

# **The Complete Technology Book on Biofertilizer and Organic Farming (Potash, Greenhouse Farming, Hydroponic Farming, Pellet Fertilizer, Seaweed Fertilizer, Biogas with Manufacturing Process, Machinery Equipment Details) 3rd Edition**

**Author:** Dr. Himadri Panda

**Format:** Paperback

**ISBN:** 9789381039076

**Code:** NI115

**Pages:** 480

**Price:** Rs. 1,895.00 US\$ 48.00

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Organic fertilisers derived from natural sources such as plants, animals, and microorganisms are known as biofertilizers. They are high in nutrients such as nitrogen, phosphorus, and potassium. Biofertilizers are environmentally friendly, long-lasting, and less expensive than synthetic fertilisers. Biofertilizers can be applied directly to the soil to improve fertility and crop yield. They are also used in conjunction with other organic farming practises to improve soil health, such as composting and mulching. Biofertilizers contribute to a reduction in the use of chemical fertilisers, which can pollute water sources and harm the environment. Biofertilizers improve crop quality by increasing nutrient content and improving taste, in addition to their environmental benefits. They also improve plant resistance to diseases and pests. Organic farming is a subset of agriculture that emphasizes natural methods such as composting, crop rotation, and the use of organic fertilisers and pest control. Organic farmers grow their crops without the use of synthetic fertilisers, pesticides, or genetic engineering. Instead, they rely on naturally occurring nutrients in the soil and organic matter, such as compost and manure, to provide essential nutrients and minerals to their plants. Organic farmers also use traditional farming methods that promote biodiversity, soil fertility, and water conservation. Organic farming focuses on producing food in an environmentally friendly manner while also respecting animals and nature.

The global biofertilizers market is expected to grow at a CAGR of 12.04% during the forecast, from \$2.02 billion to \$4.47 billion. Organic farming is one of the fastest-growing agricultural methods in the world, with 72.3 million hectares of agricultural land under organic agriculture management globally, according to the Research Institute of Organic Agriculture. The use of synthetic fertilisers contaminated the soil and killed microorganisms. Organic farming is rapidly becoming popular in order to reduce soil pollution. Organic agriculture makes the best use of local resources to improve soil fertility while avoiding agrochemicals, GMOs, and many synthetic compounds used as food additives. The growing demand for organic food motivates farmers to use bio-based fertilisers that are compatible with organic food production. Higher product appreciation and adoption among farmers in developing and developed economies are expected to positively influence the growth of the Biofertilizers Market in the coming years. Furthermore, agricultural

producers' active participation in ramping up their biological agriculture, such as bio-origin fertilisers, is expected to boost the growth of the Biofertilizers Market in the coming years. Furthermore, the rise in food product demand and per capita income has created enormous opportunities for the growth of the Biofertilizers Market in various regions and countries around the world.

The book's main contents are Biofertilizer, Organic Farming, Potash, Greenhouse Farming, Hydroponic Farming, Pellet Fertilizer, Seaweed Fertilizer, Biogas, Anaerobic Digesters, Biopesticides, and Organic Manure. The Manufacturing Process, Machinery Equipment Details, and Photographs with Suppliers Contact Details are also given.

A total guide to manufacturing and entrepreneurial success in today's most demandable Biofertilizer and Organic Farming industry. This book is one-stop guide to one of the fastest growing sectors of the Biofertilizer and Organic Farming industry, where opportunities abound for manufacturers, retailers, and entrepreneurs. This is the only complete handbook on the commercial production of Biofertilizer. It serves up a feast of how-to information, from concept to purchasing equipment.

## Contents

### 1. INTRODUCTION

- 1.1 Role
- 1.2. The reason for using biofertilizers
- 1.3. Benefits
- 1.4. Types
  - 1.4.1. Rhizobium
  - 1.4.2. Azotobacter
  - 1.4.3. Azospirillum
  - 1.4.4. Azolla
  - 1.4.5. Plant growth-promoting rhizobacteria (PGPR)
  - 1.4.6. Potassium Mobilizing Biofertilizer (KMB)
  - 1.4.7. Zinc Solubilizing Biofertilizer (ZSB)
  - 1.4.8. Phosphate Absorbers Mycorrhizaeaeaeae
- 1.5. Components
  - 1.5.1. Symbiotic nit rogen-fixing bacteria
  - 1.5.2. Symbiotic nit rogen-fixing Cyanobacteria
  - 1.5.3. Free-living nitrogen-fixing bacteria
  - 1.5.4. Other Components of biofertilizers
- 1.6. Compost Biofertilizers
- 1.7. Methods

