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Policy Initiatives for enhancing domestic availability of vegetable oils in India

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ABSTRACT

Oilseeds, the backbone of several agricultural economies from classical times assume a prominent role by providing access to nutrition through protein and oil to humans and livestock beside usage in the industrial sector and also a life line for providing livelihood and employment to those involved in the processing sector. The country which evidenced self-sufficiency in oilseeds during early nineties and ultimately gained the status of the world's largest importer, with import of 14.28 million tonnes during 2021-22. e Compound Annual Growth Rates (was used to assess the performance of annual oilseeds during 2000-01 to 2020-21. It was evidenced that the CAGR was positive for all the components. The power of technology operational at the farm level, paved way for sustained production, which is due to the technology outputs from the NAREES/AICRP on oilseeds besides the driving forces initiated by the Government of India. For further reducing import dependency, policy instruments eviz. Seed production, technology assemblage, linkages and convergence, providing incentives, promoting PM-FME.

\ Oilseeds, the backbone of several agricultural economies from classical times assume a prominent role by providing access to nutrition through protein and oil to humans and livestock beside usage in the industrial sector and also a life line for providing livelihood and employment to those involved in the processing sector. Majority of the edible oil comes from these crop enterprises. With its rich agro-ecological diversity, India is indeed blessed to cultivate nine annual oilseed crops. The country which evidenced self-sufficiency in oilseeds christened the "Yellow Revolution" during early nineties of the previous millennium could not be sustained during the present millennium, and ultimately gained the status of the world's largest importer, with import of approximately 14.28 million tonnes, with an exchequer of Rs14153 crore during 2021-22 (Import during the current financial year ending December, 2022 is 10.09 million tonnes an at exchequer of Rs. 11328 crore. (DGCIS, Kolkatta).This suggests that the demand-supply gap of the country's requirements are met through imports causing severe imbalance in the b alance of trade situation of the country.
An attempt is made in this paper to examine the performance of the growth of annual oilseeds in India during the present millennium and suggest appropriate interventions for enhancing the domestic availability of vegetable oils in the country.

METHODOLOGY

The secondary data from published sources (DACNET, DGCIS, and MOPSI) form the Alma matter for the study. The data pertains to the present millennium (2000-01 to 2021-21). The Compound Annual Growth Rates (CAGR) was employed in the present approach to assess the performance of the annual oilseeds crops for the period 2000-01 to 2020-21

Compound Annual Growth Rates (CAGR) was employed to examine the performance of the growth in area, production and productivity of the annual oilseeds (using the exponential time trend equation Y=a Bt. the CAGR is calculated as (e^B-1) X 100 as suggested by Dandekar (1980).

RESULTS AND DISCUSSION

It can be observed from Figure 1 that the CAGR was 2.69, 2.07 and 0.61 per cent for production, yield and area respectively and were significant at one per cent level for the annual oilseed crops.

It can be evidenced that although the CAGR for area was 0.61 per cent indicating mild acceleration in terms of expansion of area under oilseeds, the country evidenced sustenance in the oilseeds production primarily, due to accelerated growth rate evidenced in productivity at 2.07 per cent. In fact, the average production during the the last five years (2016-17 to 2020-21) was 32.68 million tonnes with a sticky area of 26 million hectare suggesting that yield (technology) was the single largest contributor to the production.

It is appreciable to observe that during this period, when the country evidenced rapid strides in the per capita consumption of edible oils which more than doubled (9.5 to 19.4 kg in 2000-01 and 2020-21 respectively), due to a platter of reasons including reduced import duty and tariff structure; changing life styles, ever increasing per capita income, performance of the annual oilseeds sector during this period had showed signs of resilience, although the growth in area was around 0.61 per cent. This suggests, that the power of technology in terms of yield per ha operational at the farm level, paved way for sustained production, which is due to the technology outputs from the NAREES/AICRP on oilseeds besides the driving forcesinitiated by the Government of India to give a boost to the domestic production of annual oilseeds through various schemes initiated and being operationalised.

