Biofertilizer, Biofertiliser, Biogas, Organic Farming, Vermicompost, Vermiculture, Biotechnology

Bio Gas typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. Organic waste such as dead plant and animal material, animal dung, and kitchen waste can be converted into a gaseous fuel called Bio Gas. Bio Gas is basically a mixture of methane and carbon dioxide; it originates from biogenic material and is a type of bio fuel. It is a low cost form of energy derived from renewable waste resources: animal manures, agricultural residues, industrial wastewater, human waste and other organic materials. Bio Gas has been used widely as a source of energy and waste treatment, and as liquid fertiliser for soil enhancement, since long time. Digestion the underlying biological process of Bio Gas technology leads to a renewable energy service that ensures a distributed energy production, in which the energy is produced at the point of consumption or demand. A Bio Gas digester, which produces the Bio Gas, also provides an excellent agricultural waste management solution, most notably animal manures. Also, capturing methane generated in a Bio Gas digester has an immensely important role to play with respect to rural energisation, poverty alleviation and development, increased industrial and agricultural efficiency and competitiveness, and improved management of our greenhouse gas emissions. The major applications of Bio Gas are as fertilizer, fuel gas, methane production, mechanical and electrical power production, diesel engine operation, etc. Bio Gas technology is one of the fastest growing renewable energy sectors worldwide, with the annual market growth exceeding 30% each year. This book majorly deals with Bio Gas plants, raw materials for Bio Gas generation, utilization of Bio Gas and slurry, engineering design of Bio Gas units for developing countries, engineering aspects of small scale Bio Gas plants, a village scale Bio Gas pilot plant study using high rate digester technology, structural behaviour and stress conditions of fixed dome, simplified anaerobic digesters for animal waste, mechanical and electrical power from Bio Gas in developing countries, fuel gas production from organic wastes by low capital cost batch digestion, the toxicity effect of pesticides and herbicides on the anaerobic digestion process, the toxicity effect of pesticides and herbicides on the anaerobic digestion process, Bio Gas manure as a complete fertilizer, feasibility for Egyptian farmers etc. The book
contains technology of Bio Gas generation with its applications. This book will be an invaluable resource for researchers, consultants, entrepreneurs, institutional libraries, students etc.
Biofertilizers are seen as an important alternative technology, since the negative externalities of chemical fertilizers have become well known. The use of the latter has led to considerable environmental cost. Biofertilizers do not pollute the soil and do not disrupt the ecological balance, and hence are environment friendly. An increasing number of farmers are using biofertilizers, and the numbers of biofertilizer manufacturing units have also grown considerably. Organic farming system in India is not new and is being followed from ancient time. It is a method of farming system which primarily aimed at cultivating the land and raising crops in such a way, as to keep the soil alive and in good health by use of organic wastes (crop, animal and farm wastes, aquatic wastes) and other biological materials along with beneficial microbes (biofertilizers) to release nutrients to crops for increased sustainable production in an eco friendly pollution free environment. Organic farming has emerged as an important priority area globally in view of the growing demand for safe and healthy food and long term sustainability and concerns on environmental pollution associated with indiscriminate use of agrochemicals. Going organic may be a clear way of getting back to basics and getting away from the havoc chemicals can wreak on our health and our environment but the basics themselves may not be so clear. This book provides the view of immense potential of biofertilizers as a supplementary nutrient source for the crops and covers all major types of bacterial fertilizers. The major contents of this book is crop response to biofertilizers, nitrogen fixation, phosphate solubilising microorganisms, application and evaluation techniques, Bio Gas production, pest and disease management system in agriculture, production, promotion, quality control, marketing, future research planning, photographs and details of machineries, list of manufacturers and suppliers of biofertilizers and organic farming in directory section. This book will be of use and interest to consultants, researchers, libraries, entrepreneurs, manufacturers of biofertilizer and for those who wants to venture in to this field.
