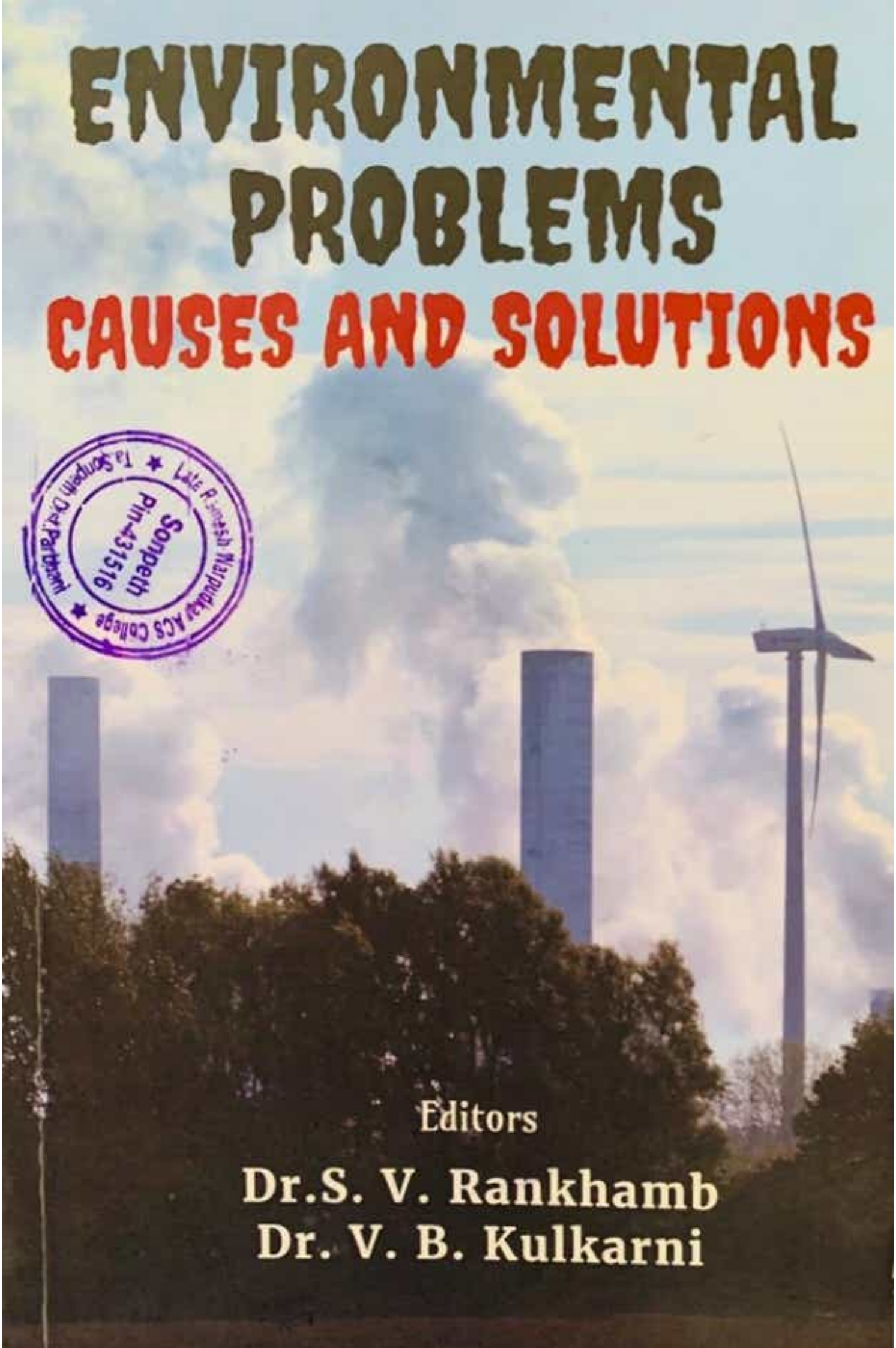
ENVIRONMENTAL PROBLEMS

CAUSES AND SOLUTIONS



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BIOMEDICAL WASTE MANAGEMENT IN INDIA

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Biomedical waste is "Any solid and/or liquid waste including its container and any Intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals.
human beings or animals".

Biomedical waste may be solid or liquid. Examples of infectious waste include discarded blood, sharps, unwanted microbiological cultures and stocks, identifiable body parts , human or animal tissue, used bandages and dressings, discarded gloves, other medical supplies that may have been in contact with blood and body fluids, and laboratory waste that exhibits the characteristics described above. Waste sharps include potentially contaminated used and unused discarded needles, scalpels, lancets and other devices capable of penetrating skin. [1]

Biomedical Waste (BMW) is the biggest problem in the world. As Proper management of biomedical waste in accordance to the stipulated rule was one of the neglected aspects especially in developing countries like India. Since the BMW Management Rules, 2016 by Government of India (GoI), Ministry of Environment, Forest, and Climate Change initiated changes by

prescribing simplified categories (color coded) for segregation of different BMWs, an amendment in 2018 also came into force with the aim to improve the compliance to the rules. [2, 3] Proper segregation, handling, and disposal remained a serious concern for health care facilities across India.

