CHALLENGES AND PROSPECTS OF GROUNDNUT PRODUCTION IN INDIA

Abstract

Groundnut, often known as peanut, is a significant oilseed crop farmed worldwide for its oil, food, and feed. In 2021-22, global groundnut production is 50.76 million tonnes with China being the leading producer and India being the second largest producer. In India total production tally is 10.1 million tonnes with Gujarat topping the list. Even being an important oilseed crop, it has been facing various challenges namely significant decline in area, production in all tradition Groundnut growing states barring West Bengal and Rajasthan. This is owed to some of the factors like uneven distribution and late on-set of monsoon, relative profitability of competitive crops, high cost of cultivation due to higher wage of human labour, lack of cost-effective mechanization, severe incidence of pests like root grubs etc. It is estimated that out of 437 groundnut growing districts of 15 major states of India, 174 districts are in the category Low Area and High Yield where there is scope of area expansion through comprehensive efforts, 9 districts fall in the category of High Area and Low Yield where there is a scope for varietal and other technological intervention and 242 districts belong to category Low Area & Low Yield where there is a possibility of both area expansion and technology intervention by the concerned organisations. Since India is heavily dependent on imports of edible oils, it can reduce import burden by increasing domestic production through multi-faceted approaches.

Keywords: Prospects of Groundnut, Agricultural Economy

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I. INTRODUCTION

The term "poor man's nut" is often used to describe groundnuts or peanuts. It is now a significant food and oilseed crop. This plant has never been discovered in the wild and is indigenous to South America. The two Greek terms Arachis, which means a legume, and hypogaea, which means below ground, are combined to produce the botanical name for groundnuts, Arachis hypogaea Linn. An annual plant called groundnut can be erect or prostrate. It is primarily found in warm temperate, tropical, and subtropical regions. Cash crops like groundnut give farmers a living and a means of subsistence. By feeding livestock nutrient-rich fodder and consuming groundnut kernels, which are high in protein and energy, it also improves the health of farm families.

With 18.60 million tonnes production, China tops the list, followed by India and Nigeria with 37, 13 and 8 percent, respectively of the 50.76 million tonnes of global production in 2022–23, respectively (International Production Assessment Division, USDA, 2023).

II. AREA, PRODUCTION AND YIELD SCENARIO OF GROUNDNUT

In India groundnut crop is mostly grown in the Ganges, Godavari, Indus, Krishna, Luni, and Tapti food producing unit (FPUs) (Kadiyala *et al.,* 2021). With respect to state, Gujarat (36%), Rajasthan (14%) and Andhra Pradesh (14%) are the leading states in terms of acreage of groundnut. With respect to production, Gujarat (40%), Rajasthan (19%) and Tamil Nadu (10%) are the leading states. Groundnut production in India is anticipated to reach 10.1 million tonnes in 2021-22 down from 10.20 million tonnes in 2020–21. Likewise, the groundnut area is also expected decline from 6.00 million ha in 2020-21 to 5.7 million ha in 2021-22, according to the 4th advance estimates of Directorate of Economics & Statistics of Government of India.Gujarat stands first in groundnut production (44.38%) followed by Rajasthan (16.83%) and Tamil Nadu (9.36%) (Economic Survey, 2022-23).

III. ECONOMIC, NUTRITIONAL AND ECOLOGICAL SIGNIFICANCE OF GROUNDNUT

In the Indian setting, groundnut, often known as peanut, has major economic, nutritional, and ecological significance.

1. Economic significance

- **Agricultural Economy:** Groundnut is an important oilseed crop in India and makes a sizable contribution to the country's agricultural economy. It is cultivated in many different agro-climatic zones and supports the livelihoods of many farmers and labourers. In the fiscal year 2020, the value of groundnuts in the Indian economy was close to 349 billion INR. Nearly 30 per cent of oilseeds sector's GVO that year came from this group of oilseeds (National Statistical Office, Ministry of Statistics and Programme Implementation, 2022).

