



LEX TERRA

Center for Environmental Law, Advocacy and Research
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SPECIAL ISSUE ON THE OCCASION OF
WORLD ENVIRONMENT DAY

IN THIS ISSUE

A Critical Analysis of the Draft Notification (2021) to Amend the Coastal Regulation Zone Notification, 2019

Manju Priya S and Kavin Castro M.

The Burgeoning Horizon Of Environmental Law Through The Prism Of Sustainable Development In India: The Way Forward

Sameera Khan

Impact of Climate Change on Tea Production in Assam and Mitigation Strategies

Shambhavi Sharma

Regulating Spent Dry-Cell Batteries in India: Issues and the Way Forward

Dolly Gupta



CONTENTS

About CELAR.....	i
Message from the Chief Mentor.....	ii
Editorial.....	iii

ARTICLES

I. A Critical Analysis of the Draft Notification (2021) to Amend the Coastal Regulation Zone Notification, 2019	
Manju Priya S. and Kavin Castro M.	1
II. The Burgeoning Horizon Of Environmental Law Through The Prism Of Sustainable Development In India: The Way Forward	
Sameera Khan.....	9
III. Impact of Climate Change on Tea Production in Assam and Mitigation Strategies	
Shambhavi Sharma.....	15
IV. Regulating Spent Dry-Cell Batteries in India: Issues and the Way Forward	
Dolly Gupta.....	21



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ABOUT CELAR

The fundamental aim of the Centre for Environmental Law, Advocacy, and Research (CELAR), National Law University and Judicial Academy, Assam, is to participate in advocacy and research on public interest environmental concerns. It endeavours to do so by holding workshops and seminars to educate and improve skills, convening conferences to encourage an exchange of ideas, conducting training programmes for capacity building in environmental law issues, undertaking legal research, and publishing newsletters and journals regularly.

The main objectives of CELAR can be elucidated as follows:

- Providing students with hands-on advocacy experience and direct exposure to the issues to inspire and educate them.
- Strengthen access to justice by conducting high-quality multi-disciplinary research on current environmental legal issues.
- Advocate for reforms in environmental law through scientifically sound legislative proposals.
- Organize training programmes for civil servants, law enforcement agencies, non-governmental organisations, and media professionals to improve their legal capacity on environmental laws and policy.
- Publish environmental law publications and bulletins on a regular basis.

Thus, to meet the last objective, Lex Terra is an initiative undertaken by CELAR. Through Lex Terra, we strive to provide a voice to various aspects of the environment, published every month, to create a community of environmentally conscious individuals from the legal and non-legal fraternity. Each issue of Lex Terra features important environmental news from across the world and from within the nation. This bulletin is meticulously compiled by CELAR members dedicated enviro-legal enthusiasts.

MESSAGE FROM THE CHIEF MENTOR

It is, unfortunately, true that inadvertently, we humans are responsible for the deterioration of this planet without recognising the negative consequences of minor things we do to contribute towards its dilapidation. Education and awareness generation can be one of the positive moves to fix the irreparable damage that we have done to our Mother Nature, and in furtherance to such moves, we as a legal institution, are continuously striving to bring environment related news and views for several environmentally sentient readers.

In this context, it delights me to note that the Centre for Environmental Law, Advocacy and Research (CELAR), National Law University and Judicial Academy Assam, is releasing a new issue of its webzine, 'Lex Terra'. Lex Terra aims to be an e-forum that involves, promotes and engages students, scholars and anyone interested in environmental law, to express and share their opinions and ideas. It is our fervent expectation that this webzine will keep providing an academic forum to bring all ecologically conscious minds together to deliberate on environment related developmental decisions.

I congratulate the entire team of CELAR for bringing out this webzine which justifies one of the significant mandates of National Law University and Judicial Academy, i.e., rendering a socially relevant legal education. I appreciate the efforts made by the student editors and peer reviewers in bringing out this webzine. I also bring on record the constant guidance being provided by CELAR teacher members to the students.

I am certain that this modest endeavour of CELAR will continue to stimulate and proliferate enviro-legal awareness.

**Prof. (Dr.) V.K. Ahuja,
Vice-Chancellor, NLUJAA**

EDITORIAL

This issue of Lex Terra carries a special value. Not only is this published on the occasion of World Environment Day, but this issue also holds a sentimental value for the Editorial Board. This issue is also the last for the current Editorial Board. Our monthly endeavour to select the most thought-provoking articles from an overwhelming number of submissions has proven to be challenging, yet highly rewarding. All the authors who have contributed to this and to various issues of Lex Terra played a huge role in bringing various pertinent enviro-legal issues to the forefront.

In the first feature of this issue, Manju Priya S. highlights the changes that need to be made in the regime governing coastal zones. The author, through this article, triggers a pertinent discussion on the recent Coastal Regulation Zone draft notification that is fraught with challenges and shortcomings. Furthermore, the importance of coastal zone management is emphasised. The article also enumerates relevant case law where the importance of preserving coastal zones has been underlined. Lastly, the article has underscored the importance of saving marine and coastal areas for realising the goal of environmental conservation.

Sameera Khan, in the second article, commends the proactive approach of the legislature and judiciary vis-a-vis environment protection. By passing laws such as the NGT Act, 2010 the legislative branch of the government has created a forum where cases pertinent to environmental protection can be taken up. Likewise, the judiciary, in bringing the right to a clean environment under the purview of Fundamental Rights, has ensured that the State cannot ignore its responsibility to protect the ecology. Lastly, the author analyses several landmark cases where the judiciary has taken a prescient approach to safeguard the environment.

This special issue of Lex Terra also features a manuscript titled “Impact of Climate Change on Tea Production in Assam and Mitigation Strategies” by Shambhavi Sharma. She reiterates the importance of constructing mitigation strategies and adaptation measures as climate change disproportionately affects the livelihoods of those engaged in tea plantations in Assam. Strategies that can be implemented, according to the author, involve utilizing renewable energy sources; treatment of wastewater; reforestation; and rainwater harvesting, among others.

In the final article of this issue, Dolly Gupta discusses the issue of disposing and recycling dry-cell batteries. She comprehensively covers the dangers posed by the unsafe disposal of spent dry-cell batteries. In addition, she explores the dangers posed by these batteries to the health and environment. The lack of a substantive legislative framework and the underdeveloped infrastructure to deal with the disposal and recycling of batteries is underlined in this article. The author concludes with certain substantial suggestions which can help tackle this problem.

In our final note to all readers, the Editorial Board would like to thank all the authors who have contributed their thought-provoking pieces so far. As the fight for keeping knowledge out of the boundaries of paywalls continues, the Editorial Board also strives to ensure that Lex Terra remains freely accessible and endeavours to license it with the Creative Commons in the near future. We hope scholars, practitioners, academicians and students continue to add to the existing literature on environmental jurisprudence and utilize Lex Terra as a platform to spread awareness on environmental issues requiring immediate attention.

The publication of this issue would not have been possible without the assistance and encouragement of Lex Terra's pillar of strength and Editor-in-Chief, Dr. Chiradeep Basak, Assistant Professor of Law, NLUJAA. We would also like to express our gratitude to Prof. (Dr.) V.K. Ahuja, Vice-Chancellor of NLUJAA, for his keen interest and guidance, which made this issue of the publication possible. We also thank the esteemed Registrar of NLUJAA, Dr. Indranoshee Das, for her continuous support and for being our source of motivation throughout this endeavour. Lastly, the small but dedicated team of peer reviewers and editors deserve a special mention. This issue and all the publications in the past would not have been a reality without your sincere efforts and active engagement.

As the current Editorial Board bids farewell to Lex Terra, we are certain that the new members will carry the baton passed on to it and put in their best efforts to publish quality research articles. We would like to part with the hope that Lex Terra continues to spread the importance of the message of World Environment Day 2022's slogan "Only One Earth".