A snapshot of the Net domestic availability, imports, per capita availability of edible oils is furnished in Table 1 below. In India during the present millenium. It can be

observed from the table that during the last five years ending 2021-22, despite increase in per capita consumption, rise in population, the import dependency has shown of slight decline with quantities hovering around 13-14 million tonnes during the above period.

To keep the momentum of reducing the import dependency through increased domestic availability of vegetable oils in the country, it is imperative that policy instruments are indeed warranted at this juncture to be created / strengthened in this direction. Some of the key policy requirements that require immediate attention increase the farm level productivity based on the study are summarized below:

- Developing a robust mechanism for creation of seed hub in annual oilseeds towards ensuring the timely availability of quality oilseeds to the farming community is very important and essential. The private players should be involved in seed production and in the seed chain of the oilseed crops.
- Convergence / Multi-Institutional approach of both public and private in technology assemblage and output marketing
- Linkages and strengthening the FPO's with end to end solutions
- Incentives for cultivation of oilseeds towards diversification
- Special purpose vehicle for giving fillip to oilseeds in Bundelkhand and North Eastern Region
- Favourable policy ecosystem for startups/ entrepreneurs in value chain of oilseeds
- Emphasis on promoting Micro Food Processing Entreprises (PM-FME) under the Atmanirbhar Bharat Abhiyan.

CONCLUSIONS

It can be concluded that the acceleration in the growth rate of productivity enabled for sustained production of annual oilseed in India during this millennium. Signs of reduced import dependency evidenced during the last five years is to be geared up for further reducing dependency through policy instruments encompassing seed production, technology assemblage, linkages and convergence, providing incentives, promoting PM-FME.

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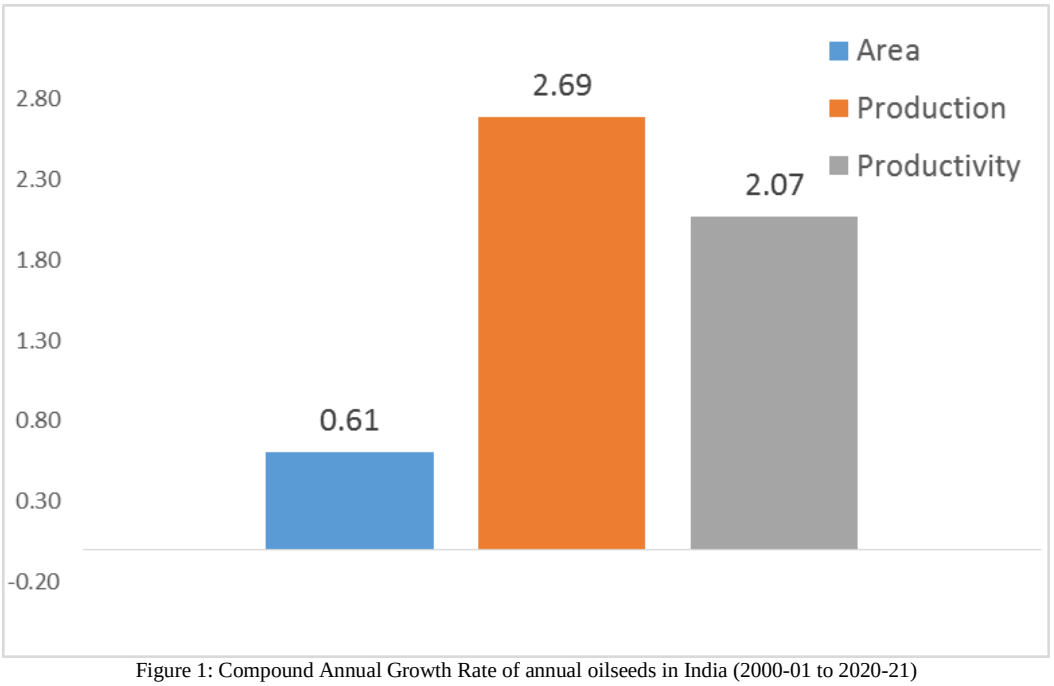

Figure 1: Compound Annual Growth Rate of annual oilseeds in India (2000-01 to 2020-21)

