

Agribusiness

[Science](#), [Agriculture](#)



AGRIBUSINESS Agribusiness has evolved over the years since subsistence farming. The farm production has been central to the agribusiness. As the commercialization of farm production gained significance the production and supply of farm inputs, marketing of farm output including value addition (processing) and services to farm sector have expanded leading to proliferation of several independent business units. Agricultural development has been a precursor to economic development. With the growth of agriculture sector, each operation became specialized and had the potential for business. This has led to establishment of numerous firms that cater to various needs of the agribusiness sector. Thus, the gamut of agribusiness enlarged including few sub systems in its realm. Definition “ Agribusiness includes all those business and management activities performed by firms that provide inputs to the farm sector, produce farm products, and/or process, transport, finance, handle or market farm products." Downey and Erickson (1987) Types of Agribusiness The agribusiness sector comprises predominantly of four sub systems; Input supply sub system, Production sub system, Output marketing subsystem and services subsystem. a) Input supply subsystem: It includes all firms that provide input for farm production, such as seeds, fertilizers, pesticides, bio-inputs, farm machinery, capital, labour etc. b) Production subsystem: The individual farms where crops, livestock, mulberry and fish production takes place and firms that are involved in agriculture allied activities such as sericulture, mushroom, apiary production. c) Output marketing subsystem: this includes all the firms that are involved in the marketing channel through which the produce from the farm, either in the raw or processed form reaches the consumer in the

domestic or international market. The major participants are market intermediaries such as, wholesalers, retailers, village merchants, processors, exporters etc. d) Services subsystem: It includes all the firms that provide services such as market information, grading, storage, transport, farm machinery hiring and maintenance, technology transfer, consultancy, commodity exchanges, etc. The globalization of markets, increasing per capita income, education levels etc., created new opportunities and challenges for the agribusiness sector and has led to greater specialization of activities. Evolution of agribusiness sector Agriculture has come a long way from the era of shifting cultivation. The domestication of livestock and initiation of crop production paved way for creation of independently owned farms, where subsistence farming was mainly practiced. Growth of the economy, need for food security for the population, opportunities for exchange and increase in demand for other goods and services led to commercialization of agriculture. Commercial agriculture could be segmented in four distinct phases — green revolution, sustainable agriculture, market led agriculture and supply chain management ("farm to fork"). In this transformation process, several new products and services, firms and management systems have added to the agribusiness sector with the each stage of evolution. Subsistence agriculture is self-sufficient farming in which farmers grow only enough food to feed their family and pay taxes. The typical subsistence farm has a range of crops and animals needed by the family to eat during the year. Planting decisions are made considering what the family will need during the coming year, rather than market prices. Commercial agriculture Green revolution: After independence, the farmers

transformed subsistence agriculture into commercial agriculture. Green Revolution, launched in mid sixties became a landmark in the transition of agriculture in India. The introduction of high yielding varieties in wheat and rice with improved responsiveness to fertilizers and irrigation was collectively referred to as " Green Revolution". The Green Revolution was a government sponsored programme to ensure availability of adequate food for the population (food security) through domestic production. This drive by the government enabled farmers to increase productivity and farm income. Adoption of improved technology was encouraged through a favourable policy environment, which envisaged; (i) increase in domestic production and supply of fertilizers at subsidized prices, (ii) increase in supply of quality seeds, (iii) expansion of irrigation facilities and enabling groundwater usage through subsidized / free electricity, (iv) transfer of technology on a continuous basis, (v) appropriate price policies to motivate risk averse farmers to adopt technologies and ensure fair returns to farmers and (vi) distribution of food grains throughout the country, for providing food to the needy and also stabilize the markets by creation of buffer stock and supply through public distribution system. Emphasis was on increasing production and distribution. Marketing was not given due attention. Sustainable production: The imbalanced fertilizer application and other inputs, such as water, pesticides led to degradation of natural resources, which adversely affected the productive capability of land. To offset this undesirable trend the concept of sustainable production was given major emphasis. Integrated approach for nutrient, pest, water and land management involving manual, chemical, and biotechnologies was advocated. The objective was to increase