### 2. HOW TO START A BIOFERTILIZER BUSINESS

- 2.1. Plan
- 2.2. The growth potential of the Biofertilizer business
- 2.3. Different types of fertilizers to start your fertilizer business
  - 2.3.1. Organic fertilizer
  - 2.3.2. Chemical fertilizer
  - 2.3.3. Biofertilizer business: Things to consider
- 2.4. Starting a Biofertilizer business in India: A step-by-step guide
  - 2.4.1. Creating a business plan
  - 2.4.2. A suitable location must be selected and leased
  - 2.4.3. Business permit, licence, and legal documents required for organic fertilizers
  - 2.4.4. Supply Expertise
  - 2.4.5. Organize the laboratory and manufacturing facility in the house

- 2.4.6. Machines & Equipment
- 2.4.7. Refrigerator
- 3. TYPES OF BIOFERTILIZERS
- 3.1. Types of Biofertilizers
- 3.1.1. Bio NPK
- 3.1.2. Acetobacter
- 3.1.3. Azospirillum
- 3.1.4. Mycorrhiza
- 3.1.5. Phosphate Solubilizing Bacteria
- 3.1.6. Potassium Solubilizing Bacteria
- 3.2. Biofertilizer Applications
- 3.3. What is the purpose of using biofertilizers?
- 3.3.1. Advantages
- 4. BIOFERTILIZER PRODUCTION METHOD AND PROCESS
- 4.1. Purpose
- 4.2. Production
- 4.2.1. Strain Choice
- 4.2.2. Plant Pelletizing
- 4.2.3. Vaccinant Transporters
- 4.3. Quality Standards for Inoculants
- 4.4. Packaging
- 4.5. Storage
- 4.6. Immunization of the Field
- 4.7. Preparation
- 4.8. Production Line from Animal Wastes
- 4.9. Cow Dung Fertilizer Machine
- 4.10. Dry Cow Dung Fertilizer by Using Fertilizer Machines
- 4.11. Types of Cow Dung Fertilizer Machines Use for Composting
- 4.12. Compost Windrow Turner for Cow Manure Composting
- 4.13. Manure Making Machine
- 4.14. Crop Growth
- 4.15. Aims of Production
- 4.16. Rotary Cooler
- 4.17. Cooling Fertilizer Pellets
- 4.18. Fertilizer Dryer
- 4.19. What Drying Technology Does The Fertilizer Dryer Use?
- 4.20. Smart Rotary Drum Dryer
- 4.21. Drum Dryer
- 4.22. Fertilizer Packing Machine
- 4.23. Powdery Fertilisers Packing Facility
- 4.24. Package Organic Fertilisers
- 4.25. Fertilizer Mixer for Blending Plant
- 4.26. Hot selling double shafts horizontal cow dung mixer fertiliser equipment
- 4.27. Tiny Chicken Manure Fertiliser Mixer
- 4.28. Pan Mixer Machine
- 4.29. BB Fertilizer Blending Equipment for Mixed Fertilizer Granules Processing
- 4.30. Batch Mix Plant
- 4.31. Fertilizer Crusher
- 4.32. Vertical Crushing
- 4.33. Chain Crusher
- 4.34. Hammer Mill Crushing
- 4.35. Hot Semi-Wet Crusher
- 4.36. Cage Crush Machine