Deepika Nandagudi Srinivasa (Deputy Editor-in-Chief)
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Lex Terra Editorial Board 2021 - 2022

A CRITICAL ANALYSIS OF THE DRAFT NOTIFICATION (2021) TO AMEND THE COASTAL REGULATION ZONE NOTIFICATION, 2019

Manju Priya S.* and Kavin Castro M **

I. Introduction

The Ministry of Environment, Forest and Climate Change ('MoEF') under the powers conferred to it by the Environment Protection Act, 1986 ('EPA 1986') has published a draft notification¹ dated 01.11.2021 through which it has sought public comments on the proposed amendments in Coastal Regulation Zone ('CRZ') Notification, 2019.

While the CRZ has its own long history and evolution in the arena of environmental protection/management, the objective has almost been to protect concerned ecologically important areas by imposing restrictions on certain activities.

Section 3 of the EPA, 1986 has provided powers to the Central Government to take measures towards protecting and improving the quality of the environment under Sec. (3)(1) and to prevent control and abate environmental pollution. The powers are to ensure effective implementation of the provisions of the Act under Sec. (3)(2)(xiv)².

That much said about the noble intention of the law, in practice, the MoEF has gradually diluted the law drastically including this present draft. This is at the behest of what they claim as representations from different 'stakeholders', upon such considerations and along with similar recommendations on related issues being made by National Coastal Zone Management Authority ('NCZMA') on 23.03.2021 vide its 42nd meeting, the final result is these proposed amendments.

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¹ S.O. 4547(E) Date [01-11-2021] Seeking Public Comments on proposed amendments in Coastal Regulation Zone (CRZ) Notification, 2019, (Mar 15, 2022), <https://MoEF.gov.in/en/s-o-4547e-date-01-11-2021-seeking-public-comments-on-proposed-amendments-in-coastal-regulation-zone-crz-notification-2019/>.

² Environment Protection Act, 1986, No. 29, Acts of Parliament, 1986 (India).

1.1 The Proposed Amendments to CRZ Notification 2019

While paragraph 5.1.2 deals with CRZ-1 B and paragraph 5.4 deals with CRZ-IV, where under both those zones, such activities which are regulated or permissible are been mentioned respectively. Sub-clause (xiii) in 5.1.2 and sub-clause (x) in 5.4 had earlier provided for “*Exploration and extraction of oil and natural gas and all associated activities and facilities thereto*”. Through the draft, it has been proposed to substitute the above clauses with “*Development and production of oil and natural gas and all associated facilities thereto; Exploratory drilling operations shall be exempted from prior CRZ clearance*”.

Further, a new clause (xix) has been proposed to be inserted in paragraph 5.1.2 which provides that shacks which are temporary seasonal structures can be customarily put up and is also allowed to be retained with adequate precautions during the monsoon season. Further with respect to Goa and Maharashtra, such structures put up between September to May can be allowed to be retained during June to August on a condition that the facilities should be non-operational in them at the latter period.

While paragraph 7, sub-clause (i) stipulates for prior CRZ clearance before the commencement for projects for those permitted and regulated activities, the draft proposes to substitute the same by adding an exception of prior clearance for those special dispensations mentioned in the notification. Further sub-clause (ii) of the same para vests with the MoEF for CRZ clearance pertaining to CRZ-I and CRZ-IV areas, the draft proposes certain exceptions such as “*stand-alone jetties, breakwaters, groynes, salt works, slipways and manual erosion control bunds*” to be dealt with by the State Coastal Zone Management Authority (‘SCZMA’) or State Environment Impact Assessment Authority (‘SEIAA’). Further, the draft provides that, the MoEF will deal with CRZ clearance for those activities pertaining to projects of the Department of Atomic Energy or relating to Defence.

The draft also proposes to insert sub-clause (e) under clause (ii) of paragraph 8 dealing with the procedure for CRZ clearance, wherein for those activities exempted under sub-clause (ii) of Para 7, the clearance be considered within sixty days of receipt of the proposal. It also proposes changes to the agencies which can draw up a CRZ map for clearance, then substitutes a clause pertaining to Integrated Island Management Plans. The draft proposes a new clause under Para 10 providing the traditional coastal communities for removal of sand

bars in CRZ areas only by manual method, and the same be regulated by the State Government subject to conditions.

II. Judiciary on CRZ and Ex Post Facto Environmental Clearance

In *Indian Council for Enviro-Legal Action v. Union of India*³ decided on April, 18, 1996 the Supreme Court dealt with PIL aggrieved by the non-implementation of CRZ notification on part of the Government leading to environmental degradation in coastal areas. The Court called for a balanced approach between environmental protection and economic development, as well as other social and cultural interests. The Court stated that, “enactment of law but tolerating its infringement, is worse than not enacting a law at all”. The Court underlined the importance of effective implementation of laws to fulfil the purpose of that enactment by the legislature. The Court remarked that, “*with rapid industrialisation taking place, there is an increasing threat to the maintenance of the ecological balance*”.

In *S Jagannath v. Union of India*⁴ decided on December, 11, 1996, the Supreme Court dealt with a PIL seeking enforcement of the CRZ laws against the shrimp/ prawn culture industry in sensitive coastal areas which are commercial as against the traditional method. Court took note of the increasing coastal and marine pollution leading to degradation of marine ecosystem. The Court also mentioned from a report about the right of passage of coastal fishermen being curtailed by these shrimp industry, issues of drinking water problems, impact on mangrove forests, biodiversity loss etc. The Court looked into the statement of objects and reasons of the EPA, 1986 which was enacted after the Stockholm Conference. The Court while allowed the industry, it prescribed for environmental impact assessment to grant permission for the same. The Court also directed to constitute an authority under the EPA, 1986 which shall be provided with all powers in furtherance of protecting the coastal areas. It is this judgement which led to the establishment of Coastal Zone Management Authority, which shall implement precautionary principle and polluter pays principle.

In *Piedade Filomena Gonsalves v. State of Goa*⁵ decided on March, 11, 2004 the Supreme Court dealt with the unauthorised construction of concrete building by replacing a thatched roof structure within 200 metres from the High Tide Line in the CRZ without permission in

³ *Indian Council for Enviro-Legal Action v. Union of India*, (1996) 5 SCC 281.

⁴ *S. Jagannath v. Union of India*, (1997) 2 SCC 87.

⁵ *Piedade Filomena Gonsalves v. State of Goa*, (2004) 3 SCC 445.

violation of CRZ notification, 1991. The appellant herein was aggrieved by the High Court judgement which directed for demolition of the said construction and thus approached the Supreme Court seeking relief. While his appeal was dismissed by the Court, it also observed the importance of the CRZ as such “protecting environment and ecology in the coastal area”. In *Common Cause v. Union of India & Ors*⁶ the Supreme Court dealt with illegalities in mining lease and grant of environmental clearance relating to the same. The Court has time and again held the idea of retrospective application of environmental clearance or ex post facto clearance as illegal, as it poses harm to environment.

In *Kerala State Coastal Zone Management Authority v. State of Kerala Maradu Municipality*⁷ decided on May, 08, 2019 the Supreme Court dealt with the Marudu Flats built on the shores of backwaters in Kerala. In this case, the local body had granted building permits without any consultation with the CZMA without having complied with the CRZ laws. It discussed about the potential environmental consequences of such construction in the vulnerable coastal area. The Court held that in the area coming under the CRZ that it held as illegal, the permission provided by the Panchayat for such construction at a place there should have been no development activity. The Court directed for removal of those structures. The Court also subsequently pulled up the State for non-compliance and finally in the next few months they are demolished.