- **Export and Revenue:** India is one of the biggest producers and exporters of groundnuts in the world. The export of groundnuts and the goods made from them, such oil and snacks, brings in a sizable sum of money for the nation. India is the

world's top groundnut exporter. India exported 6.69 lakh metric tonnes of groundnuts to the world in 2022–2023 for a total of Rs. 6,735 crores (832 USD Millions). Indonesia, Vietnam, the Philippines, Malaysia, and Thailand are the major export markets between during 2022-23 (https://apeda.gov.in/apedawebsite/SubHead_Products/Ground_Nut.htm).

- **Employment Generation:** Groundnut processing and production lead to employment opportunities in both rural and urban locations round the year. This covers groundnut product farming, harvesting, processing, trading, and retailing.

2. NUTRITIONAL IMPORTANCE

- **Protein and Energy Source:** For vegetarians and vegans, groundnuts are a crucial nutritional component since they are a high source of plant-based protein. They offer a well-balanced selection of the essential amino acids for human nutrition.

According to the U.S. Department of Agriculture, 100 grams of peanuts contain:
• Energy – 567 kcal • Protein – 25.8 g • Dietary fiber – 8.5 g • Carbohydrates – 16.13 g • Sugars – 4.72 g • Iron – 4.5 mg • Calcium – 92 mg

- **Healthy Fats:** Due to its heart-healthy monounsaturated and polyunsaturated fats, which can help lower the risk of cardiovascular diseases, groundnut oil is frequently used in cooking.

- **Vitamins and Minerals:** Groundnuts are a good source of important vitamins (such the B vitamins) and minerals (including magnesium, phosphorus, and zinc), which support good health.

According to the U.S. Department of Agriculture, 100 grams of peanuts contain:
• Sodium – 18 mg • Potassium – 705 mg • Vitamins and minerals *viz.,* vitamin E, vitamin B_1 (thiamine), vitamin B_3 (niacin), vitamin B_9 (folate), biotin, copper, magnesium, manganese, and phosphorus

3. Ecological Significance

- **Crop Rotation and Soil Health:** Because they are legumes that fix nitrogen, groundnuts are frequently included in crop rotation systems. By adding nitrogen to the soil, this increases soil fertility and decreases the demand for synthetic fertilizers.

- **Biodiversity Support:** Groundnut fields can provide as a habitat and a source of food for a variety of beneficial insects, birds, and small mammals. This promotes environmental stability and biodiversity preservation.

- **Efficiency in Water Use:** Groundnut is noted for using less water than other oilseed crops, which is crucial in areas with limited water resources.

- **Reduced Erosion:** Erosion is lessened thanks to groundnut plants' vast root systems, which also aid in soil conservation.

IV. CHALLENGES IN GROUNDNUT PRODUCTION IN INDIA

Numerous obstacles could affect the amount, quality, and overall sustainability of India's groundnut output. Several of these challenges include:

1. **Climate Variability:** Changes in temperature and rainfall patterns have an impact on the cultivation of groundnuts. Reduced yields and crop failure can be caused by erratic monsoons, droughts, and heatwaves (https://www.financialexpress.com/market/commodities-poor-rain-lower-yield-price-hit-groundnut-sowing-in-gujarat-2601925/).

   Variability in groundnut area is more in Rajasthan (22.1%) followed by Odisha (17.9%) and Tamil Nadu (15.4%) due to climate variability in these states in the last 25 years. But variability in groundnut production is more in Gujarat (41.3%) followed by Andhra Pradesh (38.4%) and Rajasthan (30.7) mainly due to erratic rainfall, outbreak of peats and diseases (Table 2).