The GOI guidelines for segregation of bio-medical waste recommend the following color coding [4]

- **Red Bag** – Syringes (without needles), soiled gloves, catheters, IV tubes etc. should be all disposed of in a red colored bag, which will later be incinerated.
- **Yellow Bag** – All dressings, bandages and cotton swabs with body fluids, blood bags, human anatomical waste, body parts are to be discarded in yellow bags.
- **Cardboard box with blue marking** – Glass vials, ampules, other glass ware is to be discarded in a cardboard box with a blue marking/sticker.
- **White Puncture Proof Container (PPC)** – Needles, sharps, blades are disposed of in a white translucent puncture proof container.
- **Black Bags** – These are to be used for non-bio-medical waste. In a hospital setup, this includes stationary, vegetable and fruit peels, leftovers, packaging including that from medicines, disposable caps, disposable masks, disposable shoe-covers, disposable tea cups, cartons, sweeping dust, kitchen waste etc.

During COVID-19 pandemic, initial experiences shows that problem of BMW has become a worst, with piles of personal

protective equipment (PPE) accumulating in the hospitals, Masks thrown on open spaces etc. (Fig. 1).

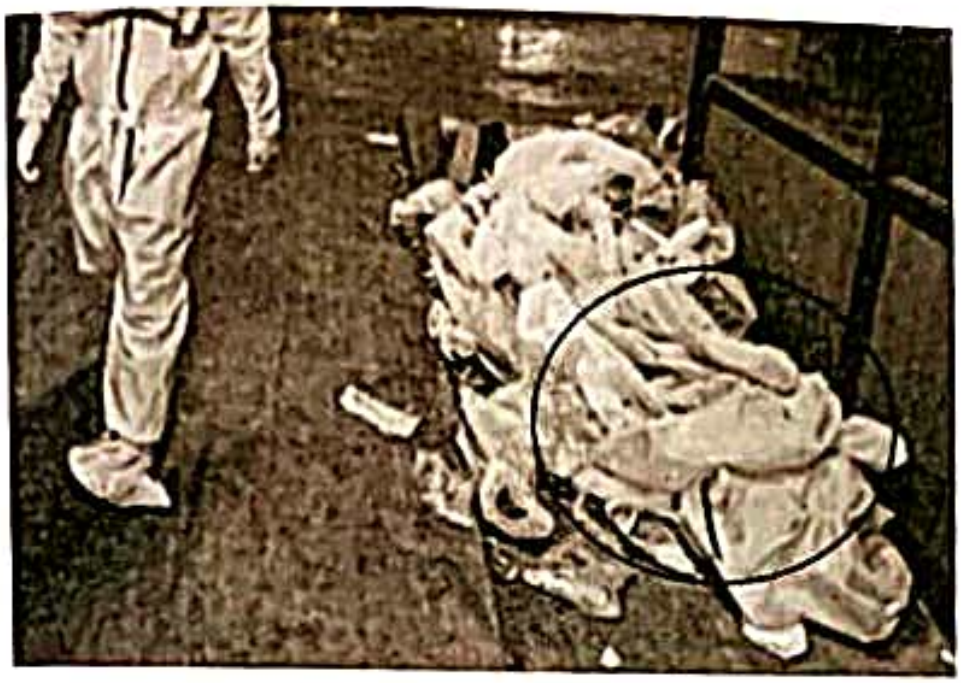

Fig. 1 – The pile of personal protective equipment

In spite of the guidelines by World Health Organization and Ministry of Health and Family Welfare, GoI regarding the rational use of PPE for COVID-19, health care settings are experiencing high demand of PPE from all strata of health care workers owing to the fear of infection. [5,6] The apprehension is often resulting in the misuse of PPE on many occasions aggravating the problem by generating huge quantity of BMWs which are difficult to store and transport with limited resources and manpower available at the time of crisis. Added to the menace, is the indiscriminate use and disposal of single-use surgical masks even in the community (Fig. 2).

Fig. 2 – Used Masks thrown on open spaces

India has generated 18,006 tonnes of biomedical waste in four months (June-September), as per Central Pollution Control Board (CPCB) data. Maharashtra generated a whopping 3,587 tonnes of Covid-19 biomedical waste, followed by Tamil Nadu (1,737 tonnes), Gujarat (1,638 tonnes), Kerala (1,516 tonnes), Uttar Pradesh (1,432 tonnes), Delhi (1,400 tonnes), Karnataka (1,380 tonnes) and West Bengal (1,000 tonnes). The report for the month of September also revealed that 5,500 tonnes of Covid-19 waste was generated in one month. [7]

In response to the COVID-19 pandemic in India, CPCB, Ministry of Environment, Forest & Climate has published guidelines for the management of waste generated during treatment/diagnosis/quarantine of COVID-19 patients. [8] These guidelines have advocated use of double layered bags (using two bags), mandatory labeling of bags and containers as "COVID-19 waste," regular disinfection of dedicated trolleys, separate record keeping of waste generated from COVID-19 isolation wards, in addition to the recommendation for following existing practices of BMW Management Rules, 2016.

Suggestions –

- Government has taken good effort to prepare rules and regulation for the management of the BMWs but a separate system should be developed for surveillance and strict implementation of these regulations.

- Hospitals, Laboratories, research institutions etc. should develop their own BMW management system which must work in accordance to the rules and regulations laid by WHO, GoI and other government recommended authorities. These Institutions should conduct regular training of all concerned staffs for BMW management and monitor the practices.

- As is evident from the current COVID-19 pandemic, basic infection control practices are the only measures for containment and Proper waste disposal is an integral part of these control measures.
- Biomedical waste this concept is unknown to many peoples hence it is frequently collected by unauthorized scrap collector and it is disposed by unscientific way it is biggest problem in India regarding BMW, it can be reduced by awareness campaigns, strict implementation of laws and training to this unauthorized sector.

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