- 4.37. Small Straw Grinders
- 4.38. Urea Fertilizer Powder Grinding Machine
- 4.39. High-Quality Materials for Smoother Operation
- 4.40. Organic Fertilizer Granulator
- 4.41. Uses of Organic Fertilizer Granulator
- 4.42. Raw Materials
- 4.43. Organic Fertilizer Using Chicken Manure
- 4.44. Organic Fertilizer from Food Waste
- 4.45. Amino Acid Organic Fertilizer
- 4.46. Setup an Organic Fertilizer Manufacturing Unit
- 4.47. Compost Machine
- 4.48. Use
  - 4.48.1. Windrow & Trench
- 4.49. Hydraulic Organic Waste Crawler
- 4.50. Forklift Type Manure Compost Turner Machine
- 4.51. Cow Dung Compost Windrow Turner
- 4.52. Poultry Waste Compost Fertilizer Machine
- 4.53. Chain Plate Type Compost Fertilizer Making Machine
- 5. SIMPLIFIED ANAEROBIC DIGESTERS FOR BIOFERTILIZER
- 5.1. Abstract
- 5.2. Foreword
- 5.3. Batch Digester Plant
- 5.4. Plug Flow Digester Plant
- 5.5. Covered Lagoon Biogas System
- 5.6. Continuous Expansion Digester
- 5.7. Tests on a Small Electric Generator set Fuelled by Biogas
- 5.8. An Economic Evaluation of the Plants
- 5.9. Conclusions
- 6. OPERATING CONDITIONS FOR ANAEROBIC DIGESTION OF BIOFERTILIZER
- 6.1. Abstract
- 6.2. Introduction
- 6.3. Design of the Experiment
- 6.4. Results and Discussion
  - 6.4.1. Effect of the initial total solids (TS) concentration on
  - 6.4.2. Effect of hydraulic retention time (θ) on
  - 6.4.3. Effect of temperature on
  - 6.4.4. Effect of mode of operation on
- 7. POTASH PRODUCTION PROCESS
- 7.1. Comminution
- 7.2. Potash Flotation Process
- 7.3. Common Salt or Halite: NaCl
- 7.4. Crushing Section
- 7.5. Scrubbing and Desliming
- 7.6. Grinding and Classification
- 7.7. Conditioning
- 7.8. Potash Flotation
- 7.9. Thickening, Filtering and Brine Recovery
- 7.10. Pumping of Products
- 8. APPLICATION AND EVALUATION TECHNIQUES
- 8.1. Different Methods for Biofertilizer Inoculation
  - 8.1.2. Seed inoculation
- 8.2. Top dressing of Biofertilizers
  - 8.2.1. Granular biofertilizers

- 8.2.2. Solarisation of FYM/Compost
- 8.2.3. Granular biofertilizer mixed with seed
- 8.2.4. Broadcasting of granular biofertilizers
- 8.2.5. Frequency of inoculation
- 8.2.6. Liquid inoculation of Biofertilizers
- 8.3. Methods of application of liquid inoculation
  - 8.3.1. Drenching by Sprayers
  - 8.3.2. Application in root zone
  - 8.3.3. Culture pellet
- 8.4. Methods of Application of Other Biofertilizers
  - 8.4.1. Blue Green Algae
  - 8.4.2. Azolla
  - 8.4.3. As green manuring
  - 8.4.4. Azolla dual cropping
- 8.5. Azotobacter
  - 8.5.1. Preparation and use of Azotobacter inoculant
  - 8.5.2. Application
- 8.6. Azospirillum
- 8.7. Mycorrhizae
  - 8.7.1. Endomycorrhizae
  - 8.7.2. Ectomycorrhizae
- 8.8. Foliar Biofertilizer
- 8.9. Humar
- 8.10. Humic Acid
  - 8.10.1. Intorduction
  - 8.10.2. Application
  - 8.10.3. Soil
  - 8.10.4. Foliar
  - 8.10.5. Seed treatment
  - 8.10.6. Soil Benefit
  - 8.10.7. Root
  - 8.10.8. Seeds
  - 8.10.9. Plants
  - 8.10.10. Precautions
- 8.11. Different Media Used to Study Biofertilizer
  - 8.11.1. Growth Media for Rhizobium
- 8.12. Media for Testing Nodulating Ability of Rhizobium
  - 8.12.1. Isolation of Frankia
- 8.13. Media Used
- 8.14. Precautions in handling
- 9. CROP RESPONSE TO BIOFERTILIZERS
  - 9.1. Symbiotic Nitrogen Fixation
    - 9.1.1. Rhizobium
  - 9.2. Azolla
  - 9.3. Nonsymbiotic Nitrogen Fixation
    - 9.3.1. Blue Green Algae (BGA)
  - 9.4. Azotobacter
  - 9.5. Azospirillum
  - 9.6. Phosphate Solubilizers and Fixers
    - 9.6.1. Mycorrhiza
  - 9.7. Phosphate Solubilizing Microorganisms
  - 9.8. Factors Affecting Crop Response to Biofertilizers
  - 9.9. Host Response to Biofertilizers

