Role of Education in Waste Management

PUSHPENDRA KUMAR[1], AVINASH KUMAR[2]
[1] *Department of Mathematics, Govt. Degree College, Gosaikheda, Unnao (U.P.)*
[2] *Department of Zoology, D. K. P. G. College Goswa Mallawan, Hardoi (U.P.)*

Abstract- ***The problem of waste is one of the essential issues of the modern civilization, emerging from the contemporary lifestyle. It is a direct consequence of human activity. Global ecological risks manifest themselves in the shortage of natural resources, climate changes, mass pollution of water, air and soil, as well as in endangered biodiversity and waste. They are not hindered by state borders, they are interrelated and normally an occurrence of one risk results in the occurrence of another, sometimes even in a whole chain of risks. But we need systematic approach and huge range of educational methods especially in developing countries like India. Certain level of education in waste management is necessary to have in secondary schools, colleges and universities.***

Indexed Terms- ***Education, Biodiversity, Waste management.***

I. INTRODUCTION

Wastes are unwanted or unusable materials. It may be any substance which is discarded after primary use, or is worthless, defective and of no use. These may be municipal waste includes household waste, commercial waste, and demolition waste; Hazardous waste includes industrial waste; biomedical waste includes clinical waste; Special hazardous waste includes radioactive waste, explosive waste, and electronic waste (e-waste)

The problem of waste management is one of the essential issues of the modern civilization, emerging from the contemporary lifestyle. It is a direct consequence of human activity. Global ecological risks manifest themselves in the shortage of natural resources, climate changes, mass pollution of water, air and soil, as well as in endangered biodiversity and waste. But, implementation of good waste management concepts has to be covered with educational plans. Technology is not enough. We need systematic approach and huge range of educational methods especially in developing countries. Certain level of education in waste management is necessary to have in schools, universities, NGOs, public and private sector, government and local authority level. Paper is focused on education waste main streams.

There have been inadequacies in Solid Waste Management by Municipal authorities in developing countries. This inadequacy has a negative effect on the environment. Improper management of wastes lead to air, water and land pollution and these, pose serious risk to the biodiversity and human health. Municipal authorities have not been able to solely manage this problem hence, the call for more hands and participation by stakeholders.

Daily human activities create waste but the real issue is not the creation of it but how it is disposed and what its effect going on to the people and the environment. Solid waste cannot be eliminated realistically speaking; therefore, the focus should be on the effective management of it. If not properly managed, Solid Waste can pose a major risk to human and environmental health. Municipal Waste Management has proven to be inadequate so for effective dispose of this waste management, a holistic approach to be adopted (Zurbrugg, 2003). In the current system the states government takes the responsibility to manage the wastes of every household. This is good but not efficient because over time, the people have come to assume that waste management is solely the government's duty. For an efficient and effective management, the problem has to be tackled from the individual level. Everyone, every household must be actively involved and NGO for waste management must be involved. This is possible by changing the behavior and attitude of individuals towards waste management and to achieve this, education in any form (talks/lectures/awareness/sensitizations) is necessary. Behavioral and attitudinal change can be

best achieved through education programs with reward systems.

II. IMPACT OF WASTE ON ENVIRONMENT, BIODIVERSITY AND HUMAN HEALTH

Inappropriately managed waste can attract rodents and insects, which can harbour gastrointestinal parasites, yellow fever, worms, the plague and other conditions for humans, and exposure to hazardous wastes, particularly when they are burned, can cause various other diseases including cancers. Toxic waste materials can contaminate surface water, groundwater, soil, and air which cause more problems for humans, other species, and ecosystems. Waste treatment and disposal produces significant greenhouse gas (GHG) emissions, notably methane, which is contributing significantly to global warming. Biodiversity plays an important role in the function of an ecosystem by providing many services like nutrients and water cycling, soil formation and retention, resistance against invasive species, pollination of plants, regulation of climate, as well as pest and pollution. Biodiversity is also the source of non-material benefits like spiritual and aesthetic values, knowledge system, cultural diversity and spiritual inspiration (Prakash and Srivastava, 2019). Climate change refers to variations in the global climate or regional climate over a long time period that influences the cropping pattern and agriculture (Mandal and Singh, 2020).

Assessment of biodiversity impacts on ecosystems and communities is needed to be elucidated and should be sustainable farming oriented (Verma, 2017, 2018a, 2018b). Anthropogenic activities such as overexploitation of natural resources are largely creating the threats for biodiversity including fishes, vertebrates and chordates (Kumar and Verma, 2017; Verma, 2018c, 2018d, 2020a, 2020b; Prakash, 2020a, 2020b; Prakash *et al*, 2020). There are some however the benefit of air pollution for instance, appearance of many aphids are stimulated by air pollutants. Other species are resistant to them and expand to fill the space left by the disappearance of more sensitive kinds. Noise pollution has the potential to affect the physiology, behaviour and reproduction of a range of animal taxa. Types of effects include changes in foraging and reproductive behaviour, reduction in animal fitness, increased risk of predation and reduced reproductive success (Maheshwari *et al*., 2020).

