THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
April 2024 Vol.4(4), 1343-1349
Popular Article

Importance and Prospects of Indian Agriculture in Present Context

Amit Anil Shahane
Assistant Professor, College of Agriculture, (Central Agricultural University, Imphal), Kyrdemkulai, Meghalaya.
https://doi.org/10.5281/zenodo.10940218

Abstract

Agriculture is the major sector providing provisional services and ecological services in India. The agriculture provide employment to around 43 % population even though its share in national GDP is 16 to 17 %. The good and services provided by the sectors are not substitutable by any other sectors and hence its hold is significance in all times. The sector has several allied branches and are changing significantly in new era. Hence it is essential to overview importance and scope of agriculture in India prospective. The importance is expressed as its contribution to provisional services, ecosystem services, employment generation and its contribution to national economy. The agriculture sector has wide prospects which can be defined by potential for acting as green energy sector, potential for recycling of waste and water, Promotion of input production on farm, enhancing the management skills, crop and/ or enterprise diversification, natural resource conservation, potential for agro-industrial sector and increase export potential from natural and organic farming.

The India becomes independent with agrarian culture with a major contribution of agriculture and allied activities to gross domestic products. Considering its contribution to the national income, employability and to food security, the major works in development of infrastructure such as development of irrigation projects, commodity-based investment in research and development leading to phenomenal increase in their production. This phenomenal increase in production is named by different revolutions such as green revolution, white revolution, silver revolution, etc. This leads to change in scenarios of India from a net importer of different agricultural commodity (including food-grains through schemes such as PL-460) to self-sufficient in most of consumable commodity followed by self-reliant. At present, the agriculture contributes to 11.9 % to the total export from India; while its share in total import is only 3.81 %. As agriculture have large array of allied branches, the array of agricultural activities is much broader than insuring the food and nutritional security. In such condition, the detail knowledge about the importance of agriculture as a whole is worthy. Besides importance, as agriculture is open to sky industry and grow on finite natural resource with costly artificial resource, different shortcomings were observed agriculture. Over the duration these shortcomings is more intense leading to creation of threat to sustained agriculture productivity and need to be addressed to meeting

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

the increasing demands from agricultural and allied sectors in India. This article describes the importance and scope of agriculture on first part with the help of different statistical evidences.

Importance of Agriculture: An Indian prospective:

1. **Endowment of provisional services**: The agriculture is single most source of provisional services meeting the basic needs of human being and its belongings. The 5 F's obtained from agriculture (food, fodder, fuel, fibre and furniture) are major provisional services provided by agriculture. According to Costanza *et al.* (1997) total average global value of annual ecosystem services from agriculture in 128 ($\$ yr^{-1} \times 10^9$). At the same time, agri-products earning hard cash (sugarcane, sugarbeet, cotton, etc.) and supplying row material to different agro-industries is another aspect of provisional services from agriculture. The contribution of animal components in provisional services such as milk and eggs production is increases which can be seen from their production (198.4 million tonnes for milk and 114.4 billion (numbers) for eggs); similarly the production of fish and meat is 14.07 million tonnes and 8.599 million tonnes. As the animal origin products are rich source of different nutritional components their increasing production contributes significantly to human nutrition.
2. **Ecosystem services**: The agro-ecosystem is a part of modified natural ecosystem formulated for providing provisional services; while besides provisional services, agriculture contribute for human welfare through different ecosystem services. The area acquired by agriculture and range lands is 25 % and is expected to increase (Swinton et al., 2007); hence ecosystem services provided will increases in future. The contribution of agro-ecosystem to ecosystem services through clean water, biocontrol and other biodiversity benefits, climate stabilization, and long-term soil fertility was reported by Robertson *et al.* (2014). The FAO give the details of ecosystem services provided by agriculture and negative impact of agricultural practices on ecosystem services.
3. **Employment generation:** The agriculture contributes to 54.6 % tot the total employment generated in India as per the 2011 census (Anonymous, 2021); while this share is decreasing and according to world bank data, the share of agriculture to total employment in India is 43 % in 2019.
4. **Contribution to national economy:** Agriculture contributes 17.8 % to gross value added of India for year 2019-20 at current price which is Rs. 3257443 crore INR. The budget allocation for the year 2020-21 for different central sponsored schemes in agriculture is 134399 crores. The budget allocation for Department of Agricultural Research and Education is 8362.58 crores for year 2020-21. The share of budget allocation to Agricultural Research and Education is 5.48 % (Anonymous, 2019).
5. **Preventing migration from rural to urban area:** The availability of work in rural area through agriculture and allied sector helps in reducing the migration of labourers to urban area. Establishment of agro-industries, small and medium enterprises through farmer producer organization and self-help groups and increasing the emphasis on allied enterprises such as poultry, goat and sheep rearing, bee keeping, etc.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