- 9.10. Interaction of Inoculants with other Nutrients
- 9.11. Multi-Microbial Inoculation
- 9.12. Compatability Between Biofertilizers and Chemical Fertilizers
- 9.13. Adaptive Trials
- 10. BIOGAS PRODUCTION FROM ORGANIC BIOFERTILIZER
- 10.1. Abstract
- 10.2. Introduction
- 10.3. Materials and Methods
- 10.3.1. Organic Wastes
- 10.3.1. Starter 166
- 10.3.2 Analytical procedures
- 10.4. Experimental
- 10.5. Results and Discussion
- 10.6. Biogas Production from Geranium Flour (GF)
- 10.6.1. Biogas Production from Akalona (AK)
- 10.6.2. Biogas Production from Watermelon Residue (WR)
- 11. BIOGAS FROM LIQUID BIOFERTILIZER DERIVED FROM BANANA AND COFFEE PROCESSING
- 11.1. Abstract
- 11.2. Introduction
- 11.3. Results
- 12. STEPS FOR HOW TO START ORGANIC FARMING
- 13. ORGANIC FARMING
- 13.1. Pollution Problems with Fertilizers
- 13.1.1. Water Pollution
- 13.1.2. Atmospheric pollution
- 13.1.3. Damage to crops and soils
- 13.1.4. Heavy Metal Contamination
- 13.2. Environment Restoration with Fertiliser
- 13.3. Pollution Abatement Startegies
- 13.4. Organic Farming
- 13.5. Why Organic Farming
- 13.6. Basic Concepts of Organic Farming
- 13.6.1. Integrated Plant Nutrient Supply Management (IPNSM)
- 13.6.2. Intergrated Insect Pest and Disease Management
- 13.6.3. Integrated Soil and Water Management
- 13.7. Alternatives
- 13.8. Organic Manures
- 13.9. Plant Origin Pesticides
- 13.10. Biopesticides
- 13.11. Bioherbicides
- 13.12. Biofertilizers
- 13.12.1. Microorganisms as nutrient regulators
- 13.12.2. Organic Matter in Agroecosystem
- 13.12.3. Soil Microbial biomass
- 13.12.4. Nutrient Availability
- 13.12.5. Losses
- 13.13. Cultural Practies
- 14. METHODS AND TYPES OF ORGANIC FARMING
- 14.1. A Step-By-Step Manual for Organic Agricultural Techniques
- 14.2. Characteristics
- 14.3. Goals of Switching to Organic Farming
- 14.4. Different Methods of Organic Farming

- 14.4.1. Crop Diversity
- 14.4.2. Crop Rotation
- 14.4.3. Biological Pest Control
- 14.4.4. Soil Management
- 14.4.5. Green Manure
- 14.4.6. Compost
- 14.4.7. Weed Management
- 14.4.8. Controlling Other Organisms
- 14.4.9. Livestock
- 14.4.10. Genetic Modification
- 15. ORGANIC MANURES
- 15.1. Organic Matter
  - 15.1.1. Chemical nature of organic matter
- 15.2. Organic Manures
  - 15.2.1. Organic residues
  - 15.2.2. Cow dung manure
  - 15.2.3. Live stock wastes
- 15.3. Green Manure
  - 15.3.1. Importance of green manure
  - 15.3.2. Green manure crops
  - 15.3.3. Turning of green manure crops
  - 15.3.4. Biological control of plant disease and green manure
  - 15.3.5. Fate of green manures
  - 15.3.6. Nutrient status
  - 15.3.7. Compost
  - 15.3.8. Sources
  - 15.3.9. Methods
  - 15.3.10. Indore method
  - 15.3.11. Bangalore Method
  - 15.3.12. NADEP Method
  - 15.3.13. Role of microbes in Compost making
- 15.4. Vermicompost
  - 15.4.1. Vermi composting
- 15.5. Phospho-Compost
- 15.6. Oil Cakes
  - 15.6.1. Poultry waste compost
- 15.7. Organic Industrial Wastes
- 15.8. Materials
  - 15.8.1. Flyash
  - 15.8.2. Coir pith
  - 15.8.3. Pressmud
  - 15.8.4. Phosphogypsum
  - 15.8.5. Sewage and sewage sludge
  - 15.8.6. Sugar factory waste and sugarcane trash
- 15.9. Biomethanation
- 15.10. Constraints
- 16. BIOPESTICIDES
- 16.1. Discovery
- 16.2. Development
- 16.3. Registration
- 16.4. Biological Control of Insect
  - 16.4.1. Fungal Insecticides
  - 16.4.2. Bacterial Insecticides