productivity by conserving natural resources and effectively integrating various technologies for production. Market led production: In the early nineties (1990s) the economic policies in India were changed in order to globalize the market access and liberalize the business activities giving more scope for private sector participation, especially large firms. As a result the opportunities for export of agricultural commodities increased. The World Trade Organization also introduced new norms for international trade, with specifications for quality, food safety and sanitation. In order to capitalize the export opportunities the firms had to produce conforming to the standards prescribed by the market. Understanding the market needs was advised as the basis for production operations. Though such practices were advocated for the business sector quite long ago, this approach was given greater emphasis to the farming community. The farmer has to understand the market needs not only in terms of quantity to produce but also the quality aspects such as size, colour, residual toxicity, variety etc. the entry of organized retail sector in agriculture produce marketing during late nineties also made it imperative for farmers to understand the market needs and produce accordingly. The growth in market infrastructure through private sector participation and government assistance, establishment of commodity exchanges and better access to market information due the technological developments in communication systems have enabled the farmers to orient themselves to market led agriculture. “ Farm to Fork” (Supply chain management): Supply chain management in agriculture is gaining attention. It is a step forward and complimentary to market led agriculture. In this approach efforts are taken to integrate various elements in the agriculture

produce supply chain to improve the effectiveness and efficiency of the operations and dynamic market orientation, thus enabling a “ farm to fork” integrated system. The elements in the supply chain for agricultural produces are not integrated and there is a dearth of information flow on consumers’ preference, demand, arrivals and prices in various markets. Hence private firms, especially processors, organized retail chains and the government is taking efforts to establish integrated supply chains that would also take into account the interests of the farmers.

Special Features of Agribusiness Sector in India

The production subsystem (farm) is central to the agribusiness sector and the rest of the subsystems revolve around this subsystem. The special features of agribusiness are discussed subsystem wise.

Production subsystem Feature Implications

Entire system dependent on agriculture — climate — natural resources
Fluctuations in farm production, production risk, affects sustainable production
Fragmented and scattered farm holdings
Small marketed surplus, assembling difficult, no economies of scale, variations in quality, less capital, mechanization is difficult
Rainfed area 60 %
Technology adoption less, low production, more risk
Technology and yield
Technology adoption is less, high yield gap
Post harvest management — low adoption
Marketing Mostly at farm, low share in consumer rupee, low value addition

Input subsystem Feature Implications

Fertilizers mostly public sector units
Old Technology, Low production, Subsidized
Government regulated — prevent shortages
Fertigation and micronutrients
Growing market
Biofertilizers and biocontrol agents / biopesticides
Less growth, fragmented and small units, no certification
Pesticides mostly private sector units, new molecules, high price, Indian

companies mostly formulators, Spurious chemicals Farm mechanization Growing market, few large private companies — tractors and power tillers Seeds Few large companies — Multi National Companies (MNCs) and national firms, many regional players. Research and development initiative in private sector is less Output subsystem Feature Implications Market intermediaries Scattered and small size, absorb greater margin, largely passing on risk to farmers, Organized retailing Growing segment, resistance in some States and traditional market intermediaries, Exports Increasing, meeting quality standards is a hurdle, cost advantage in few crops, stiff competition from other countries Imports Fruits, onion, garlic etc., due to low production and cost advantage, export oriented imports — sugar, cashew Processing Less quantity processed, consumer preference and availability of raw fruits and vegetables for greater period of the year, growing market, technology at low level, mostly cottage industries, Services subsystem Feature Implications Market infrastructure Inadequate, most of the sale at farm gate, transactions increasing in commodity exchanges Grading Voluntary, AgMark. Export - compulsory Storage Inadequate at farm level and at assembling points, mostly government owned — Central warehousing, State Warehousing and rural godowns. Cold storages inadequate but increasing Transport / Cold chains Inadequate Organized retailing Growing market, opposition in some states — UP, Kerala by traders Technology development and transfer Larger government role Credit Largely met by nationalized banks — 18 % lending to priority sector, influenced by government policy on agriculture Importance of Agribusiness in Indian Economy 1. India is endowed with varied agro-climate, which facilitates production of temperate, sub-tropical and tropical

