

# **Waste Management, Waste disposal and Recycling Industry**

## **Modern Technology of Agro Processing & Agricultural Waste Products**

**Author:** NIIR Board

**Format:** Paperback

**Book Code:** NI11

**Pages:** 504

**ISBN:** 8186623493

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Agriculture being a foundation stone for most budding economies, it would be benefiting to know about agro processing and waste management of agriculture produce. The book will act as an encyclopaedia for enriched information on the processing of a variety of products manufactured from agro crops and the waste management of agriculture products. Agro processing can be defined as set of techno economic activities carried out for preservation and treatment of agricultural produce and to make it useful as food, feed, fibre, fuel or manufacturing objects . Therefore, the span of the agro-processing industry covers all operations from the phase of harvest to the phase where the material reaches the end users in the desired form, packaging, quantity, quality and price. Agro processing is a complex process and a clear understanding will certainly help to grow your business. The agro processing is functional to all the produces, originating from agricultural farm, livestock, aqua cultural sources and forests for their preservation, treatment and value-addition to make them serviceable as food, feed, fibre, fuel or industrial raw materials. The book deals with varied information on the agro product like Quality Parameters of Dehydrated Fruits and Vegetables, Fruit Specific Preservation Technologies, General Properties of Fruits and Vegetables; Chemical Composition and Nutritional Aspects; Structural Features. Some chapters provide information on the various by products of agro products like Alcohol from Potatoes, Activated Carbon from Saw Dust, Rice Husk and Coconut Shells, Cattle Feed from Molasses, Bio coal Briquettes from Agriculture Cellulosic Waste, Maize Processing for Glucose etc. The book also gives a touch to the growth of agro processing Industries in India that has experienced expansion during last 5 decades, starting with a handful of facilities to the present level. The book in addition contains the number of products made from agricultural waste. With the current expansion and growth of agro processing and the waste management the book will render you comprehensive information on the project profiles, requirements of basic infrastructure like plant, machinery and raw materials and the addresses of their suppliers. Agro processing has recently emerged as the dawn sector of the Indian economy with its enormous prospective for growth and direct assistance to economic aspect especially on employment and income generation. A number of estimates propose that in developed countries, up to 14 per cent of the total labour force is engaged in agro-processing sector directly or indirectly. Though, in India, a meagre number of 3 per cent of the work force finds employment in this sector revealing its underdeveloped state and vast untapped potential for employment. The book will provide you comprehensive information to tap the opportunities available in the sector.

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## [Products From Waste \(Industrial & Agro Waste\) 2nd Edition](#)

**Author:** NIIR Board

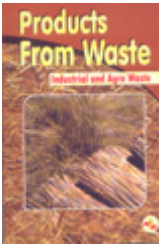
**Format:** Paperback

**Book Code:** NI76

**Pages:** 608

**ISBN:** 818662337X

**Price:** Rs. 975.00 **US\$** 100.00



Processing of useful products from waste is achieved by Integrated Waste Management (IWM) which is the most important approach for the management of wastes. Rather than incurring the costs and risks of managing waste, it has been recognized, it is better to reduce the generation of waste. A waste minimization approach is outlined, in order to save costs and greatly minimize environmental liability. The major technique for waste management is recycling, though recycling and use reuse are the two major techniques for waste minimization, the options must be carefully evaluated. In the chemical industry, recovery of solvents, metal values, lubricant and oils has proven particularly cost effective in many countries. There are many such products processed from industrial and agricultural waste like silicon from rice husk, caffeine from tea waste. Here we are going to describe the waste management options and risks of hazardous waste and technologies related to it. Integrated waste management approach is one of the essential components of any successful waste management programme to control hazardous waste. Hazardous waste management is a new concept for most of the Asian countries including India. The utilization of resources and generation of waste is for beyond the limit that the biosphere was made to carry. This book basically describes about the waste management options and technologies for the treatment and disposal of hazardous waste, economic policies and analysis in effluent treatment and financial constraint, municipal waste water treatment and energy recovery, cogeneration: a technology in waste reduction, utilization of industrial wastes in cement manufacture, quality and stability factors in composting, environmental legislation and enforcement mechanism etc. We have made a sincere effort to bring out this book which is a key to the goldmine which can be obtained from waste. For the conservation of our environment and sustainable development, we have tried to bring about the solution. This book is a careful attempt in bringing together some selected articles from both entrepreneurs and specialist on all that is possible in the field of waste management.

