Environmental Protection and Social Work Profession

[Proceeding With Full Paper]

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Table of Contents

Impact of Plastic on Environment and its Abatement Using Social Work Profession

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Introduction:

Ever since the invention of plastic by Alexander Parkes in 1862 in London and its commercial utility innovated by Belgian chemist Leo Baekeland in 1907, it has become an inseparable part of our daily lives. We are surrounded by plastic in one form or other and most common of it is single use plastic. Since it cannot be recycled it pollutes the environment and does not become part of plastic economy. Plastic has no doubt become the ubiquitous workhorse material of the modern economy. Their use has increased twenty times in past 50 years and is expected to double again in next 20 years. In absence of recyclable properties nearly 32% of the plastic generated in the world escapes the collection systems. This provides a huge potential of opportunities that can be tapped to recover losses incurred during this process. Apart from providing employment to people this can also be useful for the environment as the most of the plastic that is lost in the system is single use plastic that has low recycle profits. What is required is a unified approach that will unite the efforts of societies in dealing with this plastic mess before it becomes too late. Social Work methods can be used to create awareness regarding this issue and communities can be motivated to act as change agents. This will require an effort on not only changing the consumption patterns but changing the production patterns as well. Heavy reliance of people on single use plastic can be replaced with other materials that will be less harmful for our environment.

Historical perspective about plastics:

We are surrounded by plastic 24x7. It is present in multiple forms and shapes and is so widely popular because of its shelf life. A normal piece of plastic will stay in this environment will last longer than humanity itself. From the remotest corners of the world to our houses, plastic makes its presence felt. It's not only because of its cheap availability but also because of its wide area of implementation that plastic goods have in past century or so become one of the most used material in the world. Be it common water bottles or furniture, from airplanes to ships plastics have their presence even in the space station. Its durability and resistance to natural degrading elements is one of the major reasons for its intensive use. Moreover, it can be molded into many shapes that makes it popular among industries. How effective or useful is it for the environment is also not a contemporary thought. It was only after the menace of plastic started to impact the wildlife and marine life that the scientists globally started to become aware about the impact that plastic has on our environment. Today almost everyone agrees to the point that plastic is not good for the environment, a stark shift in thinking that was not present when it became the prime material that the industries could depend on apart from all the naturally occurring materials. Its use expanded as the world war began and it became a necessary material that had variety of implementations. Plastic was a cheap and low-cost alternative to rare and scarce materials having ability to be used in multiple applications. United States was the first country to promote its use in industries supplying war logistics. Parachutes, body armor, ropes, helmets, windows for aircrafts among many others. Such was the impact of plastics that its production in united states

grew by 300% during that era. The great depression of 1929 also boosted its use and it replaced almost every other traditional material.

In Rachel Carson's book "Silent Spring" published in 1962 about pesticide use in America and subsequent oil spills in oceans that killed marine life the positivity about industrial use of plastic slowly diminished. Such was the impact of these incidents that plastic became a symbol of cheap characteristic or superficiality. It was also at this time that the impact of plastic was observed in oceans. After the permanent nature of plastics was evident through scientific temper and discussions it was again the plastic industry that came with the solution "Recycling" in 1980's which was a process that was supposed to lessen the burden from environment and again develop confidence among people about this magical material.