agricultural commodities. 2. There is growing demand for agricultural inputs like feed and fodder, inorganic fertilizers, bio-fertilizers. 3. Biotechnology applications in agriculture have vast scope in production of seed, bio-control agents, industrial harnessing of microbes for bakery products. 4. Export can be harnessed as a source of economic growth. As a signatory of World Trade Organization, India has vast potential to improve its present position in the World trade of agricultural commodities both raw and processed form. The products line include cereals, pulses, oilseeds and oils, oil meal, spices and condiments, fruits and vegetables, flowers, medicinal plants and essential oils, agricultural advisory services, agricultural tools and implements, meat, milk and milk products, fish and fish products, ornamental fish, forest by products etc. 5. At present processing is done at primary level only and the rising standard of living expands opportunities for secondary and tertiary processing of agricultural commodities. 6. The vast coastal line and internal water courses provides enormous opportunity for production of marine and inland fish and ornamental fish culture gaining popularity with increase in aesthetic value among the citizens of India.. 7. The livestock wealth gives enormous scope for production of meat, milk and milk products, poultry products etc. 8. The forest resources can be utilized for production of by products of forestry. 9. Beekeeping and apiary can be taken up on large scale in India. 10. Mushroom production for domestic consumption and export can be enhanced with improvement in the state of art of their production. 11. Organic farming has highest potential in India as the pesticide and inorganic fertilizer application are less in India compared to industrial nations of the world. The farmers can be encouraged and educated

to switch over for organic farming. 12. There is wide scope for production and promotion of bio-pesticides and bio-control agents for protection of crops. 13. Seeds, hybrid and genetically modified crops, have the highest potential in India in the future, since the productivity of high yielding varieties have reached a plateau. 14. Micro-irrigation systems and labor saving farm equipments have good potential for the years to come due to declining groundwater level and labor scarcity for agricultural operations like weeding, transplanting and harvesting. 15. Production of vegetables and flowers under green house conditions can be taken up to harness the export market. 16. Trained human resources in agriculture and allied sciences will take on agricultural extension system due to dwindling resources of state finance and down sizing the present government agricultural extension staff as consulting services. 17. The enhanced agricultural production throws open opportunities for employment in marketing, transport, cold storage and warehousing facilities, credit, insurance and logistic support services.

Opportunities for Agribusiness due to Demand side changes Food –

Processed food, fast food – Nutritive food – nutraceuticals / functional

foods – Organic food, no pesticide residues – Demand for fruits and

vegetables – Medicinal plants – ayurveda, siddha – Products -

Mushroom, fish, honey – Organized retailing – Wine – Frozen and

dehydrated produce Non - food – Art and handicrafts – banana fibre, coir

– Demand for flowers, ornamentals, interior decoration, landscaping –

Organic cotton – Natural dyes – Eco-tourism – Cosmetics – plant

based Supply Constraints in availability of natural resources, development of new varieties, hybrids and technologies, changes in government policies,

climate changes, labour shortages, credit flow, market access etc., stimulate agricultural production which in turn would create opportunities for input, output and services subsystem. Some of the likely changes in supply side and the opportunities for agribusiness are given below;

Opportunities for Agribusiness due to Supply side changes

Factor	Opportunities
Climate change	Organic farming, Reduction in subsidies, Resource conservation
Input use — need based application	Labour shortage, Quality Choice of crops, technology, renewable energy
Bio-inputs	compost, vermiculture, enriched FYM, Bio-fertilizer
Micro irrigation	soil testing, agri-clinics, mechanization, herbicides, micronutrients
Factor	Opportunities
Market information	Market access, Excess production, More capital, Need for new technology
Technology transfer	Risk protection, media, journals, commodity exchanges, Cold storage / cold chains, warehouses, financial services, R & D services, e platform, consultancy, firms, private extension
Crop insurance	Technology driven projects, New technology, Biotechnology & nanotechnology, Irradiation, Micro-encapsulation, Cryogenic grinding, Retort pouches, Membrane Technology, Bio-fuel, Super Critical Extraction, precision farming, protected cultivation — poly house, green house, shade net
Bt crops — cotton, brinjal, enzymes, foods, inputs	Increase shelf life, prevent quality loss - Onions, Potatoes, Fruits, Marine, Meat, Spices, Powder of fruits, Vegetables, Spices, Spices, Herbs.
Packaging — prepared curries, pulses etc.	micro filtration of juices, milk, etc
Jatropha, Pungam	Oleoresins of Spices, herbs, etc.
Agriculture allied enterprises	Sericulture - Silkworm Rearing Technology - Silk Yarn Production, value addition & export - Handloom and Textile / Garment Designing
Livestock — Milk and meat chilling and processing — Broiler and Egg	