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## [Modern Technology of Waste Management: Pollution Control, Recycling, Treatment & Utilization](#)

**Author:** NIIR board

**Format:** Paperback

**Book Code:** NI78

**Pages:** 632

**ISBN:** 8178330849

**Price:** Rs. 975.00 US\$ 100.00



Waste management is the collection, transport, processing or disposal, managing and monitoring of waste materials. The term usually relates to materials produced by human activity, and the process is generally undertaken to reduce their effect on health, the environment or aesthetics. Waste management is a distinct practice from resource recovery which focuses on delaying the rate of consumption of natural resources. The management of wastes treats all materials as a single class, whether solid, liquid, gaseous or radioactive substances, and tried to reduce the harmful environmental impacts of each through different methods. Rapid industrialization last few decades have led to the depletion of pollution of precious natural resources in India depletes and pollutes resources continuously. Further the rapid industrial developments have, led to the generation of huge quantities of hazardous wastes, which have further aggravated the environmental problems in the country by depleting and polluting natural resources. In fact, man today is caught in the vicious circle of increasing wants, declining resources and increasing waste being generated by the industries and municipalities is posing a problem of enormous dimensions. The domestic and industrial effluents are contributing in enhancing this problem. It might become the biggest problem if it is not dealt with immediately. Therefore, rational and sustainable utilization of natural resources and its protection from toxic releases is vital for sustainable socioeconomic development. Hazardous waste management is a new concept for most of the Asian countries including India. The utilization of resources and generation of waste is for beyond the limit that the biosphere was made to carry. This book majorly deals with industrial waste, industrial waste water technology, modern technologies for water pollution control, water recycle & product recovery air pollution control, environmental management system (EMS), surface active agents and contamination of water, physical methods for the treatment of organic acid bearing wastes, realities of waste cyanide treatment in India, biological treatment of aqueous wastes, plastics and generated wastes, alginate industry waste a source of biogas, acid charred waste as a resource material for highly active adsorbent. We have made a sincere effort to bring out this book which helps in minimizing the problem. For the conservation of our environment and sustainable development, we have tried to bring about the solution. This book is a careful attempt in bringing together some selected articles from both entrepreneurs and specialist on all that is possible in the field of waste management.

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## [Medical, Municipal and Plastic Waste Management Handbook](#)

**Author:** NIIR Board of Consultants & Engineers

**Format:** Paperback

**Book Code:** NI145

**Pages:** 544

**ISBN:** 8186623914

**Price:** Rs. 1,275.00 **US\$** 125.00



Waste management is the collection, transport, processing, recycling or disposal, and monitoring of waste materials. Concern over environment is being seen a massive increase in recycling globally which has grown to be an important part of modern civilization. The consumption habits of modern consumerist lifestyles are causing a huge global waste problem. Rapid urbanization and industrial diversification has led generation of considerable quantities of municipal, plastic, hazardous and biomedical waste. Further the rapid industrial developments have, led to the generation of huge quantities of hazardous wastes, which have further aggravated the environmental problems in the country by depleting and polluting natural resources. Therefore, rational and sustainable utilization of natural resources and its protection from toxic releases is vital for sustainable socioeconomic development. Hazardous waste management is a new concept for most of the Asian countries including India. The utilization of resources and generation of waste is for beyond the limit that the biosphere was made to carry. Recycling of plastics should be carried in such a manner to minimize the pollution level during the process and as a result to enhance the efficiency of the process and conserve the energy. The concern for bio medical waste management has been felt globally with the rise in infectious diseases and indiscriminate disposal of waste. It is to be understood that management of bio medical waste is an integral part of health care. There is a clear need for the current approach of waste disposal in India that is focussed on municipalities and uses high energy/high technology, to move more towards waste processing and waste recycling (that involves public private partnerships, aiming for eventual waste minimization driven at the community level, and using low energy/low technology resources. This book basically deals with characterization of medical waste, medical waste data collection activities, medical waste treatment effectiveness, gas sterilization , medical waste reuse, recycling and reduction, selection of waste management options, fundamental concepts related to hospital waste incineration , linkage of bio medical waste management with municipal waste management , waste identification and waste control program for the health care establishments, waste treatment and disposal : the rules and the available options , recycle spoiled photographic film and paper etc. Waste management is one of the essential obligatory functions of the country. This service is falling too short of the desired level of efficiency and satisfaction resulting in problems of health, sanitation and environmental degradation. This book provides overview of the status of medical, municipal and plastic waste management. A treatment technique includes sterilization, incineration and number of recycling methods.