will play important role. These all-activities generation highly liquid and firm source on income thereby retaining labourer force from rural area in-situ and reduce migration rate.

6. **Strengthening the national economy through export potential**: The contribution of agriculture to export is three times more than its contribution to the total nation import. The agriculture is earning Rs. 274571.28 crores rupees which are 11.9 % of the total foreign exchange earned by India in 2018-19.
7. Several agricultural commodities are raw material for the different agro-industries and sugarcane industries and cotton/ textile industry is oldest and best examples for this. At the same time potato and tomato as well as vegetable processing industries also need sustained and quality supply of raw material.
8. The animal components in agriculture reared for milk and milk product is very important source of liquid capital and also act as avenue for woman empowerment as most of the work is done by woman.

Prospects of Agriculture in India:

- **Reducing the dependence on arable crop production:** The increased dependence of arable crop cultivation on subsidy, increased need of crop insurance, as well as increased events of loan viewer schemes indicates that, arable crop production in more fragile to environmental stresses and low remunerative due to higher prices of inputs. In this context, attaching arable crop production through different economically profitable enterprises is need of the present time. The weaning of area from arable crop is not possible beyond certain extent due to its place in human diet. Therefore, there is scope for identifying and practicing suitable new enterprise combination with arable crops.
- **Weaning of population from agriculture and increase their engagement in other activities**: There is wide negative gap between employment generated from agriculture and its contribution to gross domestic product. The contribution of agriculture at present to gross value added is 17.8 %; while work for evolved in agriculture is 43 presents at present. In such condition weaning of population and their engagement in other activities is need of hour. The farm mechanization is one avenue of reducing the direct involvement of human labour in agriculture.
- **Increasing the dependence on on-farm inputs and reducing the purchased inputs**: In agrochemical based intensive farming, the dependency of crop cultivation on purchased input is increases day by day due to need for higher yield per unit area. This dependence not only increases the cost of cultivation, but also increases the risk of higher monitory losses due to their use. The increase in prises of agrochemicals and other purchased inputs forces marginal and small farmers to again divert towards the on-farm inputs and this was clearly seen in 2020 due to COVID-19 scenarios. The slogan local for vocal is born out of it. In such condition there is large scope to prepare on farm inputs and their sale. This is more common in specialized farming such as natural farming and organic farming.
- **Enhancing the management skills in order to have higher resource use efficiency:** The agronomist is responsible for management of all farm activities. The managerial skill of agronomics is deciding

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

factors of efficient use of resources as well as preventing the degradation of natural resources. In this regard, there is large scope for human resource development and this can be seen from increasing emphasis on the entrepreneurship development. The different training organized by SAU and ICAR for preparation of vermin-compost and different biodynamic formulation are best example for this.

- **Reducing natural resource degradation and their conservation:** The resources such as land/soil, water, plant, nutrients and capital are degrading rapidly due to extractive farming. The status of land degradation is given by Bhattacharyya et al. (2015) indicates the severity of land degradation in India and need of attempt to improve the health of soil (Table 1).