In *Alembic Pharmaceuticals Ltd. v. Rohit Prajapati & Ors*⁸ decided on April 01, 2020 the Supreme Court dealt with a circular providing for ex post facto environmental clearance. This case arose out of an appeal against an order of the NGT which held the circular as contrary to law, as well as directed to revoke such clearances issued at the behest of the circular and also imposed to pay compensation for causing environmental degradation. While clearance was required as per Environmental Impact Assessment (‘EIA’) Notification 1994, the circular provided such industrial activities which had not obtained prior environmental clearance to be granted with ex post facto clearance until 2003 by paying some amount into a fund.

The Court has observed that ex post facto clearance goes against the established environmental jurisprudence of precautionary principle and sustainable development. The

⁶ *Common Cause v. Union of India & Ors* (Writ Petition (Civil) No. 114 of 2014).

⁷ *Kerala State Coastal Zone Management Authority v. State of Kerala*, (2019) 7 SCC 248.

⁸ *Alembic Pharmaceuticals Ltd. v. Rohit Prajapati*, (2020) 17 SCC 157.

Court while even have noted that certain industries have run without prior clearance but subsequently had obtained them, during the period where they were unregulated it is undeniable that they would have caused irreparable loss and degradation to environment.

However, the Court after discussing various precedents in this regard, was of the view to apply the doctrine of proportionality to ascertain this case by taking a balanced approach. While holding that the directions of closure and revocation of clearance by NGT as not proportional, the Court directed each of the industry to deposit Rupees 10 crores as compensation which should be used for restoration and other measures to improve the quality of environment in those areas where the industries are located. While the Court has stated that this order is in accordance with precautionary principle, it needs to be answered whether it is merely another application of polluter pays principle.

III. Legalising Illegality by MoEF

The MOEF on 19th February, 2021 issued an office memorandum⁹ under the CRZ notification 2011 providing for CRZ clearance for those activities permissible under the notification but have started construction or work without obtaining prior CRZ clearance. Therefore, it claimed that rather than leaving it ungoverned, they need to comply with the existing laws. The memorandum provides for a procedure to deal with such violations for granting them prospective clearance after assessment of the damages caused followed by a compensatory conservation plan wherever necessary and other specific recommendations of CZMA after and thereafter ascertain whether it is in consonance as per existing CZMP and 2011 notification. After which it needs to be taken up to the PARIVESH portal and follow appropriate steps. This memorandum can be nonetheless seen as a measure diluting the core objectives of CRZ laws and environmental jurisprudence. This can be regarded as yet another example of ‘fence eating the crops’ where MoEF has been repeatedly diluting the laws and paving way for environmental degradation.

Through an interim order, the Bombay High Court in the PIL which has challenged the office memorandum has observed that it is of nature that dilutes the objectives of EPA and related

⁹ Procedure for dealing with violations arising due to not obtaining a prior CRZ clearance for permissible activities, (Mar 15, 2022)

<https://MoEF.gov.in/en/procedure-for-dealing-with-violations-arising-due-to-not-obtaining-a-prior-crz-clearance-for-permissible-activities/>.

laws. The Court held that “we restrain the respondents from granting any permission/clearance on the basis of the office memorandum under challenge till August 31, 2021, or until further orders, whichever is earlier”.¹⁰

It is also to note that, while the CRZ Notification, 2019 is yet to come into effect until the approval of the updated CZMP which is to be submitted to the MoEF by the States, the Supreme Court very recently has issued a notice in a case where the 2019 notification has been challenged.¹¹

IV. Impact on Coastal/ Marine Ecosystem, Fishing and Local Communities and Public Participation

The onshore hydrocarbon and oil exploration activities especially drilling and hydraulic fracturing for ascertaining the presence of natural gas in the Kaveri delta region of Tamil Nadu have irked strong protests by farmers, environmentalists and local people due to its impacts such as fire accidents, adverse effects on agriculture and quality of soil and groundwater and hence the livelihood of the people¹². Being so, the offshore explorations may prove to be more disastrous given the utter lack of mechanism and effective monitoring of violations. While already the corporations involved in these are seeking exemption from the public hearing, the draft proposal furthers their agenda.¹³

Given the number of accidents across the globe in such explorations, there are all possibilities in which oil spills may lead to a catastrophic impact on the fishes and marine biodiversity,¹⁴ thereby affecting the food security and livelihood of fishing communities and others dependent on the same.¹⁵ Further, the innumerable exploratory wells which may be

¹⁰ Sharmeen Hakim, *'Prima Facie Dilutes Environment Act': Bombay High Court Retrains MoEF from Granting Post-facto CRZ Clearance*, (2021), LIVE LAW (Mar 15, 2022), <https://www.livelaw.in/news-updates/bombay-high-court-retrains-moef-from-granting-post-facto-crz-clearance-173933>

¹¹ Sohini Chowdhury, *Supreme Court Issues Notice on Plea Challenging Coastal Regulation Zone Notification, 2019*, LIVE LAW (Mar 15, 2022), <https://www.livelaw.in/top-stories/supreme-court-coastal-regulation-zone-crz-notification-2019-bombay-hc-192467>.

¹² Nityanand Jayaraman, *All You Need to Know About the Neduvasal Protests Against Hydrocarbon Extraction*, THE WIRE (Mar 15, 2022), <https://thewire.in/environment/neduvasal-protest-oil-gas>.

¹³ Anna Isaac, *Explained: Vedanta gets preliminary nod to drill hydrocarbon wells in TN's rice bowl*, THE NEWS MINUTE (Mar 15, 2022), <https://www.thenewsminute.com/article/explained-vedanta-gets-preliminary-nod-drill-hydrocarbon-wells-tn-s-rice-bowl-101712>.

¹⁴ *Environmentally, India's Hydrocarbon Sector Enjoys a Regulatory Free-for-all*, THE WIRE (Mar 15, 2022), <https://thewire.in/environment/environmentally-indias-hydrocarbon-sector-enjoys-a-regulatory-free-for-all>.

¹⁵ Nathan Andrews et al., *Oil, fisheries and coastal communities: A review of impacts on the environment, livelihoods, space and governance*, 75 ENERGY RESEARCH & SOCIAL SCIENCE 102009 (2021).

conducted therein will obstruct the passage of fishing boats and coastal communities at the hands of corporations that have a history of environmental violations across the globe.¹⁶

Further, while the 2004 Tsunami had struck the entire coastal region of Tamil Nadu, is one of the worst disasters from which some areas are yet to recover, and considering the recent cyclones and possibilities of earthquakes, it is never wise to allow these activities.

While public consultation is a mandatory step in the process for obtaining environmental clearance as per EIA Notification (even though the latest EIA notification has exempted onshore and offshore oil and gas exploration from prior clearance), this allows for those in that locality to participate in the public hearing at the place of the proposed site or nearby and provides for seeking responses from those concerned persons having a stake in the proposed activity. These emphasise the importance of democratic participation of the people and especially local communities.

Further, prior clearance being exempted by this draft proposal, deprives the right of people to participate and express their contentions over something which might largely affect their livelihood and interest of local communities. This dilution is a clear violation of rule of law, principles of natural justice and basic democratic principles.

It can also be said that this draft proposal being a delegated legislation can be challenged on the ground that it is ultra vires the parent Act (EPA 1986) since it is inconsistent with the objectives of the parent Act. While the EPA, 1986 vests power under Section 3 on the central government to take measures towards protecting environment and improving the quality of the same, the draft proposal is contrary to it.

V. Conclusion

It is pertinent to note that the previous year United Nations Development Programme released a video as a part of its campaign against climate change where the fictional Dino

¹⁶ Erik E. Cordes et al., *Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies*, FRONTIERS IN ENVIRONMENTAL SCIENCE (Mar 15, 2022), <https://www.frontiersin.org/article/10.3389/fenvs.2016.00058>.

cautions humanity about extinction due to climate disaster.¹⁷ The World Meteorological Organization's provisional report titled *State of Global Climate 2021*, had stated that the last seven years from 2015 to 2021 were the seven warmest years on record globally.¹⁸ It is known about the role of the Oceans in containing global warming by absorbing greenhouse gases. In this context, the report mentions the rapid increase in sea-surface temperatures and that of ocean water resulting in an increase in mean sea level. The increased Carbon Dioxide content absorbed by the Oceans has also led to acidification and hence, has an adverse impact on marine and coastal ecosystems.