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## [Water and Air Effluents Treatment Handbook](#)

**Author:** NPCS Board of Consultants & Engineers

**Format:** Paperback

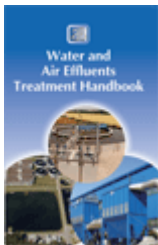
**Book Code:** NI217

**Pages:** 576

**ISBN:** 9788178331195

**Price:** Rs. 1,275.00 US\$ 125.00

Water treatment describes those processes used to make water more acceptable for a desired end use. These can include use as drinking water, industrial processes, medical and many other uses. The goal of all water treatment process is to remove existing contaminants in the water, or reduce the concentration of such contaminants so the water becomes fit for its desired end use. Water quality analytical techniques are considered in the context of EEC directives on the quality of the aquatic control of all effluents is entering it. The principal methods of water analysis are reviewed and it indicated in view of destructive and hazardous role of pollution, it become necessary that the very nature of atmosphere, the various air effluent are present there to save the environment from the harmful effect. Effluent can be treated in different ways, it is classified as; preliminary treatment, primary treatment, secondary treatment and complete final treatment. Waste water obtained from industries is generally much more polluted than the domestic or even commercial waste water. Industrial wastewater cannot be always treated easily by the normal methods of treating domestic waste waters. Depending on the quantum, concentration, toxicity and presence of non biodegradable organics in an industrial wastewater, its treatment may consist of any one or more processes such as equalization, neutralization, physical treatment, chemical treatment and biological treatment. The atmosphere contains hundreds of air pollutants from natural or from anthropogenic sources. All such pollutants are called primary pollutants for example; sulphur oxides, carbon monoxide, nitrogen oxides, lead etc. Secondary pollutants are the chemical substances, which are produced from the chemical reactions of primary pollutants or due to their oxidation etc. A high growth in vehicle population brings in its wake urban air pollution problems unless timely appropriate steps to control vehicle emissions are under taken. Some of the fundamentals of the book are quality and characteristics of effluents, collection of sewage samples for physical and, chemical testing, disposing of effluents, disposal of wastewaters in lakes and management of lake waters, disposal of sewage effluents on land for irrigation, classification of treatment processes, treatment of industrial effluents, methods of treating industrial wastewaters, strategies for management of industrial wastes, combined industrial municipal wastes, a process for upgrading paper mill effluent by water hyacinth, ventilation for controlling indoor air pollution, the environment and its pollution, disposal of environmentally hazardous radioactive effluents and biomedical wastes, air pollution, its control and monitoring, fuels from waste etc. This book is an effort to put together the various options available to meet the water and air effluent available for the environmental protection. The book presents a concise but through an overview of state of technology for water and air effluent treatment. The water and air effluent treatments are organized into chapters by broad problem area, treatment of industrial effluent, industrial waste management, etc. This will be helpful to technocrats, consultants, educators, architects, industry executive, students and others concerned with saving environment problem.