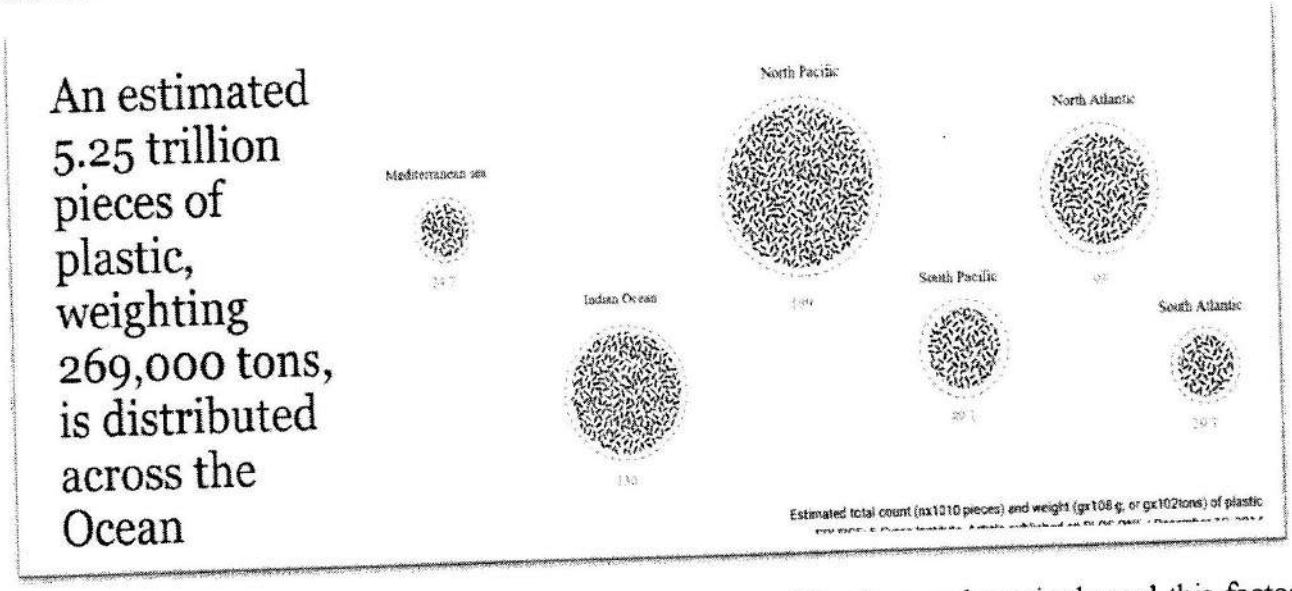
But recycling also came with its constraints. First not all plastic that had been produced could be recycled, secondly this was the time that discussions about climate change and carbon emissions started to take place and lastly its impact on environment and humans became more evident. At present the threat that plastics, microplastics and Nano plastics pose to humans are widely discussed and scientifically explored. It all became problematic as the growth trajectories that the nations are now floating have only been possible because of plastic. It made medical equipment cheaper, provided packaging for food, helped in development of computers, cell phones and also provided cheap raw material to build homes for nearly half the world's population. So, it can be firmly said that though it may have long-term negative impact on environment but real problem is its un-regulated use. This means that the world can still rely on this cheap material for production but only with its judicious and environmentally sustainable use.

Pollution caused by plastic:

Roughly half of the plastic used in the world today is single use plastic which can never be recycled. It usually becomes the part of the environment that we live in and is a major source of pollution. It is mostly dumped in the landfills and most nations in the developing growth trajectories lack means to deal with it sustainably. This causes a major portion of waste collection system in these nations and even in developed nations. It is either burned which again pollutes environment or is covered with sand which pollutes the groundwater resources. Nearly 20% of all crops grown for humanity are dependent on this water source and this dependency is bound to increase in the nearby future as climate change has affected global rainfall patterns too. At present the demand for water doubles every 20 years and if compared to the population growth rate this is almost double of that too. If the pollution of this vital source of water is contaminated at this rate the demand will surpass its availability by 56% and nearly 1.8 billion people will be living in water scarcity by 2025. These numbers are in themselves a cause of worry. The highly impacted nations will be those that lack means and technology related to desalinization and this will lead to mass distress throughout the world. The water that is needed to grow our crops passes the contaminants into the produce and will finally make its way into the food chain. Recent studies about Microplastics and Nano Plastics have suggested that these particles may have contributed to emerging trend of cancer in humans. This may lead to a grave crisis that if not quarantined now will leave the entire world in a catastrophe. In the growing dependence on globalization and trade between nations the impact that this issue will have in the upcoming future is without any doubt unprecedented and unpredictable. This is an issue that will leave the entire mankind in a situation of crisis.