Given the mutual relationship between climate change and marine/coastal ecosystems, the law regulating the same needs to be and is more relevant than ever towards the realisation of the lofty goals of sustainable development and to prevent further increase in the global warming temperature above 1.5°C. When exploitation and degradation of the environment have become a norm and as a result, climate change has proved to have a devastating impact on our planet and humanity, as well as the livelihood of the dependent communities, this proposal of scrapping away the prior clearance must be reconsidered and one must move towards more sustainable sources of energy.

¹⁷ UNITED NATIONS, *Don't Choose Extinction - UNDP / United Nations / Jack Black / Climate Action*, (2021), YOUTUBE (Jan 28, 2022), <https://www.youtube.com/watch?v=3DOcQR19ASc>.

¹⁸ WORLD METEOROLOGICAL ORGANIZATION (WMO), *STATE OF THE GLOBAL CLIMATE 2021: WMO PROVISIONAL REPORT* (2021).

The BURGEONING HORIZON OF ENVIRONMENTAL LAW THROUGH THE PRISM OF SUSTAINABLE DEVELOPMENT IN INDIA: THE WAY FORWARD

Sameera Khan*

I. Introduction

“The world has enough for everyone's needs, but not everyone's greed”.

- Mahatma Gandhi

The term sustainable development was first mentioned in the “*Stockholm Declaration of 1972*”. It has been defined by the World Commission on Environment and Development as “*development that meets the needs of the present without compromising the ability of the future generations to meet their own needs*”.

It was codified in the Rio Declaration on Environment and Development, 1992. The principle of sustainable development is based on the concept of maintenance of a balance between development and preserving the environment. The primary motive is to enhance “*inter-generational equality*”. It is aimed at preservation of the environment, natural resources and good living conditions for the future generations. There were 17 Sustainable Development Goals (SDG) laid down in Rio in the year 2012. They were aimed at countering the pressing environmental, economic and political challenges being faced by the world. They encourage nations to work together for the promotion of sustainable development. India is one of the key participants in the fulfilment of SDGs.

The Indian Supreme Court in the case of *Narmada Bachao Andolan v. Union of India*¹ observed that, “*Sustainable Development means what type or extent of development can take place, which can be sustained by nature or ecology with or without mitigation*”. The Indian jurisprudence on this subject has largely been developed in light of Article 21 of the Constitution of India. The Supreme Court has utilized the power bestowed upon it by the virtue of Article 142 of the Constitution of India.

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¹Narmada Bachao Andolan v. Union of India, (2000) 10 SCC 664.

The principles on which sustainable development has been based were mentioned by the Supreme Court in the case of *Vellore Citizens Welfare Forum v. Union of India (Tamil Nadu Tanneries Case)*². They were culled out from the Bruntland Report and other relevant international documents. They included, “*Inter-Generational Equity, Use and Conservation of Nature Resources, Environmental Protection, the Precautionary Principle, Polluter Pays Principle, Obligation to assist and cooperate, Eradication of Poverty and Financial Assistance to the Developing Countries*”. It further stated that “*The Precautionary Principle*” and “*The Polluter Pays*” principle are essential features of “*Sustainable Development*”.

II. The Development of Environmental Law in India

The Supreme Court started using its power under Article 142 to take cognizance of cases involving the environment. It brought the cases related to environment under the ambit of Article 21 of the Indian Constitution. The Environment (Protection) Act, 1986 was also enacted to empower the Government to take remedial action in case where environment is being damaged. The Supreme Court of India had observed the need for setting up of specialised environment Courts in order to steadily dispose of the cases related to the environment. This was achieved to an extent by the establishment of the National Green Tribunal (NGT) via the National Green Tribunal Act, 2010. The tribunal were established for expeditious and effective disposal of cases which involved multi-disciplinary issues related to the environment. *Section 19* of the National Green Tribunal Act, 2010 empowers the NGT to hear civil matters involving environmental issues. It is bound by the principles of natural justice under *Section 19(1)* of the Act. *Section 20* of the Act provides that the principles of Sustainable Development, namely Polluter Pays and Precautionary Principle must be applied by the NGT while making a decision.

The NGT has played a key role in sustainable development in India. It has adopted a balanced approach and has passed judgments in favour of industrial projects when the economic development is greater than the environmental cost. Such projects must have a plan where they provide an Environment Management Plan which must be scientifically backed. In the case of *Sterlite Industries (India) Pvt. Ltd. v. Tamil Nadu Pollution Control Board and*

²Vellore Citizens Welfare Forum v. Union of India, AIR 1996 SC 2715.

Ors.,³ the NGT issued certain directions and held that, “*The environmental restrictions must operate with all their rigour but no action should be suspicion-based which itself is not well-founded. Precautionary principle should be invoked when the reasonable scientific data suggests that without taking appropriate preventive measures there is a plausible indication of some environmental injury or health hazard*”.

III. Role of the Supreme Court

The expression “life” under Article 21 was given an extended meaning by the Supreme Court. The Court interpreted it to include protection against health hazards which are caused due to pollution and those which occur from the use of harmful drugs.⁴ In the case of *Vincent Panikuriangara v. Union of India*⁵ the Hon’ble SC had observed that, “*A healthy body is the very foundation for all human activities and in a welfare state it is the obligation of the state to ensure the creation and the sustaining of conditions congenial to good health*”. This has put obligation upon the state to provide the citizens with environmental conditions that are conducive to living and protect their health.

It is well-known that vehicular pollution is a major issue in New Delhi. This issue was first addressed by the Supreme Court in the year 1991 in the case of *M.C. Mehta v. Union of India*.⁶ The pollution due to vehicles was on the rise and the Court held that the government had responsibility to see that there was no contamination of air due to the pollution caused by vehicles. The stance that the Right to a Healthy Environment comes under the Right to Life under Article 21 was reiterated by the Court. The introduction of lead-free petrol in Delhi was done after this case. Moreover, following the directions of Court, commercial vehicles which were older than five years were phased out completely.

³*Sterlite Industries (India) Pvt. Ltd. v. Tamil Nadu Pollution Control Board and Ors*, Appeal No. 57 and 58 of 2013, NGT.

⁴*Dr. Ashok v. Union of India*, (1997) 5 SCC 10.

⁵*Vincent Panikuriangara v. Union of India*, (1987) 2 SCC 165.

⁶*M.C. Mehta v. Union of India*, 1991 SCR (1) 866.

In the case of *M.C. Mehta v. Union of India*,⁷ there was a conflict between the economic interests of corporations and the right of the people to a clean and safe environment. Several industries had been established in Kanpur along the banks of the river Ganga. They had been discharging untreated waste into the river which was damaging to the river as well as a danger to the health of the people. The Court ordered that every industry had to establish a primary and secondary treatment plant irrespective of the cost of such plant, since the right to a clean and healthy environment took priority over all other rights. The economic implications related to revenue, employment generation, cost benefits and more were set aside in the light of environmental pollution. This stance had been reiterated again in the case of *Bayer India Ltd. v. State of Maharashtra*,⁸ where the Court held that, “*nothing can be more fundamental than the issue of public safety and right to life*”. Therefore, in any case where this right has been infringed, the action that needs to be taken is to be based upon the welfare of citizens and not any other entity.

If the factory is in a populated neighbourhood, it is the duty of the owner of the factory to ensure that all the necessary precautions are taken not only for the health and safety of the workers but also ensure that the population in the surrounding areas does not suffer any adverse side effects. The Supreme Court has played a pivotal role in the protection of environment and the promotion of sustainable development.