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[\*\*The Complete Book on Managing Food Processing Industry Waste\*\*](#)



**Author:** H. Panda

**Format:** Paperback

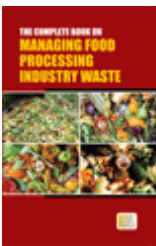
**Book Code:** NI245

**Pages:** 400

**ISBN:** 9788178331454

**Price:** Rs. 1,275.00 **US\$** 125.00

Food industry produces large volumes of wastes, both solids and liquid, resulting from the production, preparation and consumption of food. These wastes pose increasing disposal and can pose severe pollution problems and represent a loss of valuable biomass and nutrients. Many standard industrial waste treatment texts sufficiently address a few major technologies for conventional in plant environmental control strategies in the food industry. Environmental legislation has significantly contributed to the introduction of sustainable waste management practices worldwide. Considering the challenges in the area of food industry, efforts are to be made to optimize processing technologies to minimize the amount of waste. Food processing wastes have a potential for conversion into useful products of higher value as by product, or even as raw material for other industries, or for use as food or feed after biological treatment. There are many examples of utilizing waste materials from plant material processed by canneries, there are many other types of waste that can be utilized. In many canneries, the organic from the processing system is combined with the other types of non usable wastes, such as hardware, glass, cans, nails etc. Food industry should also have to concentrate on waste avoidance as well as utilization of process wastes. All the combined efforts of waste minimization during the production process, environmentally friendly preservation of the product, and utilization of by products would substantially reduce the amount of waste, as well as boost the environmental aspect of food processing industry. This book basically deals with utilization of food industry wastes, ultra filtration in the recovery of food waste, recovery of fruit and vegetable wastes, recovery of protein, the screening of vegetable wastes, fat extraction, treatment of fatty effluents, recovery and utilization of protein, conversion of bone to edible products, utilization of waste in animal feeds, production of earthworm proteins, use of microbiological agents in upgrading waste for feed and food, underutilized proteins for beverages, coffee and tea wastes, utilization of food waste in pet food industry, etc. Readers, technical institution, food technologists, technocrats, existing industries and new entrepreneurs will find valuable material in this book. This book gives a complete detail on invaluable waste management concepts, utilization of by-products and the practical methods to implement them. This book deals on the techniques and methods for food processing wastage. Comprehensive in scope, the book provides solutions that are directly applicable to the daily waste management problems specific to the food processing industry.



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## [The Complete Book on Biological Waste Treatment and their Utilization](#)



**Author:** Dr. H. Panda

**Format:** Paperback

**Book Code:** NI251

**Pages:** 504

**ISBN:** 9789381039236

**Price: Rs. 1,675.00 US\$ 150.00**



The organic waste stream is composed of waste of a biological origin such as paper and cardboard, food, green and garden waste, animal waste and biosolids and sludges. Organic waste is usually generated as a component of most waste streams. For information on the treatments for managing organic wastes click on the links to the right. Four significant components of this organic, biodegradable stream are from food preparation, agricultural production, livestock manures, and municipal sewage sludge. Organic waste from food sources includes vegetables, fruits, grains, meats, fish, dairy products, etc., and constitutes some 18% of the typical municipal organic waste stream. An average of 1 kg per person per day of organic waste is produced, originating from households, wholesalers & processors, restaurants, and institutions. Urban centers are the major generators of organic food waste. Agricultural waste includes waste made up of those materials such as manure and animal output, in either solid or liquid form from poultry or other livestock operations. It also includes harvest remains from grain, oilseed, vegetable, and orchard crops. Increase in biological waste has led to the increase in biological waste management technology. Waste management is the collection, transport, processing or disposal, managing and monitoring of waste materials. The book includes organic waste for biological treatment, organic waste forms and treatment strategies, transformation of liquid manure into a solid, modeling of agricultural waste treatments, utilization of Indian waste in livestock feeds etc. This book also explains the different types of organic wastes like waste from tomato, jute, cotton, agro-industries, dehydration process of onion, piggeries, poultry, milk parlour etc. This book describes the methods how organic waste can be converted into useful products like oxalic acid, oxytetracycline, humic acids etc. The book is highly recommended to new entrepreneurs, existing units who wants to get more information of organic waste treatment.