The second most important impact that the plastic has is on marine life. Nearly 4.3 billion people in the world today rely on fish for 15% of their protein intake. We have all seen pictures of marine life affected by ocean pollution. The water in seas and oceans is not stationary and is instead moving in ocean currents. This leads to formation of plastic islands in all the major oceans of the world. The great pacific patch that extends from Hawaii to California is the best

example of this type of pollution. Its size estimates from 10,000,000 kilometers to 15,000,000 kilometers. The ocean wise distribution of contamination is illustrated in the following picture



Plastic has been found in birds and fishes as it is consumed by them unknowingly and this factor affects the entire food chain. It is worth noting that marine life does not necessarily has to come in contact with plastic directly. Plastic toxins are absorbed by planktons and microbes in algae that are further consumed by fish. These microbes and planktons are major carbon sinks for the atmosphere. So, in a sense plastic pollution also contributes to rising temperatures and climate change. In a study conducted in California on seagulls there were on an average 37 pieces of plastic in the stomach of every bird they tested. And it is also suggested that at present we only recover 5-10% of the plastics that we produce. The impact that microplastics and Nano plastics have on marine life is far severe than originally thought. The biggest contributor to this mass of ocean plastic is China, followed by Indonesia, the Philippines and Vietnam. The U.S. only ranks 20th as a source of ocean plastic, in large part due to its advanced garbage collection system. By estimation 80% of the plastic originates from land; floating in rivers to the ocean or blew by the wind into the ocean. The remaining 20% of the plastic originates from oil platforms and ships. Rope and fishing net, Furniture foam, Floats, Polystyrene, Plastic film Straws, stirrers Cups, plates, cutlery, Plastic bags, Six-pack rings, Caps and lids, Plastic bottles, Cigarette filters are some major materials that pollute the oceans. Which means that unless the developing nations have adequate technologies related to waste collection and its sustainable dumping the chances of making the oceans clean are very slim.

Impact of plastics on atmosphere is a topic that is not discussed much because it is not evident or visible in the plastic that we use or throw away. But it should be noted that making plastic is not very efficient process. Most plastic is made by **fossil fuels like oil and natural gas,** which release toxic emissions when extracted from the earth. Oil and gas drilling releases gases like benzene, toluene, ethylbenzene, xylene, carbon monoxide, hydrogen sulphide, ozone, sulphur dioxide, particulate matter, and volatile organic compounds. It should be noted that methane is around 80 times more potent is causing greenhouse as compared to carbon dioxide. So, any increase in consumption of plastics will have a direct increase in concentration of these gases. This situation if not regulated will lead to a problem way out of control than what humans can manage with. The gases that are added to plastics to make them soft and durable are potent for people who come in direct contact with them. All of us like the smell of new car or new shower curtain or new furniture without knowing that it is the smell of gases that are used to make plastics. The health hazard of these gases ranges from obesity, lower testosterone levels, lower sperm count to lower fertility rates. Plastics for sure have greater impact than we could ever imaging. Most of the landfills that we discussed in former passage

are burnt which in turn releases all these chemicals along with newly formed compounds directly in air. They can lead to health hazards like asthma, choking and in rear incidents even death. Thus, it can be stated that almost entire constituents of environment are prone to be affected by plastic.

But it is only a problem if we depend on single use plastics as much in the future as we do now. There have been many ground-breaking discoveries that may change the impact that plastic has on our lives. For example, a team of scientists in japan have developed a "mutant enzyme" that is capable of degrading traditionally non- biodegradable plastic. This mutant enzyme is 20% more potent than its original microbe and if produced commercially can help developing nations deal with the menace of plastic in a very efficient manner. More and more applications of recycled plastics in our daily life have to be promoted. Like use of recycled plastic as a feed material for 3-d printers. Governments have to promote industries related to recycling and discourage the use and production of single use plastic. There is a company in America that converts methane in waste water of sewage system to create polymers which not only reduces pollution in two-pronged manner. What is essential is that these technologies are translated into common use and are available to the least developed and developing nations as a lucrative offer that they can-not deny. UNFCC has to give incentives and provide funds or treaties for creating favorable global environment in this regard. The fight against consumption of plastic has to be two way i.e. from top to bottom and from bottom to top. Only then we will see that societies will realistically change their dependence on plastics. Innovations and research on developing biodegradable plastics should be promoted at all levels. Most importantly mankind must acknowledge that at present we are not doing enough to curb this hazard. We must realize some basic truth's about plastic that are:

1. Plastics are omnipresent: from Everest to Antarctica, from rainforests to deserts there is not even a single element of the ecosystem that is not affected by plastics.
2. Plastics are a result of fracking: this means that they are derived from earth and has harmful effect on the environment as the technologies used are not at all environment friendly.
3. Not all plastics are recyclable and not all recyclable plastic is recycled.
4. Plastics kill and affect more than just people. They have a huge impact on the rich biodiversity of fragile ecosystems on earth.
5. Plastics lasts forever, at least most of them do.
6. It costs more to recycle a bag of plastic than to produce a new one.