IV. Policy Initiatives in India

The Indian Government has undertaken a number of policies with a view to achieve the “*Sustainable Development Goals*”. These policies include the Namami Gange Programme which is aimed at the reduction of pollution in the river Ganga and helping in its rejuvenation. It tackles industrial pollution, emphasises on rural sanitation, conservation of ecosystem and efficient use of water. The rising level of air pollution across different cities in India has been a matter of grave concern. Subsequently, the National Clean Air Programme was launched by the Indian Government at the national level to control the level of air pollution in the country. The National Policy of Resource Efficiency has been built upon

⁷ *M.C. Mehta v. Union of India*, (2004) 12 SCC 118.

⁸ *Bayer India Ltd. v. State of Maharashtra*, (1995) 97 Bom LR 957.

existing policies to maintain efficiency of resources to achieve SDGs.⁹ This can be a major method to meet the requisite needs of the country for resources while mitigating the environmental costs. The *Companies Act, 2013* and the *Companies Corporate Social Responsibilities Policy Rules (2014)* mandate the companies to constitute a CSR Committee and spend a minimum of 2% of its net profits on CSR initiatives.

Moreover, the Government has also started a Product Linked Incentive Scheme (PLI) for the development of solar products. It is aimed at incentivising the development of photovoltaic cells to cut dependence on foreign imports from China and achieve the renewable energy targets for 2030.¹⁰ The FAME Scheme has been launched by the Government in 2019 with an aim to increase the demand for EVs in the country at private and commercial level. It is aimed at making environment friendly EVs as an affordable form of transportation.¹¹ Such policy initiatives will encourage sustainable development in India and are also aimed at fulfilling the right to health of people which has been brought under the ambit of Article 21 of the Constitution by the Supreme Court.

V. Conclusion

India is a country which is still primarily dependent upon an agrarian economy. Moreover, the vast coastline and varied geographical landscapes mean that there is an abundance of natural resources to be exploited. This also makes it vulnerable to the adverse effects of climate change. However, India is still a developing nation and cannot limit its development on the basis of natural resources excessively unlike the developed countries. Therefore, a fine balance has to be maintained between developmental activities and environmental conservation. The Indian Government has taken a number of measures over the years to promote sustainable development. The Courts have played a key role in Environmental

⁹ Press Bureau of India, *India follows a holistic approach towards its 2030 Sustainable Development Goals (SDGs)*, PRESS INFORMATION BUREAU, GOVERNMENT OF INDIA, MINISTRY OF FINANCE (Mar 15, 2022, 10:04 AM), <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1577014>.

¹⁰ Tanya Krishna, *PLI Scheme for Solar to Help Reliance, Tata, Adani, 16 Others Take India Closer To 2030 Renewable Energy Goal*, FINANCIAL EXPRESS (Mar 15, 2022, 9:44 PM), <https://www.financialexpress.com/industry/pli-scheme-for-solar-to-help-reliance-tata-adani-16-others-to-take-india-closer-to-2030-renewable-goal/2425262/>.

¹¹ National Automotive Board, *About FAME II*, GOVERNMENT OF INDIA, MINISTRY OF HEAVY INDUSTRIES (Mar 15, 2022, 10:44 PM), <http://fame2.heavyindustry.gov.in/>.

Protection which has led to the development of “*Environmental Jurisprudence*”. The judiciary has recognized the importance of sustainable development and has provided detailed explanation with regards to the principles that need to be followed. The establishment of the National Green Tribunal has given a major boost to sustainable development in India as it gives decisions based on the principles of natural justice keeping sustainable development in mind. The number of programs introduced by the Government also bode well for sustainable development in India in the future. The framework and the requisite steps which are needed for sustainable development have already been set in motion. The Indian Courts as well as the Indian Government have shown willingness to work towards the goals of sustainable development. Therefore, it is essential that these steps are carried out in an effective manner and new innovations in technology are applied effectively in order to promote sustainable development. The Courts need to ensure that they evolve with the technological development and are able to keep a check on the maintenance of a balance between development and environmental protection.

IMPACT OF CLIMATE CHANGE ON TEA PRODUCTION IN ASSAM AND MITIGATION STRATEGIES

Shambhavi Sharma*

I. The Tea Industry of Assam and its Importance- A Social and Economic Perspective

Due to its aroma and affordability, tea is one of the most widely consumed beverages globally. It was only in the year 1837 when the first tea garden was established in the Assamese town of Chabua¹ as trading with China for tea in exchange of gold coins was proving to be very expensive for the British colonizers. The tea industry expanded at a tremendous pace in Assam and the state became the largest tea producing state in the country producing about 6,14,570 tons of tea per year. Assam alone produced 652.95 million kg of tea in 2015 and contributed about 52 per cent of total tea production in India.²

Not only is Assam the largest tea producing state in the country, but it is also home to the indigenous variety of tea “*Camellia Sinensis Assaica*”. Assamese tea is often used in various blends and consumed the world over. Tea is one of the most labour-intensive industries in the present times. The Assam tea industry provides employment to more than a million people. The Assamese tea industry not only provides employment to the people residing in Assam, but also to the people belonging to the adjoining states playing a significant role in the lives of the people of the region.

II. Climate Change and the Tea Industry

Regular tea drinkers can often distinguish between the various varieties of tea leaves on the basis of their growth conditions. This shows the influence that climatic conditions have on the final yield produced by tea plants. In a 2018 survey of tea-farm workers in Assam, 88% of managers of plantations and 97% of smallholders said that adverse climate conditions were a definite threat to their tea-growing operations.³

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¹ Mridusmita Duara & S. Mallick, *Tea Industry in Assam (India): Issues of Migration and Gender Discrimination*, Proceedings of International Conference on History and Society Development (ICHSD2012), 174,177 (2012).

² Annesha Mech, *Status of Tea Production in Assam: Past Trends and its Future Projections*, JOUR, Apr. 2018.

³ Eloise M. Biggs et al. *Tea production characteristics of tea growers (plantations and smallholdings) and livelihood dimensions of tea workers in Assam, India*. (2018).

Change in rainfall patterns in the region coupled with ever-increasing temperatures have adversely affected not only the quantity of tea leaves produced, but also the quality of the leaves produced.

2.1 Factors Influencing Tea Production in Assam

Around the globe, temperatures are rising, precipitation patterns are changing and extreme climatic events are on a rise and Assam is no exception to the same. It is generally accepted by the scientific community that tea originated as an understory plant in tropical rainforests which makes it likely for tea's photosynthetic capacity to function at its best under shade. Though a moderate temperature increase might not adversely impact tea production, a temperature increase beyond a certain point severely harms it.

Tea grows well within a range of about 18-25 degrees Celsius. Air temperatures below 13 degrees Celsius and above 30 degrees Celsius have been found to reduce shoot growth.⁴ However, temperature ranges in Assam have undergone tremendous shifts. Diurnal temperature ranges are noted to have significantly decreased in the South Bank and Upper Assam, yet increased in Cachar and the North Bank.⁵

Tea is a rainwater plant which means that tea production is solely dependent upon rainfall as opposed to other crops that require water through irrigation as well. This high dependency of tea plants on precipitation makes them very vulnerable to even the slightest variations in rainfall patterns. Certain researchers have observed that the annual rainy days are decreasing in Assam. Intraregional variation also exists for contrasting trends in annual monsoonal and winter precipitation with the monsoon onset date also temporally shifting earlier.⁶

2.2 Impact of Climate Change on Tea Production in Assam

The impact of climate change can be felt most severely in regions and industries where the human dependence on the environment is high and changes in climatic conditions have a direct impact on the economic and social lives of the people. The dependency of tea on

⁴ Mohammedsani Zakir, *Review on Impacts of Climate Change on Tea Yield, Yield Components and Quality*, Volume 4, Issue 5, IJRSAS, 24, 37 (2018).

⁵ *supra* note 3.