Table 1. Status of land degradation in India

Sl. No.	Causes of land degradation	Area under land degradation (million ha)
1	Water erosion	93.7
2	Wind erosion	9.5
3	Water logging	14.3
4	Salinity/Alkalinity	5.9
5	Soil Acidity	16.0
6	Area with complex problem	7.4
	Total	146.8

The need and scope for increasing water use efficiency is judged from the irrigation project efficiencies in India which hardly exceeds 35-40 %. At the same time, crop such as rice require 3000-5000 litres of water to produce a kg of rice with water use efficiency of 3.7 kg/ha-mm. The generalize water use efficiency of few crops is mentioned in table 2. Considering this there is need to take necessary steps in order to improve water use efficiency.

Table 2. Water use efficiency of important crops.

Sl. No.	**Crop**	**Water use efficiency (kg/ha mm)**
1.	Rice	3.7
2	Sorghum	9.0
3.	Pearl millet	8.0
4.	Maize	8.0
5.	Groundnut	9.2
6.	Wheat	12.6
7.	Finger millet	13.7

The nutrient use efficiency was discussed widely in different literature and generalized values of for

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

use efficiency of nitrogen > 40 %, phosphorus 15-20 % and potassium 45-50 % were reported. As most of the nutrients are applied through chemical fertilizers and are highly subsidised, the economics losses are very high. Besides that, these nutrients cause various form of pollution such as greenhouse gas emission, eutrophication, air pollution, etc. Hence there is scope and need to find the different way for increasing use efficiency of these nutrients.

The degradation of plant resource base is indicated by term 'genetic erosion'. It is defined as the permanent reduction in richness or evenness of common localized alleles or the loss of combination of alleles over time in a defined area. In present day world, the crop varieties developed for higher yield of superior in any particular character. For this purpose, same genetic material used and such varieties are grown over large area. This leads to narrowing down the genetic base of crop plants. In this condition there is scope for both in-situ and ex-situ conservation of genetic diversity of crop plants as well as development of human resource for in-situ conservation of natural resource base.

- In case of agrochemicals, very small part of it is utilized for actual killing of pest; while large part remains in plant or in soil causing accumulation of their harmful residue. Therefore, replacement of agrochemicals with bio-pesticide and development of methodologies for reducing their application rate had large scope. The new technology such as spraying by drone is one such advance; which use of artificial intelligence in broad area getting the significance at present.
- The inefficient use of capital is indicated by increased frequency of loan viewer schemes and increased dependency on insurance due to climate changes induced natural calamities. In such conditions, identification of climate resilient crops or cropping schemes as well as different adaptation and mitigation strategy is need of hours.
- **Crop diversification:** The diversification holds a key of sustainability and as the sustainability of different agricultural production system (Timsina and Connor, 2001) is under threat; there is scope of crop diversification. The crop diversification also has several additional benefits such as reducing the pest and disease incidence, reducing the crop associated and crop bounded weeds, etc.
- **Enterprise diversification:** The dependence on single crop or cropping system or any allied enterprise is harmful, as if fall susceptible to any biotic or abiotic stress, then there is complete failure. Under such condition incorporation of different enterprises helps in reducing the risk of complete failure as also provide opportunity of natural resource cycling.
- **Potential to act as green energy generation sector:** As the energy crises is getting more intense, there is need of increasing energy production from agricultural commodity and one such attempt is energy production from cereal crops residue, sugarcane, residue of mustard, etc. Besides that, energy production from oil of crops such as Jatropha one best example.
- **Potential for recycling of waste**: The footprint of human being on the natural resources are increasing continuously not alone due to increasing their population but also due use of more and more natural

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

resources per person to meet the secondary needs. The agriculture provide avenue to absorb the waste generated through different processing such as composting, vermi-composting, etc.