That lack of environmental education in forms of teachings and awareness about waste management and ignorance of the harmful effects on man and the environment has further complicated the problem. Thus waste management becomes a significant environmental justice issue. However, lockdown following the Covid-19 caused the (1) reduction in wastes and pollution (2) environment clean (3) global biodiversity to flourish (Kumari and Shukla, 2020; Verma and Prakash, 2020; Roy *et al.*, 2020).

III. CURRENT CHALLENGES

The increasing awareness and consciousness among common people are directly related with environmental management and sustainability. In developing countries, Solid Waste Management is becoming increasingly difficult as it is in most cases solely managed by Municipal authorities, only little amounts of generated wastes is collected and the rest are burned or dumped in any available space in the environment (Ahmed and Ali, 2004). The waste generated as a result of increased consumption of resources can be very harmful to human and environmental health (Frosch, 1996).

There is inadequate data on wastes in most developing nations and this must be address seriously. According to Rada *et al.* (2018), there is need for a proper system of data generation year after year for each area where there is municipal waste management. The effects of improper waste management including blockage of drainages which encourage flooding, discarded waste serving as breeding grounds for disease vectors (UNDP, 2007) should also be noted. Food waste management is gradually becoming a serious challenge in developing nations; it poses itself as a threat to sustainable development. As a result of the inadequate and inefficient food waste management systems on-ground in most developing countries, these countries are left to deal with sanitary and environmental problems (Thi *et al*, 2015). The idea of compost to manage food waste has not yet been fully adopted in developing countries.

IV. NEEDS OF EDUCATION AND AWARENESS

Education and awareness in the area of waste and waste management is increasingly important from a global perspective of resource management. Local, regional, and global air pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of "green house" gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. Several universities started environmental management and waste management programs.

Educational partnership with teachers, NGOs, government and citizens can set and implement sustainable waste and recycling initiatives. Schools and local community with NGOs can be a network for information distribution and platform for changing the habits. Promoting the awareness and understanding of waste educational centers should send clear picture about waste characterization, waste methods like composting at home, waste collecting, health problems and etc. It is possible to achieve true different media like TV, radio, posters, displays, brochures, web site, public events, using national promotional campaigns, working with community groups, spreading the waste and recycling massage in a fun and interactive way.

CONCLUSION AND RECOMMENDATION

In India, there is a huge gap between the level of awareness and education of the people on waste management and the level of awareness and education they should have. The gap can easily be bridged by an introduction of environmental education into the curriculum at the secondary and higher secondary school level. The reason for opting for its introduction at the secondary school level is because after the higher secondary school education, individuals go to the degree colleges and universities to study the specialized courses and so, may never come across the needed basic environmental education and awareness. The government needs to do more with regards to awareness on environmental issues. The government must take on the responsibility of educating the general public through posters, rallies, and mass media on pollution, waste management and environmental protection. The people must be educated through all the possible ways to minimize or reduce waste. Once the people are aware of the consequences of waste in the environment and have been educated on measures to combat and reduce it, they complement the efforts of the municipal authorities.

To further enhance waste management, the government should adopt a community-based approach in addressing the challenge. The people should be a part of the project, they should view is as their responsibility and as a way to improve their standard of living. They should also be educated on recycling and reuse. This will improve waste handling. The role of environmental education is to create a positive change in the attitude of the people towards waste management. Without environmental education, more time and resources will be committed to waste management in futility. Future research and studies will look into ways to convert waste to energy for the benefit and use of the society. More awareness in this regard should be required. The solutions of waste management should not only be environmentally sustainable but also cost-efficient and socially acceptable (Verma, 2019; Malinauskaite, 2017).

Ecological problems and limited natural resources significantly contribute to the affirmation of the meaning and role of waste management in the developing countries. Knowledge about waste, its impact to health and environment need systematic educational approach and huge range of educational methods. Certain level of education in waste management is necessary to have in schools, universities, NGOs, public and private sector, government and local authority level, but the key rule have national governments in creating legal, institutional and economic conditions for sustainable waste management systems. For waste management it is necessary that central and state governments should be start the educational activities by establishing educational centers at local level under the control of NGOs, degree colleges and municipalities. It will change the minds in the way that waste is a resource, not a problem, and that with proper management

society can benefits. It is a long-time process but in the same time very creative and full of opportunities.

REFERENCES

[1] Ahmed, S.A, Ali, M. (2004). Partnerships for solid waste management in developing countries: Linking theories to realities. *Habitat International*. 28: 467-479.