⁶ *Id.*

factors such as temperature and precipitation thus make tea production highly susceptible to climate change.

The rate of shoot growth determines the weight of tea shoots plucked in a given cycle and the land cultivated determines the number of tea shoots plucked. Various environmental conditions determine the rate of shoot expansion and this influences the yield produced. Increase in temperature causes the soil to dry. It also makes the tea plants more susceptible to pest infestation affecting the quality of tea produced. Prolonged exposure to sunlight not only damages the yield but also proves to be precarious for the health of the plantation workers. Excessive use of pesticides poses a health risk to its consumers.

An increase in extreme climatic events in the recent past have made the production of good quality tea leaves difficult. It is needless to say that rainfall patterns have a huge impact on the quality and quantity of tea leaves produced. Recent studies suggest that increased water availability rises tea plant growth and the growth of new leaves on tea bushes. An increase in the retreat date of the monsoon, and an increase in monsoon precipitation is associated with a decrease in tea yield.⁷ Not only does rainfall influence the quantity of tea produced, but it also affects its antioxidant content. It has been found that more rainfall increased the antioxidant level overall, even though levels of certain antioxidants decreased.⁸

A decrease in the quality and quantity of tea leaves produced would have disastrous effects on the economy of not only Assam, but on the economy of the entire country.

The tea industry employs more than a million people. The livelihoods of approximately 1.2 million labourers in Assam is being supported by this industry.⁹ Climate change not only affects the production of tea leaves and their quality but also has a huge impact on the lives of the people involved in tea production. While plantation owners have to invest more financial resources to buy fertilizers and pesticides that were not needed before, plantation workers are at a risk of being deprived of their only source of income. Plantation workers are rarely remunerated appropriately for their hard work. An increased burden on tea production and

⁷ Eloise M. Biggs et al. *Observing climate impacts on tea yield in Assam, India*. (2016).

⁸ Amanda Kowalsick et al. *Metabolite profiling of Camellia sinensis by automated sequential, multidimensional gas chromatography/mass spectrometry reveals strong monsoon effects on tea constituents*, J CHROMATOGR A. 230, 239 (2014).

⁹ *supra* note 7.

lower revenue generated from plantations as a result of climate change might lead the plantation owners to not even pay minimum wages to their employees.

III. Adaptation and Mitigation Strategies to Combat Climate Change in the Tea Industry

3.1 Adaptation and Mitigation Strategies: The Difference

If attempted to be defined in simple terms, mitigation measures are those actions that are taken to reduce and curb greenhouse gas emissions, while adaptation measures are based on reducing vulnerability to the effects of climate change.¹⁰

3.2 Strategies that can be Implemented by the Tea Industry

Fossil fuels and nonrenewable gases are still being used for the purpose of tea transportation. Tea factories are dependent on nonrenewable gases to carry out almost all functions. Switching to renewable sources of energy will help reduce these emissions. In addition to that, tea factories can indulge in other sustainable practices such as installing equipment like energy-saving stoves and using wood obtained from sustainable forests only. Plantation owners can also engage in the development of large-scale tree nurseries and harvest wood required by them in a sustainable manner. In addition, wastewater from tea factories must be treated before being channeled back to river systems.

In Assam, garden managers are responding to the threat of climate change by engaging in practices like mulching, reforestation and rainwater harvesting. Rainwater harvesting helps enable irrigation during dry spells. Mulching helps to conserve soil moisture and soil quality, and also reduces soil run off. It also lowers the soil temperature. The continuation of such practices and the implementation of similar practices in future would enable a sustainable culture in tea production.

3.3 Impact of Implementation of Mitigation and Adaptation Strategies on Tea Production

In addition to the obvious environmental benefits, mitigation and adaptation strategies also possess an array of co-benefits. For instance, by installing an on-site alternative to electricity like a hydropower source, factory and plantation owners would ensure that they have energy

¹⁰ Selena Ahmed et al. Effects of water availability and pest pressures on tea (*Camellia sinensis*) growth and functional quality. AOB PLANTS. (2013).

security at all times. It would also ensure that in case of future increase in energy prices, they do not have to invest more financial resources towards purchasing electricity.

In the present time, a substantial amount of revenue generated by tea farms and factories is used for purchasing electricity, fossil fuels etc. A switch to renewable sources of energy or even small changes in energy consumption patterns would ensure a reduction in operational costs. Using the appropriate quality and quantity of fertilizers would also facilitate cost reductions.

By helping local farmers produce sustainable wood and by engaging in sustainable forestry practices themselves, plantation and factory owners would not only cater to their need of wood consumption, but help the community at large.

4. Sustainable Development Goals to Mitigate the Impact of Climate Change in the Tea Industry

SDG goal 13 formulated by the United Nations aims to combat climate change and its impact. The application of sustainable development principles to the tea industry of Assam would ensure that the adverse impacts of climate change would be combatted with long term impacts.

Principles of sustainability were stressed upon in a report produced by a panel appointed by the government of British Columbia in the year 2002 which was tasked with providing advice on climate change policy. The panel emphasized that Climate change policy should be framed in the context of sustainable development and all government decisions should be screened using a “sustainability lens”.¹¹

New forms of partnerships must be created between the private and public sectors to chalk out innovative and effective business models which implement the sustainable development goals. Use of technology and creating awareness amongst the masses regarding various sustainability practices would also facilitate the implementation of SDG goal 13.

¹¹ Jorge Soberón et al. *Implications of the hierarchical structure of biodiversity for the development of ecological indicators of sustainable use*. AMBIO: A JOURNAL OF THE HUMAN ENVIRONMENT, 29(3), 136-142 (2000).

V. Conclusion:

Climate change is a global issue affecting every industry and every region. The high dependency of tea production on environmental factors like rainfall pattern makes the industry even more vulnerable to climate change. Though it is true that climate change is a grave issue it is not something that cannot be combatted. An effective implementation of well-planned mitigation strategies and sustainable development goals would ensure that the issue of climate change in the tea industry is addressed and successfully combatted.

REGULATING SPENT DRY-CELL BATTERIES IN INDIA: ISSUES AND THE WAY FORWARD

Dolly Gupta*

I. Introduction

Owing to the wide population and growing dependence on technology-driven goods, the battery market in India has become enormous. Constant efforts and innovations to generate and store power are made to meet the ever-increasing power demand of the growing population. While the automotive sector in India is the largest consumer of lead acid batteries, the development of science and technology in other fields has also resulted in increased consumption of other battery types. There has been a major emphasis on renewable energy in the recent times, leading to an increase in demand for batteries. Unlike the batteries used in mobiles or automobiles that have longer life spans, the smaller batteries such as those used in flashlights or remotes enter the waste stream quicker owing to its relatively shorter usage life.¹

The casual dumping of the end-of life batteries containing hazardous and toxic chemicals can be detrimental to the environment and human health. It can percolate into soil and water, contaminate food and water supplies and thus make it unsuitable for human consumption, use by mankind and animals. For instance, the careless disposal of nickel cadmium batteries can have harmful effects. The metallic cylinder corrodes in the landfills and eventually enters the soil, water supply and the food system. It is almost impossible to remove cadmium contaminants from the land, surface water or groundwater. The health impacts of cadmium exposure are innumerable. It can lead to respiratory problems, bone deformities, anaemia, increase possibilities of lung cancer, birth defect, etc. Therefore, regulating the disposal and recycling of battery waste, often a neglected issue particularly in developing and poor countries, is far more important compared to battery production.

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¹ Priti Mahesh and Manjusha Mukherjee, *Dead and Buried: A Situation Analysis of the Battery Waste Management in India*, TOXIC LINKS, 1, 28 (2019), <https://toxicslink.org/docs/Dead%20And%20Buried.pdf>.

However, recycling of batteries and its disposal is a critical issue globally. The concerns in comparison to most other countries are greater in India as single use batteries dominate the battery market in contrast to rechargeable batteries. Due to little or no monetary value attached to used batteries, a huge number of it gets discarded with household wastes.