Production and marketing âžŸ Livestock Feed, vaccine / drug production diagnosis / clinics âžŸ Rearing quails, turkey, white pigs Fish âžŸ Integrated and Intensive Fish Farming, shrimp farming âžŸ Fish Hatchery and feed âžŸ Ornamental Fish âžŸ Frozen and canned products Government programmes that promote agribusinesses Since mid sixties (1965s) the government has played an active role in accelerating agricultural production. Initially, the emphasis was to increase production to ensure food security for the growing population, which led to the ' Green Revolution'. Production subsystem Green Revolution, launched in mid sixties became a landmark in the transition of agriculture in India. The introduction of high yielding varieties in wheat and rice with improved responsiveness to fertilizers and irrigation was collectively referred to as " Green Revolution". Adoption of improved technology was encouraged through a favourable policy environment, which envisaged; (i) increase in domestic production and supply of fertilizers at subsidized prices, (ii) increase in supply of quality seeds, (iii) expansion of irrigation facilities and enabling groundwater usage through subsidized / free electricity, (iv) transfer of technology on a continuous basis, (v) appropriate price policies to motivate risk averse farmers to adopt technologies and ensure fair returns to farmers and (vi) distribution of food grains throughout the country, for providing food to the needy and also stabilize the markets by creation of buffer stock and supply through public distribution system. Stimulating growth in the farm production systems also generates growth in the other sub systems namely, input, output and services sub systems. Presently following schemes are implemented to stimulate agricultural production at farm level. a. National Agricultural Development Programme

(NADP) The Government of India have introduced a new Additional Central Assistance scheme to encourage States to draw up plans for their agriculture sector more comprehensively, considering the agro — climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries. The National Agriculture Development Programme (RKVY) aims at achieving 4% annual growth in agriculture sector during XI Plan period by ensuring holistic development of agriculture and allied sectors. This programme provides greater flexibility and autonomy to the states to develop and pursue on the basis of their priorities through State and District agricultural plan. The objective of the scheme is to increase public investment in agriculture, reducing yield gap in key crops through focused interventions, maximize returns to the farmers and bringing quantifiable changes in the production and productivity of agriculture and allied sectors. The pattern of funding is 100% grant by Government of India. The projects relating to Agriculture, Animal Husbandry, Dairy, Fisheries and also minor irrigation are focused under this programme. b. Support to State Extension Programme for Extension Reforms through ATMA In order to involve farmers' groups in planning and implementation and empowering them to achieve best results in transfer of technology, a centrally sponsored scheme to support State Extension Reforms has been implemented in Tamil Nadu on Pilot basis in 9 districts covering 133 blocks through Agricultural Technology Management Agency (ATMA) with funding pattern of 90: 10 between Government of India and State Government. In addition, the Government of India has accorded permission to extend the ATMA scheme to the remaining 19 districts covering remaining 248 blocks except Nilgiris and

Chennai districts. TAWDEVA (Tamil Nadu Watershed Development Agency) has been nominated as State Nodal Agency for all 28 ATMA districts. Tamil Nadu Agricultural University, Coimbatore has been nominated as State Agricultural Management Extension Training Institute (SAMETI) The pilot scheme of ATMA in 9 districts has been implemented from September 2006 after creation of administrative structure at Block level exclusively for ATMA represented by officials of all the departments, farmer representatives, women and NGO representatives. Farmer representatives representing Agriculture and 9 line departments formulating block action plans to fulfill their local needs and farmer representatives at block level representing Farmer Advisory Committee is monitoring the implementation of Block Level ATMA activities ATMA is fulfilling the needs of training, demonstrations, Farmer interest Group formation, Capacity Building and Revolving funds, Interstate and Inter-district exposure visits. The best performing farmers and the district ATMAs are felicitated with awards at Block, District and State Levels. c. Irrigated Agriculture Modernization and Water Bodies Restoration and Management (IAMWARM) Project in Tamil Nadu is being implemented with the assistance of World Bank over a period of six years (2007-08 to 2012-13) through Water Resources Organization (WRO) and Agricultural, Horticulture, Agricultural Engineering, Animal Husbandry and Fisheries along with Tamil Nadu Agricultural University. The IAMWARM Project aims to improve the service delivery, productivity in irrigated agriculture with effective integrated water resource management in selected 63 sub basins in Tamil Nadu. Activities like agricultural Intensification and diversification, enhancing market access and agribusiness opportunities, strengthening