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[\*\*The Complete Technology Book on E-Waste Recycling \(Printed Circuit Board, LCD, Cell Phone, Battery, Computers\)\*\*](#)

**Author:** NPCS Board of Consultants & Engineers

**Format:** Hardcover

**Book Code:** NI288

**Pages:** 355

**ISBN:** 9788178331577

**Price: Rs. 1,975.00 US\$ 150.00**



Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for reuse, resale, salvage, recycling or disposal are also considered as e-waste. With advancements in the electronic world almost occurring on a day-to-day basis and increased availability of products to the public, it is not surprising to see a staggering increase in the generation of electronic wastes over the past decade. The e-waste now represents the biggest and fastest growing manufacturing of wastes with as high as about 40 million tons a year at the global level. All these things lead to an increase in E-waste generation in the country. Electrical and electronic equipment contain different hazardous materials which are harmful to human health and the environment, if not disposed of carefully. Due to the lack of awareness for e-waste recycling in emerging economies, innovation hubs and centres of excellence have not yet been established. This has led to the requirement of a proper disposal and recycling system so that environmental pollution and health hazard is reduced. We have tried to give information in this book which will help in minimizing this ever-growing problem. Today the electronic waste recycling business is in all areas of the developed world a large and rapidly consolidating business. This recycling is done by sorting, dismantling, and recovery of valuable materials. This diversion is achieved through reuse and refurbishing. This book aims at providing a thorough understanding and analysis of the E-Waste in the wake of evolving market dynamics. The book describes E-waste rules by Ministry of Environment and Forests. The book discusses the overview of the E-Waste Recycling along with their Classification, Composition, Recycling Process of different products and effects of E-waste on environment and human health. Also it contains suppliers' contact details of plant & machinery with their photographs. The book covers E-waste Recycling- An Introduction, Overview of WEEE/E-Waste Management, Hazardous Materials in E-Waste, E-Waste Management System Specifications, Recycling of E-Waste, Recycling of Printed Circuit Board, Recycling of Liquid Crystal Display, Cell Phones Recycling, Battery Recycling, Computer Recycling, Restriction of Hazardous Substances Directive and Environmental Aspects. It will be a standard reference book for Professionals, Decision-makers, Engineers, those Studying and Researching in this important area and others interested in the field of E-Waste Recycling. Professionals in academia and industry will appreciate this comprehensive and practical reference book, due to its multidisciplinary nature.

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## [The Complete Book on Biomass Based Products \(Biochemicals, Biofuels, Activated Carbon\)](#)

**Author:** NPCS Board of Consultants & Engineers

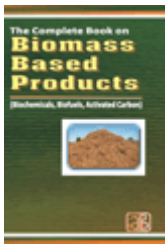
**Format:** Hardcover

**Book Code:** NI289

**Pages:** 417

**ISBN:** 9788178331584

**Price: Rs. 1,575.00 US\$ 150.00**



Biomass use is growing globally. Biomass is biological material derived from living, or recently living organisms. It most often refers to plants or plant-based materials which are specifically called lignocellulosic biomass. Biomass (organic matter that can be converted into energy) may include food crops, crops for energy, crop residues, wood waste and byproducts, and animal manure. It is one of the most plentiful and well-utilized sources of renewable energy in the world. Broadly speaking, it is organic material produced by the photosynthesis of light. The chemical materials (organic compounds of carbons) are stored and can then be used to generate energy. The most common biomass used for energy is wood from trees. Wood has been used by humans for producing energy for heating and cooking for a very long time. As an energy source, biomass can either be used directly via combustion to produce heat, or indirectly after converting it to various forms of biofuel. Conversion of biomass to biofuel can be achieved by different methods which are broadly classified into: thermal, chemical, and biochemical methods. Biomass gasification is the conversion of solid fuels like wood and agricultural residues into a combustible gas mixture. The gasification system basically consists of a gasifier unit, a purification system and energy converters- burner or engine. This book offers comprehensive coverage of the design and analysis of biomass gasification, the key technology enabling the production of biofuels from all viable sources like sugar beet and sweet sorghum. It aims at creating an understanding of the nature of biomass resources for energy and fuels, the variety of processes that are available for conversion of the wastes into energy or fuels. The book discusses the overview of the Biomass Energy along with their Properties, Composition, Benefits, Characteristics and Manufacturing Process of Biomass based products. Also it contains suppliers contact details of plant & machinery with their photographs. The content includes biomass renewable energy, prospective renewable resources for bio-based processes, biochemical from biomass, biomass based chemicals, biofuel production from biomass crops, biomass gasification, reuse of bio-genic iron oxides and woody biomass fly ash in cement based materials and agricultural areas, biofuel briquettes from biomass, biomass based activated carbon, environmental aspects. It will be a standard reference book for Professionals, Decision-makers, Engineers, those studying and researching in this important area and others interested in the field of biomass based products. Professionals in academia and industry will appreciate this comprehensive and practical reference book, due to its multidisciplinary nature.