Table: Net domestic availability, imports, per capita availability of edible oils in India

Year	Population (billion)	Net domestic availability (mill. tonnes)	Import of edible oils (mill. tonnes)	Total Consumption (mill. tonnes)	Import Dependency (%)	Per Cap. Availabilty (kg/annum)
2000-01	1.06	5.5	4.18	9.68	40	8.2
2005-06	1.15	8.32	4.29	12.6	34	10.6
2010-11	1.23	9.78	7.24	17	43	13
2015-16	1.31	8.64	14.85	23.5	63	17.7
2016-17	1.32	10.1	15.32	25.4	60	18.2
2017-18	1.34	10.38	14.59	24.8	59	19.5
2018-19	1.35	10.35	15.57	25.92	60	18.1
2019-20	1.37	10.66	13.42	24.08	56	19.2
2020-21	1.39	11.16	13.45	24.61	55	19.7
2021-22	1.4	11.44	14.28	25.72	55	19.9

Fatty acid profiling of dark brown sesame (*Sesamum indicum* L.)

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ABSTRACT

Sesame is considered to be the oldest of oilseed crops having chemical composition of 42-63% oil, 22-25% protein, 13.5% carbohydrate and 5% ash. The fatty acid content of sesame oil contains oleic acid (43%), linoleic acid (35%), palmitic acid (11%) and stearic acid (7%) contributing towards 96% of total fatty acid. The present investigation was carried out to study the total fatty acids composition in 200 sesame accessions. Results revealed that certain amount of variation has been observed among the accessions for oil content and fatty acid composition in the accessions.

Keywords: Fatty acid, Oil content, Oleic acid, Linoleic acid, Sesame

Sesame is considered to be the oldest of oilseed crops. Bedigian (1981) suggested that Africa is the primary centre of origin, due to its broad genetic diversity, while India is considered to be the secondary centre due to its huge production of sesame seeds. Being a short-duration crop is suitable for multiple cropping system as a catch crop or sequence crop. Sesame seeds are small in size, ovate in shape, slightly flattened with a smooth surface and a vital source of different nutritional elements *i.e.,* Iron (Fe), Magnesium (Mg), Copper (Cu) and Calcium (Ca) and some important vitamins *viz.,* B1 (Thiamine) and E (Tocopherol). This oil is used in the pharmaceutical industry and ayurvedic preparations because of its medicinal properties.

Most of the researchers observed that lignans i.e., sesamin and sesaminol found in sesame seeds have an extraordinary antioxidant effect on the human body. Sesame oil has some oxidative stability and oxidative activity because of lignans (Wu, 2007). Besides a source of edible oil, sesame seeds have enormous significance in the food industry because of the flavor and stability of the oil. The fatty acid content of sesame oil contains oleic acid (43%), linoleic acid (35%), palmitic acid (11%) and stearic acid (7%) contributing towards 96% of total fatty acid (Elleuch et al., 2007). Keeping the above facts in view, the present experiment was formulated to carry out the study of total fatty acids composition in 200 sesame accessions.

MATRIALS AND METHODS

The present experiment was conducted to evaluate two hundred dark brown sesame (*Sesamum indicum* L.) accessions collected from Project Co-ordinating unit (AICRP on Sesame & Niger) for oil content and fatty acid composition. Oil content was determined by Soxhlet procedure and the fatty acid composition i.e., Oleic acid, Linoleic acid, Lionlenic acid, Palmitic acid and Stearic acid were determined by Gas chromatography.

RESULTS AND DISCUSSION

The experimental results revealed that certain amount of variation has been observed among the accessions for oil content and fatty acid composition. The Oil content ranged from 22.09% to 52.63% with average value of 42.10%. The accessions EC-334960 (52.63%), SI-995 (51.36%), G-41 (51.24%), EC-334994 (51.07%), EC-334992 (50.96%), IS-321 (50.89%), S-0481 (50.43%), ES-75 (50.39%), G-2 (50.11%), SI-1033 (50.05%), ES-75-4-84 (50.01%) were identified as promising accessions for oil content. Similar results were observed by Thakur et al.