institutions and instruments dealing with water resource management thereby improving the conveyance efficiency are being practiced in the project areas. Some of the activities of the project are; âžŸ Demonstration on various crops and organic farming âžŸ Distribution of critical inputs-like Bio-fertilizers, Micro Nutrient mixture, Gypsum, Blue Green Algae etc. âžŸ Distribution of Farm Implements like Hand operated Sprayers, Power Sprayers, Seed Drills and Green manure tramples and âžŸ Information,/Education and Communication activities (IEC) like Publicity and Capacity Building through training, exposure visits to farmers. d. National Food Security Mission (NFSM) Introduction: To implement the resolution of National Development Council (NDC) which envisages increasing the production of Rice, Wheat and Pulses to the tune of 10 million tons, 8 million tons and 2 million tons respectively, a Centrally Sponsored Scheme, 'National Food Security Mission' (NFSM) was launched in 2007-08 in 311 districts of 17 States. NFSM has three sub-components viz: NFSM-Rice, NFSM-Wheat and NFSM-Pulses. Mission Objectives: Increasing production of rice, wheat and pulses through area expansion, and productivity enhancement in a sustainable manner in the identified districts of the country through: âžŸ Restoring soil fertility and productivity at the individual farm level; âžŸ Creation of employment opportunities; and âžŸ Enhancing farm level economy to restore confidence among the farmers. Implementation Strategy: The approach adopted includes active involvement of all stakeholders in planning, execution and monitoring of the programme, promotion and extension of improved technologies (seed, nutrients, plant protection, soil amendments, resource conservation, farm machines and

tools), integration of interventions with district plan, regular monitoring and concurrent evaluation for impact assessment. e. National Horticulture Mission The National Horticulture Mission has been launched as a Centrally Sponsored Scheme to promote holistic growth of the horticulture sector through an area based regionally differentiated strategies. The scheme will be fully funded by the Government and different components proposed for implementation financially supported on the scales laid down. To achieve the above objectives, the mission would adopt the following strategies: 1. Ensure an end-to-end holistic approach covering production, post harvest management, processing and marketing to assure appropriate returns to growers/producers. 2. Promote R&D technologies for production, post-harvest management and processing. 3. Enhance acreage, coverage, and productivity through; a. Diversification, from traditional crops to plantations, orchards, vineyards, flower and vegetable gardens. b. Extension of appropriate technology to the farmers for high-tech horticulture cultivation and precision farming 4. Assist setting up post harvest facilities such as pack house, ripening chamber, cold storages, Controlled Atmosphere (CA) storages etc, processing units for value addition and marketing infrastructure. 5. Adopt a coordinated approach and promotion of partnership, convergence and synergy among R&D, processing and marketing agencies in public as well as private sectors, at the National, Regional, State and sub-State levels. 6. Where appropriate and feasible, promote National Dairy Development Board (NDDB) model of cooperatives to ensure support and adequate returns to farmers. 7. Promote capacity-building and Human Resource Development at all levels. f. Wasteland

Development: This scheme is implemented by the Tamil Nadu Government. Two acres of wasteland is given to landless labourers and fruits trees suitable for the region are planted with assistance from the government. The new owners have to manage the farm and benefit from the harvest. Thus, unutilized wasteland is brought under cultivation, supply of fruits increases and labourers become owners of land and they get stable employment.

National Horticulture Board (NHB) National Horticulture Board (NHB) was set up by the Government of India in 1984 as an autonomous society under the Societies Registration Act 1860 with a mandate to promote integrated development in horticulture, to help in coordinating , stimulating and sustaining the production and processing of fruits and vegetables and to establish a sound infrastructure in the field of production, processing and marketing with a focus on post harvest management to reduce losses.