- **Potential of recycling of water (Grey and black water):** Due to shortage of fresh water, the concept of multiple use of water getting the importance. The role of water in different enterprise of agriculture is differing and hence same water can be utilized more than once for productive purpose.
- **Avenue for mitigation of climate change:** In India, 12.24 million ha area is under culturable wasteland and 16.99 mha. Area is barren and uncultivated. Besides that, nearly 44.82 mha. area is not available for cultivation (Anonymous, 2021). This land can be utilization of growing biotic carbon stock which reduces the CO_2 from atmosphere and store in the biotic pool. As the carbon emission of India is expected to grow due to increasing need of growing population, utilization of such land as carbon stock generates large scope for training of human resource, development of land, identification and planting of suitable plants, etc.
- **Potential for development of agro-industries in India:** The vegetable and fruit production of India is 189.45 mt. and 100.46 mt., respectively. Being a perishable commodity, the surplus production there is scope for agro-industry development. At the same time, due to increasing population of middle-income groups, the buying power of human being is increased and is ready to pay for processed products. For export of perishable products, processing is must. Considering all of the above, there is scope for development of agro-industries in India.
- **Potential for enhancing export of Indian farmers (organic farming):** The demand of organic products in both international and domestic market is increasing rapidly. At the same time, area under organic farming is increases in India with present area of 3.67 million ha out of which 2.299 million ha is cultivated area and 1.37 m ha is wild harvest (APEDA 2021) and increasing again. Considering the demand in international market, India had potential to increase the export. Besides that, the organic production system also needs assistance for certification process and here trained human resource is required for the same. This also creates scope for human resource development.

References

Anonymous 2019. Agricultural Statistics at a glance, 2019, Directorate of Economics and Statistic, Department of Agriculture, Cooperation and Farmers Welfare. Ministry of Agriculture and Farmers Welfare, Government of India. available online on: www.agricoop.nic.in.

Anonymous 2021. Annual Report 2020-21, Department of Agriculture, cooperation and farmer welfare, Ministry of Agriculture, cooperation and farmer welfare, Govt. of India, available online on: www.agricoop.nic.in.

APEDA. 2021. Agricultural and processed food products export development authority, Ministry of Commerce and Industry, Government of India, Available online at http://apeda.gov.in/apedawebsite/organic/Organic_Products.htm#:~:text=As%20on%2031st%20March%202020,Hectare%20for%20wild%20harvest%20collection.

Bhattacharyya, R., Ghosh, B.N., Mishra, P.K., Mandal, B., Rao, C.S., Sarkar, D., Das, K., Anil, K.S., Lalitha, M., Hati, K.M. and Franzluebbers, A.J. 2015. Soil degradation in India: Challenges and potential solutions. Sustainability 7, 3528-3570; doi:10.3390/su7043528.

Costanza, R., D'Arge, R., de Groot, R., Farberk, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R.V., Paruelo, J., Raskin, R.J., Suttonkk, P. and Den Belt, M.V. 1997. The value of Worlds natural ecosystem services and natural capital. Nature **387**: 253–260.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com
Published 08.04.2024

Robertson, G.P., Gross, K.L., Hamilton, S.K., Landis, D.A., Schmidt, T.M., Snapp, S.S. and Swinton, S. 2014. Farming for ecosystem services: An ecological approach to production agriculture. *Bioscience* **64**(5): 404–415.

Swinton, S.M., Lupi, F., Robertson, G.P. and Hamilton, S.K. 2007. Ecosystem services and agriculture: Cultivating agricultural ecosystems for diverse benefits. *Ecological Economics* **64**(2): 245–252.

Timsina, J. and Connor, D.J. 2001. Productivity and Management of Rice–Wheat Cropping System: Issues and Challenges. *Field Crops Research* **69**(2): 93–132.

Official Website
www.thescienceworld.net
thescienceworldmagazine@gmail.com

Published 08.04.2024