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**[The Complete Book on Waste Treatment Technologies \(Industrial, Biomedical, Water, Electronic, Municipal, Household/ Kitchen, Farm Animal, Dairy, Poultry, Meat, Fish & Sea Food Industry Waste\)](#)**

**Author:** Prof. Dr. Mahendra Pal

**Format:** Paperback

**Book Code:** NI293

**Pages:** 592

**ISBN:** 9789381039670

**Price:** Rs. 1,675.00 US\$ 150.00

About the Book Waste management is a global problem that continues to increase with rapid industrialization, population growth, and economic development. As the world hurtles towards the urban future, the amount of Municipal Solid Waste (MSW) is growing very fast. Waste includes any solid material or material that is suspended dissolved or transported in water or deposited on land. Wastes are generally classified into solid, liquid, & gaseous and are broadly classified as household waste; municipal waste; commercial and non-hazardous industrial wastes; e- waste, hazardous (toxic) industrial wastes; construction and demolition waste; health care wastes – waste generated in health care facilities (e.g. hospitals, medical research facilities); human and animal wastes; and incinerator wastes. In the recent years, modern society has become more responsible when it comes to waste management. The fast industrialization, urbanization, modern technology, and rapidly growing population in India have posed a serious challenge to the waste management. In India, per capita generation rate of municipal solid waste ranges from 0.2 to 0.5 kg/day. At present, the daily generation rate in South Asia, East Asia and the Pacific combined is approximately 1.0 million tons per day. The current scenario reveals that there is a tremendous scope for the development of waste treatment technologies and is expected to offer significant opportunities in the near future.



Sustainability of waste management is the key for providing an effective service that can satisfy the need of end users. Solid Waste Management sector in India has become a very lucrative sector for investors. With a growing urgency for efficient waste management in many cities, there will be more and more employment opportunities in the sector. The participation of different sectors, roll of Government and private organization is important for better management of waste. This book describes the various waste treatment technologies like; Physical treatment techniques, biological treatment techniques, anaerobic lagoon techniques etc. It will be a standard reference book for professionals, entrepreneurs, students, teachers, researchers, administrators, and planners of various disciplines who are directly or indirectly involved in the waste management. &emsp; About the Author Dr. Mahendra Pal born on April 10, 1946 in Delhi, and obtained B. V. Sc. and A. H., M.V. P. H., Ph. D. and D. Sc. in 1969, 1975, 1981 and 1998, respectively. Prof. Pal worked at Massey University, Palmerstone, New Zealand (1984), Institute of Tropical Medicine, Antwerp, Belgium (1985-1986), and Tokyo University, Japan (1989-1990). Prof. Pal has acted as Advisor of over 68 students for D.V.M., M.Sc., and Ph.D. degree both in India, and Ethiopia. He has served in Veterinary and Medical institutes, and published over 475 papers in national and international journals. Prof. Pal has published many papers in collaboration with the scientists of Japan, New Zealand, South Korea, USA, Nepal and Ethiopia. He has authored seven books including "Zoonoses" and "Veterinary and Medical Mycology" which are highly appreciated by veterinary and medical scientists. Prof. Pal has developed sunflower seed medium (Pal's medium) in 1980, "PHOL" (Pal, Hasegawa, Ono, Lee) stain, in 1990, "Narayan" stain in 1998 and "APRM" medium in 2015, which are proved very useful for the study of fungi. Prof. Pal is credited to elucidate the etiologic significance of Cryptococcus neformans for the first time with mastitis of goat (1975) and buffalo (1980), Nocardia asteroides in corneal ulcer of cattle (1982), Apergillus fumigatus in keratitis of buffalo calf (1983), Candida tropicalis in human lung empyema (1987), Fusarium solani in corneal ulcer of buffalo (1992) and Trichophyton verrucosum in dermatitis of barking