While the existing legislative framework in India provides for regulations to manage lead acid batteries, there are no regulatory framework to ensure efficient recycling and disposal of other batteries such as household batteries or small batteries. In the absence of any infrastructure at present for its collection and treatment, the fate and the impact on environment of the enormous amount of small batteries waste generated in the country is uncertain. Although batteries are included as a part of domestic hazardous waste under the Municipal Waste Rules, 2016, the country lacks appropriate facilities to manage the billions of batteries generated annually. There is an absence of systematic collection and recycling facilities. There are added concerns of percolation of toxic and hazardous materials from the spent batteries due to lack of scientifically designed landfills. In addition to the problem of toxicity, the risk of depletion of these materials and its non-availability runs parallel. The batteries comprise of several non-renewable resources and carelessly discarding them into landfills would mean losing out on these resources.

In the light of these issues it therefore becomes imperative to analyse and evaluate the existing legislative framework with respect to the management of dry-cell batteries waste. The present paper aims to bring into light the need to consider efficient management of millions of batteries waste generated annually as it has the potential to cause severe hazards not just to the environment but also to human health.

The article will first develop in Part II, a quick background on environmental impact of dry cell batteries or household batteries. It then discusses briefly the existing legislative framework in India to address the problems posed by dry cell batteries waste in Part III. Notably, there is an absence of efficient guidelines to deal with the same. Therefore, Part IV briefly highlights the best practices to deal with used dry cells batteries waste. Finally, Part V

focuses on the analysis of the study and states the conclusion arrived at based on the discussion made in the previous chapters. Further, it suggests ways to streamline the existing regulatory mechanism in India to deal with dry cell batteries waste.

II. Environmental and Human Health Impact of Dry Cell Batteries

Non-rechargeable batteries still dominate Indian markets because of their low cost and preference over the expensive ones. It is estimated that around 2.7 billion pieces of dry cell batteries are being annually consumed in India. Of the dry cell batteries, zinc-carbon cells account for 97% of the market share. These batteries are used in a variety of devices, such as cars, TV remotes, laptops, watches, medical devices, etc. However, the shelf life of these batteries is generally short. Around 90% of these used zinc-carbon cells end up in landfills along with household waste. These batteries contain a variety of heavy metals and chemicals in varied concentrations which permeates into the soil, groundwater and surface water, thereby contaminating the environment. Consumption of food and water contaminated by such heavy metals can also cause neurological impacts, kidney damage, birth defects and cancer.² Majority of the dry cell batteries are sold in the rural areas, thereby raising concerns of toxic contents leaching not just in landfills but also agricultural fields. Improper disposal of these wastes unnecessarily squanders resources and energy. The single-use batteries contain many non-renewable resources. In the absence of an efficient recycling mechanism or regulatory framework to ensure resource recovery and effective management of these wastes, these important resources may be lost forever.

III. End-Of-Life Dry Cell Batteries Management Regulations in India.

In India, despite adoption of several waste management regulations from time to time, efficient management of batteries waste still remains unaddressed. The Batteries (Management and Handling) Rules, 2001³ ('B(M&H) R,2001') along with its subsequent amendment in 2010 by the MoEF&CC have been adopted for the appropriate handling and disposal of Lead Acid Batteries (LABs). A Deposit Refund System is established under these

²Priti Mahesh and Manjusha Mukherjee, *Dead and Buried: A Situation Analysis of the Battery Waste Management in India*, TOXIC LINKS, 1, 28 (2019), <https://toxicslink.org/docs/Dead%20And%20Buried.pdf>.

³ MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, GOVERNMENT OF INDIA, <http://moef.gov.in/wp-content/uploads/2017/08/Battery-Rules-2001-English.pdf> (last visited Jan. 22, 2022).

Rules for the recycling of LABs. The Rules mandate the selling of Used LABs (ULABs) procured by retailers only to registered recycler, who are in turn required to recycle the lead using environmentally friendly processes. Additionally, the manufacturers and importers are required to be part of the buy-back system. However, these Rules are not applicable to small batteries.

No separate regulations have been so far adopted for the management of small batteries in India. However, under the Solid Waste Management Rules, 2016, 'used batteries' have been defined as 'domestic hazardous waste' along with paint and pesticide containers, expired medicines, CFL etc. The Rules mandate segregation of such waste at source and deposition centres and also introduces Extended Producer Responsibility (EPR). However, the EPR is restricted to manufacturers of packaging products such as plastic, tin, glass, etc and does not apply to small batteries.

The Rules lay down the following provisions for domestic hazardous waste:

- The waste generators are required to maintain segregated storage and handing over of such domestic hazardous wastes.
- Waste generators are required to set up in cities of towns, one waste deposition centre per twenty square kilometre area for safe disposal of the domestic hazardous wastes. The centres must indicate the deposit directions and timing notifications for receiving the waste.
- The Rules mandate creating public awareness on segregation at source of the domestic hazardous waste.
- It mandates the management of hazardous waste in line with the Hazardous Waste Management Rules, 2016.
- It requires land filling of waste containing hazardous material in composite liner HDPE geo-membrane.

However, all provisions under the Rules are directed towards aggregated domestic hazardous waste. No separate segregation or deposit centre for batteries have been specified. Also, for

small battery producers there is no mandate for EPR or even recycling of the battery resources through any other formal network.

Moreover, once the sanitary landfills are set up and in operation (timeline 1 year from the implementation of the rule), land filling and dumping of mixed waste are prohibited. Also, the types of waste that can be discarded into these landfills have also been specified. Only residues from waste processing facilities, unusable, non-recyclable, non-biodegradable, non-combustible and non-reactive inert waste and pre-processing rejects can be discarded into these sanitary landfills. Thus, the Rules require disposal of batteries into hazardous waste disposal facilities. However, according to a recent study by Toxic Links, the batteries mostly end up in landfills as pre-processing rejects from the waste processing facility.⁴

Import and export of waste batteries other than those containing lead, cadmium and mercury are also not restricted under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2015. Under Schedule IV, used batteries except LABs are listed as commonly recyclable hazardous waste. However, for small battery waste, secured land filling is the only provision made under the Rules. There are only 17 hazardous waste disposal facilities with secured landfills in India. Lack of scientifically designed landfills adds to the concerns of leaching of toxic materials from the spent batteries. Also, the country lacks formal recycling unit for used batteries. However, despite this, import of the batteries waste stands unregulated.

In addition to this, the implementation of the existing guidelines for household hazardous waste is near to zero. The country lacks in both legislating and enforcing the management of used small batteries. Household waste batteries are a concern which needs to be looked at.

IV. Good Regulatory Framework Adopted in other Countries for Management of Dry Cell Batteries

4.1. U.S.A.

⁴ *Supra* note 1, at 30.

The Universal Waste Regulations was enforced by the US EPA to establish management standards certain categories of hazardous waste. The Regulation classifies batteries, pesticides, mercury-containing equipment and lamps as universal waste.⁵ It aims to facilitate the collection and recycling of such wastes so as to ensure that the management of these wastes do not harm the human health and environment; relax the packaging, handling and other regulatory requirements for retail stores and other generators wishing to collect such waste and transporters of such waste, and to facilitate the development of municipal and commercial programs to reduce the amount of such waste going to municipal solid waste landfills or combustors.⁶ In the universal waste system, small quantity handlers, large quantity handlers, transporters and destination facilities of universal wastes are the regulated participants.⁷ It encompasses labelling requirements for product recycling, measures for preventing release of harmful substances into the environment, response measures in case of releases and transportation facilities for recyclers or receivers of hazardous waste. However, the safe disposal rules for household batteries, according to their types were framed in the US way back in 90s.