- 16.4.3. *Bacillus thuringiensis* (BT)
- 16.4.4. Mode of action
- 16.4.5. The question of resistance
- 16.4.6. Commercial Prospects
- 16.4.7. Improvements in BT through genetic engineering
- 16.4.8. The BT protein and the efforts on recombinant DNA in this area
- 16.4.9. Limitations of BT
- 16.4.10. Safety
- 16.4.11. Viral Insecticides
- 16.4.12. Nuclear Polyhedrosis Virus
- 16.4.13. Protozoan Insecticides
- 16.4.14. Possibilities of field application
- 16.5. Botanical Pesticides
- 16.5.1. Pheromone trap
- 16.5.2. Trichocards
- 16.6. Biological control of plant diseases
- 16.6.1. Soilborne diseases
- 16.6.2. Methods for biocontrol
- 16.6.3. Biological Seed Treatment
- 16.7. Foliar Diseases
- 16.7.1. Introduction
- 16.7.2. Selection of biocontrol agents
- 16.7.3. Formulation and delivery system
- 16.7.4. Improved efficacy
- 16.7.5. Commercialization
- 16.8. Nematodes as Biological Control Agents
- 16.8.1. Production and Formulation
- 16.9. Biological Control of Nematodes
- 16.10. Biological Control of Weeds
- 16.11. Role of Genetic Engineering
- 17. SUSTAINABLE AGRICULTURE
- 17.1. Definition
- 17.2. Dimensions
- 17.2.1. Perceptions
- 17.3. Components
- 17.3.1. Crop Diversification
- 17.3.2. Crop Rotation
- 17.3.3. Biological Nitrogen Fixation
- 17.3.4. Mixed Cropping
- 17.3.5. Soil Microbes on Crops
- 17.3.6. Genetic Diversity
- 17.3.7. Integrated Nutrient Management (INM)
- 17.3.8. Integrated Pest Management (IPM)
- 17.3.9. Sustainable Water Management
- 17.3.10. Post Harvest Technology
- 17.3.11. Extension Programmes
- 17.3.12. Sustainable Agriculture for India
- 17.3.13. Role of biotechnology
- 17.3.14. Government support to farmers
- 17.4. Conclusion
- 18. GREENHOUSE CULTIVATION
- 18.1. Designs and classification of greenhouse
- 18.2. Classifications



- 18.3. Poly House
- 18.4. Shade House
- 18.5. Orientation of greenhouse / polyhouse
  - 18.5.1. Design
  - 18.5.2. Orientation
  - 18.5.3. Wind Effects
  - 18.5.4. Size of the greenhouse
  - 18.5.5. Spacing between greenhouses
  - 18.5.6. Height of greenhouse
  - 18.5.7. Structural Design
  - 18.5.8. Components
  - 18.5.9. Cladding Material
  - 18.5.10. Plant Growing Structures
  - 18.5.11. Environmental Factors Influencing Greenhouse Cultivation
  - 18.5.12. Natural Ventilation
- 18.6. Heating of greenhouse
  - 18.6.1. Heating Systems
  - 18.6.2. Boiler
  - 18.6.3. Unit Heaters
  - 18.6.4. Infra-Red Heaters
  - 18.6.5. Solar Heating
- 18.7. Environmental Control
  - 18.7.1. Temperature Control
  - 18.7.2. Relative Humidity Control
  - 18.7.3. Light Intensity Control
  - 18.7.4. Quality of Light
- 18.8. Fan and Pad
  - 18.8.1. Selection of Fan
- 18.9. Media Preparation and Fumigation
  - 18.9.1. Getting the media ready for greenhouse production
  - 18.9.2. Gravel Culture
  - 18.9.3. Media Ingredients and Mix
  - 18.9.4. Pasteurization of Greenhouse Plant Growing Media
  - 18.9.5. Fungicides and their effect on a few fungi
  - 18.9.6. Temperature necessary to kill soil pests
- 18.10. Fumigation in Greenhouse
- 18.11. Drip Irrigation and Fertigation Systems in Greenhouse Cultivation
  - 18.11.1. Watering System
  - 18.11.2. Fertigation System
  - 18.11.3. Fertilizers
- 18.12. Forms of Inorganic Fertilizers
  - 18.12.1. Slow Release Fertilizer
  - 18.12.3. Liquid Fertilizer
- 18.13. Fertilizer Application Methods
  - 18.13.1. Constant Feed
  - 18.13.2. Intermittent Application
- 18.14. Fertilizer Injectors
  - 18.14.1. Multiple Injectors
  - 18.14.2. Fertilizer Injectors
- 18.15. General Fertigation Issues
- 18.16. Problem-Solving
- 18.17. Inadequacies in fertilizers
- 18.18. Aluminum Surplus

