

Valorization of Waste for Environmental Sustainability

Entrepreneurship opportunity and livelihood security



Editors: Ashish Khandelwal
Akriti Sharma, Bhupinder Singh,
Manoj Shrivastava, Renu Singh

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Progress Through Science

Foreword



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Among others, agriculture and industrial waste also has the major potential to boost the economy. These sectors are generating an enormous amount of waste material each year and causing significant pollution and reduction in the carrying capacity of the earth, which results in decreasing soil, water and air quality. More conscious and responsible management of our production system is extremely necessary, since it is imperative to preserve and better manage our natural resources. Hence, the possibility of valorising agricultural waste by converting it into substances and materials that can be used to improve crop performance and soil quality. Globally about 1.3 billion tons of food products for human consumption is wasted every year which include one-third of biodegradable municipal solid waste mainly the domestic kitchen wastes. In India, about 4.43 million tons of hazardous (industrial) wastes are generated annually, out of which 71,833 tons are destroyed by burning. Realistically, in the coming years, losses in agricultural productivity of up to 70 per cent are expected for climate change and the progressive degradation of primary resources (mainly soil and water).

The agricultural wastes have immense potential to generate electricity and biofuel, and for value-addition. As per the report of Ministry of New and Renewable Energy (MoN&RE), 18,000 mw of power can be generated each year from agricultural waste. Its improper management causes severe illness, disease, disfunction of organs, environmental pollution, production of greenhouse gases/ obnoxious gases around the landfill sites. At present, only 15-20 per cent waste is recycled, reused and converted into composting, biochar, pesticides, nanomaterials, energy, value-added products, protein, soilless planting media, enzyme production, source of raw materials for industry, gelling agent, binders, cosmetics, and contributes towards income generation and country's economy.

This book entitled "Valorisation of Waste for Environmental Sustainability-Entrepreneurship Opportunity and Livelihood Security" covers different aspects of utilization of wastes in producing biogas and bio-slurry as fuel and source of fertilizer, raw materials for mushroom production, biofuel production process, value-addition using ornamental materials, and horticultural wastes as source of pesticides, 'Pusa Decomposer' for rapid composting, etc. I am sure this documentation will definitely attract students, farmers, professionals, and entrepreneurs in creating awareness for business ventures and for employment opportunities.

I profusely congratulate the authors for their sincere efforts in writing this book which is not only relevant but timely also.

(R.S. Paroda)

(Padma Bhushan Awardee)

Chairman, TAAS

and Former Secretary, DARE &

DG, ICAR (Govt of India)

Preface

This book is being brought out on the occasion of five days training program on “*Entrepreneurship opportunities in agricultural and industrial waste management for environmental sustainability*”. The training program is jointly organized by Zonal Technology Management and Business Plan Development Unit, Division of Environment Science, ICAR-Indian Agricultural Research Institute, New Delhi and Young Professionals for Agricultural Development-India. The financial assistance received from RKVY-RAFTAAR towards printing of the book is immensely acknowledged.



The book covers a wide range of topics for utilization of waste materials, value addition, and circular economy. The book covers several aspect such as utilization of cow dung, waste produce for fuel and bio slurry preparation, mushroom production, compost preparation, engineering intervention for utilization of agricultural waste, production of biofuels, microbial approaches for degradation of plastic, entrepreneurship development through value addition in ornamentals using agricultural waste, biofuel production process, application of horticultural waste as a source of pesticides, approaches for plastic management, use of PUSA decomposer for rapid composting, approaches for conservation agriculture, utilization of waste from sugar and molasses based industries, technology development for mass production of blue green algae and its utilization as nutrient rich formulation, and a success story for conversion of waste to art to waste to wealth.

The publication has been made possible by the cooperation and support from the participants who readily agreed to prepare the valuable articles and taking active part in the deliberations. The book underpins the implications of congruence of environmental, social, and economic aspects of waste management to serve the three Ps of People, Planet, and Prosperity.

I am happy to learn that most demanding topic of entrepreneurship opportunities is a coverage of this training program and visit to waste to electricity plant and thermal power plant will help young entrepreneurs, farmers, professionals and different stakeholders to understand the value addition opportunities using waste materials. I am sure that the deliberations of the different authors will help different participants for entrepreneurship opportunity and livelihood security.



(R.B. Singh)

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