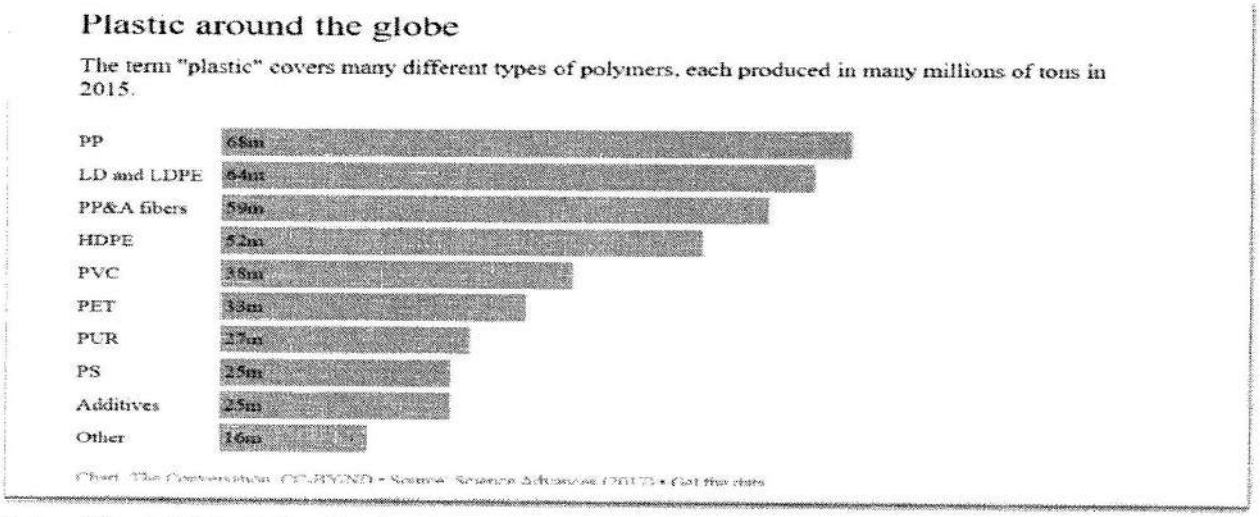
If even the awareness about these facts is disseminated among masses there will be a huge change in consumption pattern, production, collection and recycling of plastics than there is today. All this will discourage the use of single use plastics and will promote sustainable practices in this regard.This is where the role of social work profession can be vital. This profession has always responded to the needs of humanity and is most connected to communities and policymakers. Social workers have the tools and knowledge that can play a vital role in making these changes in societies viable and within reasonable changes as at present this planet cannot afford practices of maldevelopment. This picture shows the amount of plastic waste distribution across India:

To change patterns of consumption, attitudes and behaviors of people we will have to understand the information given in the following table:

Name	SPI Code	Recyclable	Symbol	Common uses
Polyethylene Terephthalate	PETE/ PET	Yes	1 PETE	Soda bottles, Water bottles, Salad dressing, bottles, Medicine jars, Peanut butter jars, Jelly Jars Combs, Bean bags, Rope, Carpet, Fiber fill material in winter clothing
High Density Polyethylene	HDPE	Yes	2 HDPE	Milk jugs, Juice containers, Grocery bags, Trash bags, Motor oil container, Shampoo and conditioner bottles, Soap bottles, Detergent containers, Bleach containers, Toys
Polyvinyl Chloride	PVC	Yes	3 PVC	Plumbing pipes, Grocery bags, Tiles, Shoes, Gutters, Window frames, Ducts, Sewage pipes