Advantage of vermicomposting is that it composes the wastes of rural areas. They clean our villages by using unnecessary organic and non-organic materials. Improves the texture of the soil and its ability to store water. Improves root growth and the multiplication of beneficial soil microorganisms by providing optimum aeration to the soil. Vermicompost (vermi-compost) is a mixture of decomposing vegetable or food waste, bedding materials, and vermicast created by the decomposition process using various species of worms, usually red wigglers, white worms, and other earthworms. This is known as vermicomposting, and the practice of raising worms for this purpose is known as vermiculture. Sewage treatment can also be done with vermicomposting. The Global Vermicompost Market is reaching growing at a CAGR of 16.74%. The Growth of the global vermicompost market is caused by various factors, such as improved soil aeration, improved water holding capacity, better nutrient cycle, and enriched soil with micro-organism, helps in plant root growth and structure, enhanced germination. The vermicomposting method is used in organic farming. Increasing the use of sustainable agricultural practices, such as vermicomposting along with Government support for organic farming is significantly contributing to the global vermicompost market growth. Vermicompost offers plants with necessary nutrients and helps in plant diseases suppression. Worm castings often comprise 7 times more phosphorus, 11 times more potassium, and 5 times more nitrogen than ordinary soil, which are crucial minerals required for plant growth. Vermiculture and Vermicompost (Earthworm), as well as their manufacturing methods, are all covered in depth in this book. It also offers photos of equipment as well as contact information for industrial providers. This book is a one-stop shop for everything you need to know about the Vermiculture and Vermicompost (Earthworm) industry, which is ripe for manufacturers, merchants, and entrepreneurs. This is the only book that goes into great detail about Vermiculture and Vermicompost. It's a genuine feast of how-to material, from concept to equipment buying.

Biopesticides Handbook
Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Agricultural pesticides, properly used, are essential in supplying the food requirements of the world ever growing population. The use of synthetic pesticides affects the health of human being. The indiscriminate use of pesticides has adversely affected the health of the soil. The residual pesticides in the soil not only affect the soil quality but also the water quality, as they get leached into the ground water. Due to these reasons, role of biopesticides are very important for sustainable agriculture. The use of biopesticides for sustainable agriculture is a complex issue that at times is difficult to comprehend and plan. Biopesticides are usually inherently less toxic than conventional pesticides. They generally affect only the target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides that may affect organisms as different as birds, insects, and mammals. They often are effective in very small quantities and often decompose quickly, thereby resulting in lower exposures and largely avoiding the pollution problems caused by conventional pesticides. Biopesticides, key components of integrated pest management (IPM) programmes, are receiving much practical attention as a means to reduce the load of synthetic chemical products being used to control plant diseases. In most cropping systems, biological pesticides should not necessarily be viewed as wholesale replacements for chemical control of plant pests and diseases, but rather as a growing category of efficacious supplements that can be used as rotation agents to retard the onset of resistance to chemical pesticides and improve sustainability. In organic cropping systems, biopesticides can represent valuable tools that further supplement the rich collection of cultural practices that ensure against crop loss to diseases. Some of the examples of biopesticides are triazino benzimidazol, thiophene sar, pyrazoles, hydroxyacetophenones, benzoylphenylureas, thiadiazolo S triazine etc. It is observed that India occupies a comparatively better position in the arena of biopesticides; in terms of growth of usage, percentage share of the total pesticide market and also in research publications. The driving forces behind this progress are identified as huge research infrastructure (universities and bio control labs) and favourable public support system/policies. Subsequently, it delves on strategies to incorporate the promotion of biopesticides into rural development efforts like
recognition of the huge traditional knowledge base and use of biopesticides developed using indigenous technologies. Some of the fundamentals of the book are synthesis of triazino benzimidazol as biopesticides, synthesis and pesticidal activities of thiadiazolo S triazine and imidazol, synthesis and antimicrobial activities of pyrazoles, effects of penconazole on plasma membrane, metabolism of diclofop methyl, bleaching herbicides stimulate maize HMGR activity, soil transformation of acetochlor, propanil degrading amidase activity, inhibition of BTX B binding by RH 3421, KDR type resistance in German cockroach etc. This is the first book of its kind which provides different parameters about biopesticides. The book will not only be resourceful for new entrepreneurs but will also help the technocrats, research scholars and those who willing to know more about biopesticides.
Organic farming, composed of organic fertilizers as an integral virtue, continues to remain a lucrative bet for the expanding agricultural industry, in line with growing organic food appeal to consumers as a healthy and ethical choice.

