The cost of delivery and logistics is negligible. There is an option to contaminate the plants from the stage of germination to cause destruction. The natural advantage shared by all biological weapons is the delay in detection of the cause. When such diseases first emerge, they seem to be caused due to the natural environmental causes. But even after conducting further research about the cause, the development of the vaccines for such diseases take a long period of time. During this period the weapon claims a lot of lives and cause widespread economic destruction.

The economic destruction caused by agro terrorism is a less spoken aspect of bioterrorism. The primary sector is a significant sector for most of the developing countries. The sector does not operate in isolation and many sectors are dependent on this sector for sustenance. Some of the sectors are slaughterhouses, stockyards, transport, breeding farms and packaging industry. It is a strategic move to harm the country’s economy as it puts the perpetrator in a position of power. This provided the perpetrator with an opportunity to fulfill his demands by threatening the attacked country. There is also a lot of pressure from the people of the attacked country on their governments. They want the government to find a quick and effective solution to the problem, but the solution lies in the hand of the perpetrator.

There have been numerous cases of agro terrorism that have been documented worldwide. It is not necessary that biological war can be waged by directly attacking the plants or animals by injecting them with the pathogen causing disease. War can also be declared by introduction of alien plants and animals. The case of Lake Victoria in Africa is an example of this kind of terrorism. The choking water hyacinth plant was introduced in the lake as a decorative plant. The plant became a breeding ground for water snail that carries organisms that transmit diseases such as schistosomiasis and diarrhea. The plant disrupted the livelihood of people of Uganda, Kenya and

⁶⁵ Krishnanyan Sen, “Right to Environment under the Indian Constitution: An Appraisal”, AIR, (2004), P.341.

⁶⁶ Ishrat Hussain, “Sustainable Development and Environmental Protection with Special Reference to Right to Life”, Allahabad Law Journal, (2004), p. 101.

Tanzania who were on dependent on the lake for fish stock. The plant had the ability to multiply rapidly into millions and threatened the lake's fish stock to get extinct in a year. The US Defense Intelligence Agency (DIA) in 1995 started their research on the plant. In order to avoid a water war and political insatiability in these three countries the Global Environment Facility (GEF) along with United Nations Development Programme allotted 20 million US dollars to the countries.

Conclusion

Bioterrorism has and is still threatening to affect our environment in worse way possible. While the world has recognized the significance of identifying right to environment as a fundamental right a lot has to be done to protect this right. The best defense to protect the environment against all harm including bioterrorism is to preserve our ecology from adverse effects of climate change. It is imperative that the governments all over the world should formulate policies to protect the biodiversity. Activities like mining, large scale harvesting of sea animals, deforestation should be reduced. Since most of the biological attacks have been directed through plants and animals, its viable not to introduce genetically modified crops and conserve the indigenous livestock species. The developing countries should make efforts to improve the living conditions in their countries. This would prevent the outbreak of deadly viral and bacterial diseases every year.

India has been a target of a lot of terrorist organization which makes it imperative for the country to formulate a well-grounded policy on bioterrorism. It should use it resources judicially and efficiently to protect the environment as well prepare itself for future attacks. Majority of India's population is dependent on primary sector for their livelihood. The country has also witnessed the outbreak of various diseases in plants and animals which led the economic slowdown. There should be infrastructure development of the laboratories and a central database should be developed which stores the information about new inventions. The goals of sustainable development put forth by international organizations like United Nation should be reflected in India's developmental policies. Even though we can't always be prepared for the future the implementation of these would ensure that our country can reduce the number of casualties in times of emergency.