

# **Rice Cultivation and Processing Industry, Manufacturing of Value Added Products from Rice Husk (Hull) and Rice Husk Ash (RHA)**

[Wheat, Rice, Corn, Oat, Barley and Sorghum Processing Handbook  
\(Cereal Food Technology\)](#)

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

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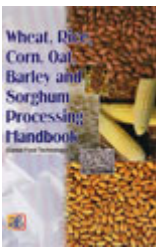
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Cereal grains play an important role in meeting the nutrient needs of the human population. Like any food, they are good to excellent sources of some nutrients and low or void in other nutrients. The vitamins content varies from one part of grain to another. The quality of cereal products is determined by a variety of characteristics which may be assigned different significance depending on the desired and use or type of product. Wheat, through the centuries, has been intimately associated with food uses for man. The usual conversion of wheat to a food product results in some proportion of kernel becoming an animal feed. The wheat milling industry produces bran, red dog, germ, and shorts and these secondary fractions amount to approximately 25% of the whole grain. Rice is one of the leading food crops of the world and is produced in all continents. It is generally considered to be a tropical crop; yields are higher in temperate areas than in the tropics. Rice is comparatively high in caloric value, N free extract, and rice protein has a fairly good balance of the essential amino acids. Rice variety is divided by grain size and shape into three types, known as short, medium and long grain rice. Historically and now through planned breeding, each grain type is associated with specific milling, cooking and processing characteristics. There are number of rice varieties of each grain type in commercial production and new ones are continually in the process of being developed and released. Barley is a crop with worldwide distribution; it is preeminent plant for the use in experimental genetic studies. Barley has a high degree of self fertilization, but is easily hybridized. Barley grain is rich in starch and sugars, relatively poor in protein and very low in fat. Corn kernels are flat seeds due to pressure during growth from adjacent kernels on the cob. They are botanically classified as a caryopsis (dry, indehiscent, single seeded fruit) and are attached to the cob by the pedicle. Corn and corn products are generally the most cost effective feeds or feed supplements available. Popcorn is undoubtedly the oldest snack food and has been consumed for centuries. The grasses known collectively as millets are a set of highly variable small seeded plant species indigenous to many areas of the world. Millets are of value especially in semiarid regions because of their short growing season and higher productivity under heat and drought conditions. Pearl millet is the most widely grown millet and is a very important crop in India. The common oat (*Avena sativa*) is a species of cereal grain grown for its seed, which is known by the same name (usually in the plural, unlike other grains). While oats are suitable for human consumption as oatmeal and rolled oats, one of the most common uses is as livestock feed. Oats make up a part of the daily diet of horses, about 20% of daily intake or smaller, and are regularly fed to cattle as well. Oats are also used in some brands of dog food and chickenfeed. Oat seeds are commonly marketed as cat grass to cat enthusiasts, since cats readily harvest and eat tender young oat, wheat, and some other grass sprouts. Sorghum is a genus of numerous species of grasses, one of which is raised for grain and many of which are used as fodder plants either cultivated or as part of pasture. The plants are cultivated in warmer climates worldwide. Maize, wheat and rice together accounted for 87% of all grain production worldwide, and 43% of all food calories, while the production of oats and rye have drastically fallen from their previous levels. Some of the fundamentals of the book are origin of wheat classification of wheat, endeavours to find industrial uses for wheat, criteria of wheat quality, botanical criteria of quality, milling principles, extraction rate and its effect on flour composition, grain structure as affecting grinding, definition of flour extraction stone milling:



yields of products, roller milling: flour extraction rates, rice production and utilization, origin of rice, comparison of rice with other cereal grains, composition of rice and cereal, breeding rice varieties with specific, industrial uses for rice and rice by products, caryopsis and composition of rice, gross structure of the rice caryopsis and its milling fractions etc. The present book contains processing of various cereals like wheat, rice, corn, oat, barley and sorghum with latest techniques. This is very useful book of entrepreneurs, agriculturists, researchers and professionals.

## [Handbook on Rice Cultivation and Processing](#)

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

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**Book Code:** NI200

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**Price:** Rs. 1,075.00 US\$ 125.00