   Recent studies using crop simulation models to examine groundnut yields in 2050 reported that there may be about 25% decrease in groundnut yields compared to 2010 (Singh *et al.,* 2014). Numerous biotic and abiotic stressors exist both globally and in India that restrict groundnut productivity. However, it has been found that the main determinants limiting the yield are heat and drought stress (Prasad *et al.,* 2009a, 2009b). According to projected models, the optimistic case for climate change by 2050 will see a 2.3 to 43.2 per cent change in groundnut yields throughout different regions of India. However, when economic (population and income) and market variables (elasticities, trade, etc.) were also taken into account, the change in groundnut yields ranged from 0.9 to 16.2 per cent. The percent change in groundnut yields under a pessimistic scenario for climate change would be between 33.7 and 3.4 when only the climate is taken into account and between 11.2 and 4.3 when additional economic and market factors are taken into account(Kadiyala *et al.,* 2021). The optimum temperature range (20-30 °C) needed for the crop was already being approached or exceeded during the crop's growing season (Weiss, 2000).

V. LOW YIELD AND LOW EXPANSION

Despite advancements in groundnut variations, high-yielding, disease-resistant, and drought-tolerant varieties are still required in order to thrive in India's complex agro-climatic conditions (https://www.financialexpress.com/market/commodities-poor-rain-lower-yield-price-hit-groundnut-sowing-in-gujarat-2601925/). It is estimated that about 242 groundnut

growing districts have very low area and low yield that many of these districts have edaphic and climatological conditions suitable for groundnut productio

VI. DECLINING AREA AND PRODUCTION OF GROUNDNUT

Shift in consumption habits, tastes and preferences of the consumer and shift in cropping pattern from oilseeds especially groundnut towards commercial crops like soybean, cotton, and maize etc. because of higher profitability in these crops especially in Gujarat leading to danger of food and nutritional insecurity. Groundnut area in the country has been in downward trend i.e., during the period of 1996-97 to 2020-21, groundnut area has declined significantly by CAGR of 1.70 per cent per year. However, there is a slight insignificant increase in groundnut production of about one per cent in the same period. This is attributed by improved HYVs, effective management of pests and diseases, use of improved machineries, expansion of area under irrigation etc.

1. **Aflatoxin Contamination:** Some molds that can develop on incorrectly stored groundnuts can produce poisonous substances called aflatoxins. Consuming them carries significant health concerns, and exporting groundnuts may face trade restrictions as a result.

2. **Soil Degradation:** Continuous cultivation of groundnuts without using good soil management techniques can result in soil erosion, nutrient depletion, and decreased soil fertility. To lessen these consequences, crop rotation and environmentally responsible soil management techniques are crucial.

VII. INADEQUATE INFRASTRUCTURE

Groundnut processing facilities, transportation systems, and storage facilities are frequently absent or insufficient in rural locations. This results in post-harvest losses and a decline in quality. This also leads to selling of produce to the local village traders by the farmers especially small and marginal farmers where they fetch meagre prices for their produce. Nearly 81.66 per cent marginal and 76.66 per cent small farmers sell their produce to the local village traders. (Anonymous, 2014)

1. **Market Fluctuations:** Groundnut prices might fluctuate because of things like global market dynamics, shifts in demand, and a lack of channels for farmers to lock in prices.

2. **Limited Mechanization:** Planting, weeding, and harvesting are labour-intensive processes involved in growing groundnuts. Modern agricultural equipment and machinery are sometimes lacking, which can result in inefficiencies and higher labour expenses.

3. **Access to Financing and Technology:** Many smallholder groundnut farmers lack sufficient access to financing to finance the acquisition of inputs and the adoption of contemporary agricultural technologies that could increase their output and profitability.

4. **Extension Services:** It's possible that not all groundnut farmers are adequately reached by extension services, which inform farmers about industry trends, new technology, and best practices, limiting their potential to adopt more effective methods.

5. **Increased Input Prices:** Rapid increase in prices of inputs such as seeds, fertilizers and human labour leading to hike in cost of production fetching low returns per rupee of expenditure.