[2] Frosch, R. (1996). Toward the End of Waste: Reflections on a New Ecology of Industry. Daedalus MIT press, 125: 199-212.

[3] Kumar Ajay and Verma A. K. (2017). Biodiversity loss and its Ecological impact in India. *International Journal on Biological Sciences*. 8(2): 156-160.

[4] Kumari Tamanna and Shukla Vineeta (2020). Covid-19: Towards Confronting an Unprecedented Pandemic. *International Journal of Biological Innovations*. 2(1):1-10.

[5] https://doi.org/10.46505/IJBI.2020.2101

[6] Maheshwari, R.K., Poonia, R., Rathore, M.S., Kakodia, A. K., Kumar, A., and Sharma, S. (2020). Clinical Manifestations and Protective Measures of Environmental Noise: An Overview. *International Journal of Biological Innovations*, 2(1). 42-51. https://doi.org/10.46505/IJBI.2020.2106

[7] Malinauskaite J, Jouhara H, Czajczynska D, Stanchev P, Katsou E, *et al.* (2017). Municipal solid waste management and waste-to-energy in the context of a circular economy and energy recycling in Europe. Energy 141: 2013-2044.

[8] Mandal A.C. and Singh O.P. (2020). Climate Change and Practices of Farmers' to maintain rice yield: A case study. *International Journal of Biological Innovations*. 2(1): 42-51. https://doi.org/10.46505/IJBI.2020.2107

[9] Prakash, S. (2020a). Fish diversity of Semara Taal, a wetland of district Siddharthnagar (U.P.), India. *International Journal of Fisheries and Aquatic Research*. 5(2):07-09.

[10] Prakash S. (2020b). Conservation status of fishes reported from Semara Taal of District Siddharthnagar (U.P.). India. *International Journal of Fauna and Biological Studies*. 7(3): 21-24

[11] Prakash S. and Srivastava S. (2019). Impact of Climate Change on Biodiversity: An Overview. *International Journal of Biological Innovations*. 1(2): 60-65. https://doi.org/10.46505/IJBI.2019.1205

[12] Prakash, S., Kumar, A., Prakash, S. and Mishra, B.K. (2020). A Survey of Fish Fauna of Rapti River, Balrampur (U.P.), India. *International Journal of Biological Innovations*, 2(1). 76-81. https://doi.org/10.46505/IJBI.2020.2110

[13] Rada EC, Zatelli C, Cioca LI, Torretta V (2018). Selective collection quality index for municipal solid waste management. Sustainability 10: 257.

[14] Roy N., Pal A. and Chaube R. (2020). Covid 19: A Systematic Approach to Combat the Deadly Virus *International Journal of Biological Innovations.* 2 (2): 88-94. https://doi.org/10.46505/IJBI.2020.2202

[15] Thi, N.B.D., Kumar, G. and Lin, C.Y. (2015). An overview of food waste management in developing countries: current status and future perspective. *Journal of environmental management*. 157: 220-229.

[16] UNDP (2007). Structuring and Institutionalizing Solid Waste Management in Penang, Final Report, October, unpublished.

[17] Verma A.K. (2017). Multiple effects of Unsustainable Agriculture. *International Journal on Agricultural Sciences*. 8(1): 24-26.

[18] Verma A.K. (2018a). Unsustainable Agriculture, Environmental Ethics and Ecological Balance. *HortFlora Research Spectrum*. 7 (3): 239-241.

[19] Verma A.K. (2018b). Ecological Balance: An Indispensable Need for Human Survival. *Journal of Experimental Zoology, India*. 21 (1): 407-409.

[20] Verma A.K. (2018c). Vertebrate Biodiversity of Muntjibpur village of Prayagraj. *International Journal on Biological Sciences*. 9 (2): 146-148.

[21] Verma A.K. (2018d). A Biodiversity Survey of Muntjibpur Pond of District Allahabad (U.P.). *International Journal on Environmental Sciences.* 9(1). 56-59.

[22] Verma A.K. (2019). Sustainable Development and Environmental Ethics. *International Journal on Environmental Sciences*. 10 (1): 1-5.

[23] Verma, A. K. (2020a). Conservation status of Anamniotes reported from Balapur Pond of District Prayagraj (U.P.). *Uttar Pradesh Journal of Zoology*. 41(6):42-46.

[24] Verma, A. K. (2020b). Conservation Status of Amniotes found in and around Balapur Pond of District Prayagraj (Uttar Pradesh), India. *International Journal of Biological Research.* 8 (1): 01-05. 10.14419/ijbr.v8i1.30854

[25] Verma A.K. and Prakash S. (2020). Impact of covid-19 on environment and society.

[26] *Journal of Global Biosciences*. 9(5):7352-7363.

[27] Zurbrugg, C. (2003). Urban solid waste management in lowincome countries of Asia-how to cope with the garbage crisis, Sandec publications.