- 18.19. Corrective Actions for Excessive Fertiliser
- 18.20. Harm Caused by Poisonous Gases
- 18.21. Unique Horticulture Techniques
- 18.22. Postharvest Handling Practices for Important Cut Flowers
- 19. GREENHOUSE FARMING
- 19.1. Introduction
- 19.2. The various greenhouse kinds
- 19.3. Advantages
- 19.4. Types
- 19.4.1. Greenhouse Conventional Freestanding
- 19.4.2. Hoop House/High Tunnel
- 19.4.3. Greenhouse Lean-to or Attached
- 19.4.4. Cold Frames/Cold House
- 19.5. Advantages of Greenhouse Agriculture
- 19.6. Plants That Can Grow in a Greenhouse
- 19.6.1. Sweet Corn
- 19.6.2. Cucumbers
- 19.6.3. Baby Carrots
- 19.6.4. Pumpkins
- 19.6.5. Spinach
- 19.6.6. Tomatoes
- 19.6.7. Herbs
- 19.6.8. Garlic
- 19.6.9. String beans
- 19.6.10. Squash
- 20. GREENHOUSES CONSTRUCTION
- 20.1. Earthmoving and Level Surface
- 20.2. Set Out and Preparation of the Foundation
- 20.3. Reception of Materials. Preassembly at Work
- 20.4. Assembly of the Greenhouse
- 21. HOW TO START A HYDROPONIC FARM BUSINESS
- 21.1. Step 1: Create a Business Plan
- 21.1.1. What recurring costs are there for a hydroponic agricultural operation?
- 21.1.2. Who is the intended audience?
- 21.1.3. How can a hydroponic farm operation generate revenue?
- 21.1.4. How much can charge customers?
- 21.1.5. How much money can a hydroponic farm operation bring in?
- 21.1.6. How can increase the profitability of company?
- 21.1.7. What will the name of company be?
- 21.2. Step 2: Form a Legal Entity
- 21.3. Step 3: Register for Taxes
- 21.3.1. Taxes for small businesses
- 21.4. Step 4: Open a Business Bank Account & Credit Card
- 21.5. Step 5: Set Up Business Accounting
- 21.6. Step 6: Obtain Necessary Permits and Licenses
- 21.6.1. Requirements for Federal Business Licenses
- 21.6.2. Requirements for State and Local Business Licensing
- 21.6.3. The Occupancy Permit
- 21.6.4. Food Regulations
- 21.7. Step 7: Get Business Insurance
- 21.8. Step 8: Define Brand
- 21.8.1. How to market and advertise a hydroponic farm operation
- 21.8.2. How to get new clients?