deer (1993). Prof. Pal established for the first time the prevalence of *Cryptococcus neoformans* in the environment of New Zealand, Nepal, and Djibouti. He described for the first time the etiologic role of *Candida albicans*, and *Trichophyton verrucosum* in mastitis and dermatitis of camel, respectively in Ethiopia. Prof. Pal is serving as Honorary Member/Associate Editor of nine online journals. His papers are frequently cited as reference by many academicians in their papers, reviews, books, and monographs. Prof. Pal has started M.V.Sc. and Ph.D. in Veterinary Public Health at Veterinary College, Anand, India. He is also an instrumental to start Ph.D. in Veterinary Public Health at Addis Ababa University for the first time in Ethiopia. Prof. Pal is a recipient of several awards, including "Jawaharlal Nehru Award", "Distinguished Teacher Award", and "Life Time Achievement Award." Presently, he is working as Professor of Veterinary Public Health, Addis Ababa University, Ethiopia.

# Manufacture of Value Added Products from Rice Husk (Hull) and Rice Husk Ash (RHA)

**Author:** NPCS Board of Consultants & Engineers

**Format:** Paperback

**Book Code:** NI304

**Pages:** 208

**ISBN:** 9789381039809

**Price:** Rs. 1,295.00 US\$ 125.00



Manufacture of Value Added Products from Rice Husk (Hull) and Rice Husk Ash (RHA) (Precipitated Silica, Activated Carbon, Cement, Electricity, Ethanol, Hardboard, Oxalic Acid, Paper, Particle Board, Rice Husk Briquettes, Rice Husk Pellet, Silicon, Sodium Silicate Projects) Rice husk is the outermost layer of protection encasing a rice grain. Rice husk was largely considered a waste product that was often burned or dumped on landfills. Many ways are being thought for disposal of rice husk and only a small quantity of rice husk is used in agricultural field as a fertilizer, or as bedding and for stabilisation of soils. Therefore, the use of rice husk as rice husk ash is one of the most viable solution. The husk can be used for poultry farming, composting or burning. In the case of burning, it has been used as biomass to power reactors to generate thermal or electrical energy. India is a major rice producing country and the husk generated during milling is mostly used as a fuel in the boilers for processing paddy, producing energy through direct combustion and / or by gasification. The rice husk ash causes more environmental pollution and its disposal becomes a problem, hence requires attention regarding its disposal and its reuse. The ash is mainly composed of carbon and silica due to which it is used to manufacture different value added products. This book provides thorough information to utilize RHA with process pathway for economically valuable products. This handbook explains manufacturing process with flow diagrams of various value added products from rice husk & rice husk ash, photographs of plant & machinery with supplier's contact details and sample plant layout & process flow sheets. The major contents of the book are rice husk, rice husk ash RHA), precipitated silica from rice husk ash, activated carbon from rice husk, cement from rice husk ash, electricity from rice husk, ethanol from rice husk, hardboard from rice husk, oxalic acid from rice husk, paper from rice husk, particle board from rice husk, rice husk briquettes, rice husk pellet, silicon from rice husk, sodium silicate from rice husk, packaging. This book will be a mile stone for the entrepreneurs, existing units, professionals, libraries and others interested in recovery of value added products from rice husk (rice hull) & rice husk ash to explore an economic way for recycle and reuse of agricultural waste.

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## About NIIR

**NIIR PROJECT CONSULTANCY SERVICES (NPCS)** is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery,

Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

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