Manufacture of Biofertilizer and Organic Farming
With the introduction of green revolution technologies, the modern agriculture is getting more and more dependent upon the steady supply of synthetic inputs. Intensive agriculture with the use of chemical fertilizers in large amount has, no doubt, resulted in manifold increase in the productivity of farm commodities but the adverse effect of these chemicals are clearly visible on soil structure, micro flora, quality of water, food and fodder. At this critical juncture, biofertilizers are useful supplement to chemical fertilizers. Organic farming has emerged as the only answer to bring sustainability to agriculture and environment. Biofertilizers is also an ideal for practicing organic farming. Biofertilizers are the most advanced biotechnology necessary to support developing organic Agriculture, sustainable agriculture, green agriculture and non-pollution agriculture. Bio Fertilizer are natural and organic fertilizer that helps to keep in the soil with all the nutrients and live microorganisms required for the benefits of the plants. Today product like biofertilizers using the biotechnology techniques have proved that biological control is widely regarded as a desirable technique for controlling insects and pests, due to its minimal environmental impact and its avoidance of problems of resistance in the vectors and agricultural pests. The increasing demand for biofertilizers and the awareness among farmers and planters in the use of biofertilizers have paved way for the fertilizer manufacturers and new entrepreneurs to get into biofertilizers production. It is one of the important components of integrated nutrient management, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. This book gives a detailed process on manufacture of biofertilizers & organic farming. It contains chapters on biofertilizers, role of biofertilizer in crop production, production and distribution of biofertilizer, organic farming, method of organic farming, weed and pest management, and many more. This book will be very helpful to soil scientists, microbiologists, biologists, students, new entrepreneurs, fertilizer industry, organization engaged in biofertilizers production, training centres and to all those interested in the efficient use and recycling of wastes, resource management and sustainable farming.
Organic agriculture has grown out of the conscious efforts by inspired people to create the best possible relationship between the earth and men. After almost a century of neglect, organic agriculture is now finding place in the mainstream of development and shows great promise commercially, socially and environmentally. Integrated organic farming is a commonly and broadly used word to explain a more integrated approach to farming as compared to existing monoculture approaches. It refers to agricultural systems that integrate livestock and crop production and may sometimes be known as Integrated Bio systems. It denotes a holistic system of farming which optimizes productivity in a sustainable manner through creation of interdependent agri-eco systems where annual crop plants (e.g. wheat), perennial trees (e.g. horticulture) and animals (including fishes where relevant) are integrated on a given field or property. This concept of organic farming is based on following principles: 1. Nature is the best role model for farming, since it does not use any inputs nor demand unreasonable quantities of water. 2. The entire system is based on intimate understanding of nature’s ways of replenishment. The system does not believe in mining of the soil of its nutrients and do not degrade it in any way. 3. The soil in this system is considered as a living entity. 4. The soil’s living population of microbes and other organisms are significant contributors to its fertility on a sustained basis and must be protected and nurtured, at all cost. 5. The total environment of the soil, from soil structure to soil cover is more important and must be preserved. Integrated Organic farming is a method of farming system, which primarily aims at cultivating the land and raising crops in such a way, so as to keep the soil alive and in good health. It is the use of organic wastes (crop, animal and farm wastes, aquatic wastes) and other biological materials, mostly produced insitu- along with beneficial microbes (bio fertilizers) to release nutrients to crops, which connotes the ‘organic’ nature of organic farming. It is also termed as organic agriculture. In the Indian context it is also termed as ‘Javik Krishi’. We have compiled all the relevant information regarding integrated organic farming in this book. This is first book of its kind which contains reliable details related to organic farming, green manuring, biological nitrogen fixation,
uses of vermiculture bio-tech, organic fertilizers for flooded rice ecosystem, biological pest management, press mud as plant growth promoters, bio fertilizer for multipurpose tree species, rice- fish integration, response of crops to organic fertilizer and many more. The book is very useful for farmers, agriculture, universities, consultants and research scholars.
The Complete Book on Biological Waste Treatment and their Utilization

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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.
India is an agro based country. So organic farming plays an important role in agro field. The popularity of organic farming is gradually increasing and now organic agriculture is practiced in almost all countries of the world, and its share of agricultural land and farms is growing. As the organic food market continues to expand, so do the opportunities for small farmers. Organic farming has emerged as the only answer to bring sustainability to agriculture and environment. This handbook is a comprehensive guide to growing, certifying, and marketing organic produce. Organic farming is not only a philosophy, but also a well-researched science that combines soil fertility, plant pathology and other biological and environmental sciences. The major contents of this book are Sustainable Agriculture, National Programme on organic farming, Integration with organics and biofertilizers, Bulky organic manures and crop residues, Manuring on sight, Manuring potentials, Green Manuring, Production and promotion of organic fertilizers, Vermi composting, Response of crops to organic fertilizers, Phosphate solubilizing, Bacillus thuringiensis, Crop residue management, Integrated nutrient management towards sustainable agriculture, Integrated farming system, Mechanism of nitrogen fixation, Economics and marketing of organic farming. As we have seen, the booming development taking place in organic farming and marketing offers many opportunities. We will be able to go on contributing to the establishment of organic production systems and this could lead to changes in life style and consumption patterns that will reach far beyond food and nutrition. This book will be very helpful to soil scientists, microbiologists, biologists, students, new entrepreneurs, fertilizer industries, training centers and to all those interested in efficient use and sustainable farming.
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