Low Density Polyethylene	LDPE	Yes	4 LDPE	Cling wrap, Sandwich bags, Squeezable bottles for condiments such as honey and mustard, Grocery bags, Frozen food bags Flexible container lids
Poly Propylene	PP	No	5 PP	Plastic diapers, Tupperware, Kitchenware Margarine tubs, Yogurt containers, Prescription bottles, Stadium cups, Bottle caps, Take-out containers, Disposable cups and plates
Polystyrene or Styrofoam	PS	No	6 PS	Disposable coffee cups, Plastic food boxes Plastic cutlery, packing foam, Packing peanuts
Miscellaneous Plastics (polycarbonate, acrylic, fiberglass, and nylon	--	No	7 OTHER	Plastic CDs and DVDs, Baby bottles, Large water bottles with multiple-gallon capacity, Medical storage containers, Eyeglasses, Exterior lighting fixtures

The global production of different types of plastic is illustrated in the following figure:



Role of Social Work Profession in abatement of plastic's impact on environment:

As per definition by International Federation of Social Workers "Social Work is a practice-based profession and an academic discipline that promotes social change and development, Social cohesion, and the empowerment and liberation of people. Principles of Social Justice, Human rights, collective responsibility and respect to diversity are central to social work. Underpinned by the theories of social work, social sciences, humanities and indigenous knowledge, social work engages people and structures to address life challenges and enhance

wellbeing". It is a profession based on worth and dignity of human beings. Idea of collective responsibility along with human rights are essential in social work practice. It aims to create reciprocal relationships between communities. Advocacy for the rights of people is an integral part of social work profession. The third generational rights of social work focus primarily on the natural world and the right to species biodiversity and intergenerational equity. Thus, it is an inherent part of this profession in helping the world dealing with the problem of plastics in future. To achieve this objective social work may employ any/ in combination of its methods that are widely practiced and are based on scientific and eclectic approach. The methods of social work are Social Case Work, Social Group Work, Community Organization, Social Work Research, Social Welfare Administration and Social Action. All the methods are practice based and can be used singularly or in combination.

The roles that the social workers can play in developing behavioral changes are manifold but they will primarily use the body of language of the profession in creating awareness among societies. This role has also been pursued by governments but their productivity in this context is not efficient. The approach that the government agencies follow is not comprehensive and precise. Generally, a common model of plan is implemented throughout the country which becomes less effective. Professional services by social workers should be utilized as they understand the structure of communities better than governments. All societies have cultural distinctions, values, norms and belief systems that are very loosely considered in case of government planning but when the same factors are embodied in the plans the effectiveness of the change escalates. The needs of the community also vary from state to state globally so an understanding of cultures and power structure becomes essential. The pursuit of development by institutions whether public or private also affects the environmental conditions. As the economy grows its manufacturing and consumption bases also grow. More and more people attain purchasing power. This creates a demand of products that are cheap, reliable and are most often produced by environmental polluting methods. Environment Impact Assessment is a tool that if used effectively can mitigate the impact of pollution. Also, the pollution testing agencies at the governmental level are following corrupt practices that often compromise the interests of local communities at large.

Social workers strive for planned change based on scientific methodology and logical interpretation of available data. This change can be at micro level, macro level or meso level. The three levels require different scale of approach and tools that need to be employed while introducing different interventions. Most of the interventions are based on facts derived through research. Social work research is a method that helps social workers in factfinding and solving problems faced by them using research methodology. In case on plastic use research can be employed in gauging the level of awareness of communities regarding ill effects of plastic. Also, the consumption pattern and alternatives can be enquired using this method. Using this method will help in making appropriate plans while designing the interventional plans. They will also help in understanding the problems that the policy makers are going to or may encounter in future while introducing change regarding plastic use. Innovations throughout the globe can be translated into simplistic ways to make plastic waste collection effective. Sometimes the change that the social workers are trying to project in the society may encounter resistance from the communities. Research will help in planning alternative ways and methods to deal with these resistances too as it will show the professionals the unknown of the problems and also the prospective opportunities on solving these problems. Using the method of social work research, we can determine the present scale of the problem and appropriately tackle it by optimum use of resources available at disposal.