Schemes are; âž¢ Development of commercial Horticulture through Production and Post-Harvest Management. âž¢ Capital Investment Subsidy for Construction / Modernization Expansion of Cold Storage and Storage's for Horticulture Produce âž¢ Technology Development and Transfer for Promotion of Horticulture âž¢ Market Information Services for Horticulture Crops âž¢ Horticulture Promotion Services (including terms of reference for Techno-economic Feasibility Study)... Seeds Central Government schemes for providing quality seeds are; âž¢ Central Sector Scheme on Transport Subsidy for the movement of Seeds to the North-Eastern States, Sikkim, Himachal Pradesh, Jammu & Kashmir, Uttaranchal and Hill Areas of West Bengal. âž¢ Quality Control Arrangement on Seeds âž¢ Seed Bank Scheme i) Central sector scheme for establishment & maintenance of seed bank

(ii) Guidelines for Implementation of Seed Bank Scheme

Central sector scheme for implementation of legislation on plant varieties and farmers rights protection

Input subsystem The government provides subsidies for fertilizers, which aims at supporting the fertilizer industry. The government also arranges for production of bio-inputs like bio-fertilizers etc., and sells them to the farmers at subsidized rates. Through the policy and better seed inspection, the government ensures that the farmers get access to quality seed. The government was providing subsidy for micro irrigation systems especially drip and sprinkler so as to enable farmers to improve water use efficiency.

Output sub system Various departments of the government provide different schemes to agribusiness firms for promoting processing and exports. Some of the schemes are;

a. Small Farmers' Agri-Business Consortium The central government has established the Small Farmers' Agri-Business Consortium (SFAC) for promoting small agribusinesses. The major objective of the SFAC is to promote innovative ideas for generating income and employment in rural areas through support to the various types of agribusiness. The scheme envisages the provision of financial assistance to the Small Farmers' Agri-Business Consortium, in the form of Grants-in-aid for achieving the objective given above.

b. Ministry of Food Processing: Major schemes offered are;

1. Scheme for Technology Upgradation/ Establishment/Modernization of FPI, Modernization of Pulse Milling Unit - installation of driers and dust control system, Setting up of Mini Pulse Processing Unit
2. Scheme for Human Resource Development — setting up Food Processing and Training Centre (FPTC), Creation of Infrastructure facilities for running Degree / Diploma Courses and Training Programme for

Food Processing, Entrepreneurship Development Programme 3. Scheme for Quality Assurance and Safety Concept - Total Quality Management (TQM), Promotion of Quality Assurance and Safety Concept, Bar Coding, Strengthening of Codex Cell, Setting up of Quality Control Laboratory, R & D in Processed Food Sector 4. Scheme for Strengthening of Nodal Agencies — State Institutions 5. Scheme for Backward and Forward Integration and other Promotional Activities - Backward Linkages, Forward Integration, Generic Advertisement, Promotional activities such as participation in Exhibition / Fairs , Supporting Seminars / Workshops / Conferences etc. and Studies and Surveys, Strengthening of Fruit and Vegetable Processing Directorate, Strengthening of Industry Associations, Food Fortification 6. Scheme for Infrastructure Development — Food Parks, Packaging Centre, Integrated Cold Chain Facilities, Value Added Centre, Irradiation Facilities Agricultural and Processed Food Products Export Development Authority (APEDA) An Integrated System for Export Promotion and Support Schemes viz., - Financial Assistance Scheme (FAS) - Schemes for Market Development, Infrastructure Development , Quality Development, and Research and Development - Market Development Assistance Scheme (MDA) - Transport Assistance (Air/Sea) The Tamil Nadu government offers a scheme on ‘ Anna Marumalarchi Thittam’ for promoting food processing industries in the State. The scheme provides 30 per cent back end subsidy for the new units established. Services subsystem Agri-clinics and agri-business centres: The Small Farmers Agribusiness Consortium, Ministry of Agriculture and NABARD, Mumbai together operate a scheme for establishing agri-clinics and agribusiness centres. This scheme is implemented by MANAGE, Hyderabad

through various institutions across the country. Graduates from SAUs are eligible for participation in the scheme. The scheme comprises of eight weeks training on various technical aspects of agribusiness and the managerial aspects including accounting and business project formulation for funding from nationalized banks. Lending by banks for agriculture sector: All banks have been advised to allocate 18 per cent of the lending to the priority sector, which includes agriculture. Such huge credit allocation is done as crop loans, loans to buy farm machineries and equipments, livestock etc. Government promotes public private partnerships in technology transfer and facilitates favourable climate for private firms to engage in technology transfer. Government also promotes contract farming and crop insurance.