- 21.9. Step 9: Create Business Website
- 21.10. Step 10: Set Up Business Phone System
- 22. HYDROPONIC FARMING
  - 22.1. Benefits
  - 22.2. Similarity with Greenhouse Gardening
  - 22.3. Advantages
  - 22.4. Types
    - 22.4.1. Aerated Nutrient Standing Solution
    - 22.4.2. Outer Structure
    - 22.4.3. Growing Method
    - 22.4.4. System for Regulating Irrigation and Temperature
    - 22.4.5. Hydroponic Equipment Installation
    - 22.4.6. Provide Instruction for Mastering the Hydroponic Technique
  - 22.5. A Hydroponics System: How Does It Operate?
    - 22.5.1. Soilless Gardening
    - 22.5.2. Components
    - 22.5.3. Rich Nutrients
    - 22.5.4. Freshwater
    - 22.5.5. Light
    - 22.5.6. Oxygen
    - 22.5.7. Root Support
    - 22.5.8. Future Scope of This Technology
- 23. HYDROPONIC FARMING EQUIPMENTS
  - 23.1. Water Pumps
  - 23.2. Air Pumps and Air Stones for Hydroponics Systems
  - 23.3. Water Heaters and Chillers
  - 23.4. Hydroponic Reservoirs, Trays and Flood Tables
  - 23.5. Reservoir Considerations
  - 23.6. Reservoir Use in Various Hydroponic Systems
  - 23.7. Ebb and Flow (Flood and Drain)
  - 23.8. Hydroponic Lighting System Basics
  - 23.9. Grow Room Ventilation
  - 23.10. Climate Control
  - 23.11. Indoor Grow Tents
  - 23.12. Additional Components
- 24. PELLET FERTILIZER MANUFACTURING PROCESS
  - 24.1. Mineral–Organic Addition
  - 24.2. Mixing
  - 24.3. Pelleting
  - 24.4. Cooling
  - 24.5. Sifting
  - 24.6. Bagging
- 25. SEAWEED FERTILISER
  - 25.1. Nomenclature and Taxonomy
  - 25.2. Production and Application Methods
  - 25.3. Nutrient Cycling
  - 25.4. Coastal Eutrophication
  - 25.5. Bio-Remediation in Eutrophic Ecosystems
  - 25.6. Blue Carbon
  - 25.7. Functions and Benefits of Seaweed Fertilizer
    - 25.7.1. Fertilization
    - 25.7.2. Soil Conditioning
    - 25.7.3. Bio-Remediation of Polluted Soils

- 25.7.4. Integrated Pest Management
- 25.7.5. Soil Microbial Response to Seaweed Fertilizer Treatment
- 25.7.6. Resistance to Plant Pathogens
- 26. SEAWEED FERTILIZER PRODUCTION PROCESS
- 26.1. Seaweed Extract as Fertiliser
- 26.2. Seaweed Fertilizer Fermentation Vessel
- 26.3. Principle of Fermentation Equipment
- 26.4. Ingredients of Seaweed Fertilizer
- 26.5. Uses
- 26.6. Process
- 26.7. Features
- 26.8. Advantages of Seaweed Processing Plant
- 26.9. The way heat pump drying equipment operates
- 27. BIS SPECIFICATIONS
- 28. ISO STANDARDS
- 29. CHINA STANDARDS
- 30. PHOTOGRAPHS OF PLANT AND MACHINERY WITH SUPPLIERS CONTACT DETAILS
- Biofertilizer Packing Filling Machine
- Biofertilizer Fermenter
- Bioreactor Machine
- Bio Fertilizer Packaging Machine
- Liquid Bio Fertilizer Plant
- Waste Shredder
- Organic Waste Converter
- HP Steam Sterilizer Horizontal Autoclave
- Fertilizer Cleaner
- Fertilizer Pan Mixer
- Fertilizer Granule Making Machine
- Biofertilizer Granulator
- Blender Machine
- Pulverizer Mills
- Pesticide Making Machine
- Pellet Making Machine
- Fluid Bed Gasifier for Thermal & Electrical
- Compost Machine
- Bucket Elevator
- Steel Jacketed Tank
- Storage Tank
- Ultra Filtration System
- Water Soften Plant
- Tray Dryer
- Ribbon Mixer
- Air Compressor
- 31. FACTORY LAYOUT AND PROCESS FLOW CHART & DIAGRAM
- Biofertilizer Production Layout
- Biofertilizer Production Layout
- Organic Fertilizer Plant
- Biofertilizer Production Layout
- Organic Fertilizer Production
- Process of Production of Bio-Fertilizer
- Experimental Process for Biofertilizer
- Biofertilizer Quality Control

# 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.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. 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.

---

**NIIR PROJECT CONSULTANCY SERVICES** , 106-E, Kamla Nagar, New Delhi-110007, India. **Email:** [npcs.india@gmail.com](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Sun, 28 Apr 2024 20:43:43 +0530