VIII. PROSPECTS OF GROUNDNUT PRODUCTION

The area used for groundnut cultivation in the nation has decreased over time as a result of numerous biotic and abiotic restrictions as well as competition from other crops. In 1996–1997, there were about 7.6 million ha of groundnut-covered land; in 2020–21, there will only be roughly 6.01 million ha. On the other hand, production rose from 7.59 million tonnes in 1996-1997 to 10.24 million tonnes in 2020-21. The largest contributor to the nation's production of edible oilseeds, groundnut, has dropped to third place. It is anticipated that there will be a further decline in groundnut area. India is excessively dependent on imports for edible oil to meet domestic oil demand leading to balance of payments deficit and worsen balance of trade. India has imported 139.74 lakh tonnes of edible oil during first ten months of the oil year 2022-23 (November 2022 to August, 2023) against 110.70 lakh tonnes in the corresponding period of 2021-22, recording a growth of 26.23 per cent (https://www.thehindubusinessline.com/markets/commodities/indias-edible-oil-imports-up-2623-since-november-2022/article67306560.ece). It is expected to reach 160-165 lakh tonnes by the end of 2022-23 oil year (https://economictimes.indiatimes.com/news/economy/foreign-trade/indias-vegetable-oil-imports-up-33-per-cent-in-aug-sea/articleshow/103671409.cms?from=mdr).

It is estimated that (Table 1) out of 437 groundnut growing districts of 15 major states of India, 174 districts are in the category Low Area and High Yield (<50,000 ha area and >1.5 t/ha yield), 9 districts fall in the category of High Area and Low Yield (>50,000 ha area and < 1.5 t/ha yield), 242 districts fall in the category Low Area & Low Yield (<50,000 ha area and <1.5 t/ha yield) and only 12 districts are in the category of High Area & High Yield (>50,000 ha area and >1.5 t/ha yield). Here in these districts, there is a scope for varietal and other technological intervention by the concerned departments/organizations to increase production and yield.

IX. CONCLUSION AND WAY FORWARD

The green revolution has played a significant role in increasing productionof almost food grains but failed to do so in case of oilseeds. Even though central and state governments have taken many measures to tackle the problem of low yields in oilseeds but did not succeed in increasing area under oilseeds and corresponding production. Despite these problems, there is an enormous opportunities to increase domestic production and reduce import of edible oil by developing resilient varieties, promoting sustainable agricultural methods, enhancing infrastructure, bolstering extension services, and giving smallholder farmers access to credit and technology are all part of the multifaceted strategy.

REFERENCES

[1] Anonymous, 2014, Problems and Prospects of Oilseed Production in Madhya Pradesh, 2014. Agro-Economic Research Centre for Madhya Pradesh and Chhattisgarh. *Jawaharlal Nehru Krishi Vishwa* Vidyalaya, Jabalpur *(M.P.)* Study No.111.
[2] Anonymous, 2023, Economic Survey, 2022-23, GoI.
[3] Anonymous, 2023, International Production Assessment Division, Foreign Agricultural Service, United States Department of Agriculture (USDA), https://ipad.fas.usda.gov/cropexplorer/cropview/commodityView.aspx?cropid=2221000.
[4] Anonymous, 2022, State-wise and item-wise value of output from agriculture, forestry and fishing Year: 2011-12 to 2019-20, National Statistical Office, Ministry of Statistics and Programme Implementation, GoI. https://164.100.161.63/sites/default/files/publication_reports/NAD_Rep/Agr_forestry-fishingBrochure%202022.pdf.
[5] Kadiyala, M. D. M, Nedumaran, S., Padmanabhan, J., Murali Krishna, G., Gummadi, S., Srinivas Reddy S., Robertson, R., Whitbread, A., 2021. Modelling the potential impacts of climate change and adaptation strategies on groundnut production in India. *Science of The Total Environment*. 776. https://doi.org/10.1016/j.scitotenv.2021.145996.
[6] Singh, P., Nedumaran, S., Ntare, B. R., Boote, K. J., Singh, N. P., Srinivas, K., Bantilan, M. C. S., 2014. Potential benefits of drought and heat tolerance in groundnut for adaptation to climate change in India and West Africa. *Mitigation and Adaptation Strategies for Global Change*. 19, 509–529.
[7] Prasad, P. V. V., Kakani, V. G., Upadhyaya, H. D., 2009a. Growth and production of groundnut. In: Verheye, W.H. (Ed.), Soils, Plant Growth and Crop Production, *Encyclopedia of Life Support Systems. Eolss Publishers*, Oxford Putto.
[8] Prasad, P. V. V., Staggenborg, S. A., Ristic, Z., 2009b. Impact of drought and heat stress on physiological, growth and yield processes. In: modeling water stress effects on plant growth processes (Eds. L. H. Ahuja and S. A. Saseendran). ASA – CSSA, Madison, WI. *Advances in Agricultural Systems Modeling* 1, 301–355.
[9] Weiss, E. A., 2000. Oilseed Crops. Blackwell Science, London.
[10] https://apeda.gov.in/apedawebsite/SubHead_Products/Ground_Nut.htm
[11] https://www.financialexpress.com/market/commodities-poor-rain-lower-yield-price-hit-groundnut-sowing-in-gujarat-2601925/.
[12] https://www.thehindubusinessline.com/markets/commodities/indias-edible-oil-imports-up-2623-since-november-2022/article67306560.ece.