It is an urgent need of the hour that proper awareness regarding the overuse of single use plastics and its long-lasting impact on environment. But this alone will not be sufficient. This has to be integrated with the other aspect that affect the lives of common people also. Unless the communities realize that there is something that has the potential to harm them, they will not cooperate in change. Methods of social advocacy and community organization may be employed so that necessary knowledge may disseminated to general public. Major corporations and government institutions could be motivated to emphasize towards using recyclable plastic more so that the spread of single use plastic is contained. Communities can be empowered to develop systems related to waste collection and proper dumping of plastic waste so that it does not become a part of our natural environment. Moreover, availability of waste collection systems has to be at all levels of governance starting from panchayats till municipalities. Entrepreneurship and innovative businesses have to be promoted to recycle plastic in the most effective way as per international norms. In those nations where such technologies are not available the profession can be used to bridge the gaps and provide alternative ways and methods of plastic collection and waste disposal. So far there is not a major industry in the world that trades in waste, so such trade between nations generating enough plastic waste and those having sufficient recyclable infrastructure could be promoted. Social work professionals can use the method of Social welfare Administration can be used to create such kind of mechanism. A large market for selling and buying recyclable and recycled plastic waste has to be created and coordinated so that even the poorest of nations can empower their GDP by trading in waste. Such innovations are a part of macro planning exercise that will reduce the carbon footprint of every nation and thus individuals at the end of the hierarchy. International bodies should promote such activities so that their functioning can be useful in decreasing the plastic burden off our planet. Best practices have to be transferred from other nations so that they could be translated as per the needs of local communities.

Again, the practical knowledge of Social case work and Social group work can be employed ay grassroot levels or micro levels so that individual's preferences can be changed relative to plastic use. The individual behavior changes and awareness of end line consumers about the recycle nature of plastic that they are going to use plays an important role in waste reduction from landfills. People must understand and segregate waste from their homes for which a mass awareness campaigns have to be pursued in developing and under developed nations where waste collection in itself is a substantial challenge. From social work practice these two methods are very important as they come in contact with individuals at primary levels so subsequently the chances of behavior modification are also more. Also, the state or government must provide and maintain necessary infrastructure and mechanism to deal with the waste right from collection stage to the recycle stage. To develop such mechanisms a mass awareness of civic society is needed so that they could advocate for their rights regarding clean environment in their surroundings. What is problematic is that societies and individuals institutionalize the problems arising out of waste dumping. They live in unhygienic conditions, are prone to illness and their overall quality of life is very low. This makes such societies vulnerable to many diseases that shorten their prospects of living a long and healthy life. Social workers first have to create awareness regarding these unhospitable conditions and make the communities realize that they are living in a problem. All the slums, gethos and congested localities around the world suffer from this problem. Once the community is made aware then the social worker has to facilitate the change process either by using community resources or by forcing the responsible authorities to act. Once this waste is taken out of the communities using proper segregation methods and once individual choices towards use of single use plastic have been changed, we will see the problem becoming small and the impact of plastic in the environment reducing. The information regarding impact of plastics can be integrated to the school curriculum of students and

communities so that their personal preferences are changed over generations. A multi-pronged approach is needed that focusses on not only on top to bottom but from bottom to top levels of society as well. All these methods will ensure that this gap in information and practice is diminished and the garbage dumps that we see surrounding our localities will start reducing. Many cities and states in the world have already banned the use of non-recyclable plastics and it will be up to the social work professionals to make sure that these practices become universal part of global community in future.

Conclusion:

Thus, it is clear that the dependency, usage, awareness and reliance of communities regarding the use of plastics is not adequate as per the sustainable requirements of the societies. This gap of information has to be bridged so that the upcoming generations don't have to live in the shadows of our misdeeds. We cannot take the critical life sustaining balance of this planet for granted. For them to enjoy a livable planet this generation and the generations to come have to take significant steps so that this destructible path that we have been following for decades could be changed. Social work profession can act as a backbone in this regard because of its close proximity and understanding of communities. It also has all the necessary tools at its disposal that can make the attainment of plastic free environment a reality. Its eclectic approach can integrate different professions and pave way towards a better future. this approach can act as a key in making our planet and environment sustainable. This can change the past wrongdoings and make way for a bright future for the upcoming generations ahead. A small step of carrying one cloth bag per person can reduce almost the need of 24 plastic bags per person per month which again means close to 288 bags per year and almost 22176 bags in a lifetime. This is the change that we have to bring in this world because if social workers don't, no one else will clean this trash from our planet for us.

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