Rice is the staple food of over half the world population. Rice is normally grown as an annual plant, although in tropical areas it can survive as a perennial crop and can produce a ratoon crop for up to 30 years. The rice plant can grow to 1 to 1.8 m tall, occasionally more depending on the variety and soil fertility. Since its origin, the spread of rice cultivation is extensive and rice is now being grown wherever water supply is adequate and ambient temperature are suitable. The rice grain is covered with a woody husk or hull, which is indigestible and is to be removed in the first step during processing for making the rice edible. Rice cultivation is well suited to countries and regions with low labor costs and high rainfall, as it is labor intensive to cultivate and requires ample water. Rice can be grown practically anywhere, even on a steep hill or mountain. The traditional method for cultivating rice is flooding the fields while, or after, setting the young seedlings. This simple method requires sound planning and servicing of the water damming and channeling, but reduces the growth of less robust weed and pest plants that have no submerged growth state, and deters vermin. While flooding is not mandatory for the cultivation of rice, all other methods of irrigation require higher effort in weed and pest control during growth periods and a different approach for fertilizing the soil. Drying is an essential step in the processing and preservation of paddy; it is the process that reduces grain moisture content to a safe level for storage. Milling is a crucial step in post production of rice. The basic objective of a rice milling system is to remove the husk and the bran layers, and produce an edible, white rice kernel that is sufficiently milled and free of impurities. India is the second largest rice producing country of the world after China. India also grows some of the finest quality aromatic rice of which basmati is the most high quality rice. This book basically deals with history, origin and antiquity of rice, seed rice and seed production, harvest and post harvest operations, water management practices for rice, diseases and pests of rice and their control, application of biotechnology in aromatic rice improvement, traditional methods of parboiling, modernization of parboiling process, solvent extractive rice milling, general types of quick cooking rice processes, dry milled rice products in brewing, breakfast cereals, rice flakes, puffed rice, rice in multi grain cereals etc. The present book contains cultivation and processing of rice in various ways. The book is very resourceful for the entrepreneurs, technocrats, research scholars etc.

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## [Emerging Investment Opportunity in Edible Oil Industry in India- Why to invest, Project Potential, Core Financials \(Refined Rice Bran Oil\), Business Prospects, Potential Buyers & Analysis](#)

**Author:** NPCS Team

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Indian edible oil sector has its feet firm in the ground as demand gets skewed towards the premium and healthy segment. The industry has seen a surge in demand for variants like olive oil and rice bran oil which are earmarked as 'healthy edible oils'. Indian population is getting more and more health conscious and has been non hesitant in paying a price for their health. NPCS recognizes the veiled business opportunity in this segment and has identified Rice Bran Oil Refining project as a promising investment option. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line. And before diversifying/venturing into any product, they wish to study the following aspects of the identified product: • Good Present/Future Demand • Export-Import Market Potential • Raw Material & Manpower Availability • Project Costs and Payback Period We at NPCS, through our reliable expertise in the project consultancy and market research field, have demystified the situation by putting forward business prospects of Rice Bran Oil Refining project through our report 'Emerging Investment Opportunity in Edible Oil Industry in India- Why to invest, Project Potential, Core Financials (Refined Rice Bran Oil), Business Prospects, Potential Buyers & Analysis'. Rice bran oil refining project satisfies all the above mentioned conditions and presents a valuable business opportunity. Through our report, we analyze the sector in various lights by covering aspects like product details, reasons for investing in the sector, potential buyers and cost and profitability of rice bran oil refining project. The report begins by discussing the overview of the Indian edible oil sector with its structure & classification and later identifies potential consumer group for the product. The factors that make a case for investing in the sector are profoundly elaborated in the report supported by graphical representation and forecasts of key data indicators. The report identifies growing population, urbanization, rising incomes, modern trade and health consciousness as key value drivers that will benefit the industry in the near future. The other sub sections talks about excise and customs duty on edible oils, contact details of the players operating in the segment and a forward looking statement for the sector. Moving to the very core of the report, project details segment includes vital information that is required while setting up a rice bran oil refining project. It provides product details like definition, characteristics and application, manufacturing process, raw materials required, list of machinery and key project financials. The project financial sub section provides details like plant capacity, costs involved in setting up of project, working capital requirements, payback period, projected revenue and profit. The industry has all the triggers in place to ensure a smooth ride in future. The favorable consumer dynamics of Indian market like rising disposable incomes, escalating population, urbanization and fast growing health consciousness among Indian population has kept the industry at high pedestrian. Reasons for buying the report: • This report helps you to identify a profitable project for investing or diversifying into by throwing light to crucial areas like industry size, market potential of the product and reasons for investing in the product • This report provides vital information on the product like its definition, characteristics and segmentation • This report helps you market and place the product correctly by identifying the target customer group of the product • This report helps you understand the viability of the project by disclosing details like machinery required, project costs and snapshot of other project financials • The report provides a glimpse of important taxes applicable on the industry • The report provides forecasts of key



parameters which helps to anticipate the industry performance and make sound business decisions Our Approach: • Our research reports broadly cover Indian markets, present analysis, outlook and forecast for a period of five years. • The market forecasts are developed on the basis of secondary research and are cross-validated through interactions with the industry players • We use reliable sources of information and databases. And information from such sources is processed by us and included in the report

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

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

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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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