https://economictimes.indiatimes.com/news/economy/foreign-trade/indias-vegetable-oil-imports-up-33-per-cent-in-aug-sea/articleshow/103671409.cms?from=mdr.

Table 1: Classification of Districts According to Groundnut Area and Yield

Sl. No.	States/UTs	Groundnut growing districts	HALY	LAHY	HAHY	LALY
1.	Andhra Pradesh	13	3	7	0	3
2.	Chhattisgarh	27	0	10	0	17
3.	Gujarat	33	3	22	7	1
4.	Haryana	11	0	0	0	11
5.	Jharkhand	24	0	1	0	23
6.	Karnataka	29	3	2	0	24
7.	Madhya Pradesh	49	0	11	1	37
8.	Maharashtra	34	0	7	0	27
9.	Odisha	30	0	8	0	22
10.	Punjab	2	0	2	0	0
11.	Rajasthan	33	0	23	3	7

12.	Tamil Nadu	31	0	28	1	2
13.	Telangana	31	0	31	0	0
14.	Uttar Pradesh	69	0	4	0	65
15.	West Bengal	21	0	18	0	3
	Total	**437**	**09**	**174**	**12**	**242**

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI.

Note: HALY: High Area & Low Yield (>50,000 ha area and <1.5 t/ha yield);
LAHY: Low Area & High Yield (<50,000 ha area and >1.5 t/ha yield)
HAHY: High Area & High Yield (>50,000 ha area and >1.5 t/ha yield)
LALY: Low Area & Low Yield (<50,000 ha area and <1.5 t/ha yield)

Table 2: Growth and instability in Groundnutarea and production (1996-97 to 2020-21)

	Area		**Production**	
States	**CDVI (%)**	**CAGR (%)**	**CDVI (%)**	**CAGR (%)**
Andhra Pradesh	14.4	-4.24**	38.4	-3.67**
Gujarat	10.7	-0.69*	41.3	3.20*
Karnataka	12.3	-3.19**	29.7	-2.70**
Madhya Pradesh	10.8	0.09	19.6	2.93**
Maharashtra	10.7	-2.90**	16.0	-2.75**
Odisha	17.9	-3.93**	26.5	-1.76*
Rajasthan	22.1	4.97**	30.7	8.84**
Tamil Nadu	15.4	-4.44**	24.6	-0.69
Telangana	14.6	-4.05	19.6	1.30
Uttar Pradesh	12.5	-1.25**	23.4	-0.12
West Bengal	14.3	4.55**	18.7	7.68**
Others	12.3	3.35**	12.5	4.53**
All India	8.1	-1.70**	21.8	1.01

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, GoI.

Note: 1. CDVI= Cuddy-Della Valle Instability Index & CAGR= Compound Annual Growth Rate

2. ** indicate significance at 1 % probability and * indicates significance at 5 % probability