The Battery Act, adopted in 1996, facilitates the collection and recycling of Ni-Cd and certain SSLA rechargeable batteries. Alkaline, carbon zinc batteries are classified as non-hazardous waste and are required to be disposed of in trash along with normal municipal waste, except in California, which requires the disposal of these batteries in accordance with California Universal Waste Rules. Button cells used in watches, hearing aids, toys, etc are classified as hazardous waste. They are required to be kept separately from non-mercury batteries and must be taken to a household waste collection site. Similarly, Ni-Cd batteries are classified as hazardous wastes and are required to be taken to a household hazardous waste collection site.⁸

In North America, the Rechargeable Battery Recycling Corporation developed an end-of-life household battery recycling programme called Call2Recycle. It has been adopted in 48 states

⁵ United States Environment Protection Agency, <https://www.epa.gov/hw/universal-waste>.

⁶*Id.*

⁷*Id.*

⁸ EHSO, (Jan.04, 2022), <http://www.ehso.com/batteries.php#Regulations>.

in the continent and has been operation for over 20 years. It has successfully recycled over 100 million pound of batteries and has 30,000 drop-off collection sites across US and Canada. It aims to keep out certain categories of batteries waste, such as Ni-Cd, Ni-MH, lithium, SSLA and single used batteries including alkaline and lithium out of the solid waste stream and prevent toxins from entering the landfills or municipal incinerators. Different recycling plans have been adopted for different stakeholders. The programme also has provisions for becoming collection partners under the pay-as-you-go facility, recycling by organizations through payments, free drop-off recycling networks, etc. It also promotes the participation of other organization by involving them in the recycling process through payments. Batteries collected by the public and private agencies, retailers, businesses, municipalities, etc. are sent for sorting, processing and recovery. Certain batteries such as nickel (rechargeable), alkaline and primary zinc cells are sent to International Metals Reclamation Company in Pennsylvania. Mandates of Responsible Recycle (R2) and Basel Action Network (BAN) standards are followed for the disposal of waste.

In the US, for recycling Ni-Cd batteries, the cadmium distillation process is used and the BATENUS process has been developed for treating dry cell battery.

4.2. E.U.

The Directive 2006/66/EC⁹ adopted by the European Commission covers all battery types. It lays down detailed guidelines for the collection, recycling, treatment, and disposal of batteries in an appropriate and environmentally sound manner. Developed in line with public consultation, extended impact assessment, and a special conciliation process, the Directive aims to limit up to 5ppm mercury and 20ppm cadmium content in batteries and to meet significant collection and recycling targets.

In addition to the 2006 Directive, several other collection and recycling models, and national schemes have been adopted in different countries across Europe to manage various hazardous

⁹ Council Of European Union, (Feb.04, 2022) <https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32006L0066&from=EN>.

and non-hazardous battery types. The responsibility for funding the collection models of waste batteries has been entrusted to battery manufacturers, retailers, OEMs, and importers. Some of the collection models can be discussed as follows:

- **State fund model:** under this model, the producers are entrusted with the responsibility to fund the waste battery collection models. A government organization, municipal or regional authority is empowered to decide the collection operations that are required to be funded. The producer accordingly has to pay the requisite fees to a designated waste management fund, or the government can collect the required fund through a system of taxation. A model dedicated solely to battery waste management can be adopted or the same can be clubbed with other waste management project.
- **Single organisation (environmental agreement) model:** this model represents an environmental agreement with the government, where the duty to fund and organise battery waste management is entrusted upon the entire manufacturing sector. The management is done through a single organisation and in case the collection targets are not met, taxes are enforced upon the battery producers.
- **Competing organisations model:** under this model, the take-back obligation of producers is assumed by organisations authorised by the government. These organisations compete with each other with respect to the fees charged from producers, to cover the cost of battery waste management and to take it to collection targets.
- **Model without organisation:** under this model, authorised waste battery companies (collectors and transporters) are directly financed by the producers to meet the collection targets imposed on him. There are no legal provisions to authorize organizations to coordinate the management of battery waste on behalf of producers. However, battery producers there fulfil a similar role as collective organizations through service providers whilst the individual producer retains the take-back obligation.

Other than the collection models, several noteworthy recycling practices have also been adopted. Germany, for instance, mandates battery producers to collect their products from consumers via GRS Batteries Foundations' nationwide containers. The filled containers are then sent by the GRS to sorting facilities, where valuable materials and metals are recovered according to their electrochemical class. A mineral processing technique by means of vacuum milling has been developed by NIREC, a company in Germany. Through this recycling process, nickel is separated and sent as raw material for secondary metallurgy. The system places procedural emphasis on separating, reclaiming and utilizing the high-quality nickel content and ensuring that the potential hydrogen risk is eliminated. The entire process is performed in a vacuum environment using a vacuum system. Cutting chambers are set in place to open up the casing and release the hydrogen stored in these batteries. Once this is completed, the battery is then collected in a container and kept under monitoring. The batteries are monitored during the stabilization period with the help of sensors and then are aerated to inert them and take out the material. Once the plastic content is separated, a product with high nickel content is obtained which can be reused.

In Belgium, a recycling process for zinc-carbon and manganese-alkaline batteries has been developed by the company MMM-Sedema. The batteries are processed mechanically to reclaim metallic fraction. The waste generated in this process is a black powder consisting essentially of carbon, manganese and zinc. The powder is leached, producing a solution which is rich in manganese and zinc. The solution is purified, and it produces manganese and zinc salts.

V. Conclusion and Suggestions

It is clear that in the current Indian scenario there are significant deficiencies in the regulatory framework, accountability for battery waste management in India. No regulatory frameworks have been adopted for the management of dry cell batteries. Battery waste and its management is a critical concern which requires urgent attention for its potential to adversely impact environment and health, resource recovery opportunities and the ever-increasing rate of consumption.

Upon perusal of the findings of the available literature, analysis of measures taken by Government of India and in the light of the policies implemented by other countries like U.S.A and E.U., the following suggestions are recommended to improve the situation:

- At present, there is no comprehensive legislative framework for dry cell batteries. There is a mere mention of small batteries under the Solid Waste Management Rules. In the absence of any specific regulatory framework, recycling of waste dry cell batteries is almost non-existent. Therefore, there is a need to adopt a regulatory instrument specifically for dry cell batteries.
- EPR for manufacturers and retailers of batteries should be introduced so that used dry cell batteries are collected and properly channelized to authorised recyclers. The manufacturers can through EPR programs ensure that discarded batteries are handled with convenience by the consumers. With producer funding, EPR can provide an effective, sustainable financing system that increases leftover battery collection and recycling, lower the cost of battery management and decrease the environmental impact
- Publicly accessible locations or infrastructure such as schools, showrooms, petrol pumps, etc. can be designated as collection or drop-off points for used dry cell batteries under the EPR program.
- Prohibition should be imposed on disposal of dry cell batteries and other waste residues in landfills or by incineration. This will encourage the introduction of suitable technologies and the establishment of organized recycling facilities to facilitate the maximum recovery of resources in an efficient manner.
- National uniform labelling standards should be mandated for all batteries and products containing batteries. Information relating to type of battery, its disposal and recyclability criteria must be distinctly mentioned.
- Standards for recycling and disposal of waste batteries should be adopted. Mandatory registration for recyclers should be introduced to ensure that the dry cell batteries waste

end up at authorised centres. The government should encourage the recycling of waste batteries through subsidies, product stewardship and disposal costs.

- The government, at both the state and local level can help in successful implementation of battery recycling programs through public education. Education committees can be established to devise a comprehensive strategy for imparting local education. This will indeed increase community's awareness on the need to reduce toxic batteries in the waste stream. Also, workshops can be conducted to better apprise the industries and businesses on the importance of recycling. Consumer awareness and participation is crucial. Measures should be taken to inform them of the segregation methods that can be adopted at the household level, facilities for drop-off and the importance of recycling the batteries waste.



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