

Indian marketing and exports of potato and its processed products

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Potato is the predominant vegetable crop in India contributing around 28% of total vegetable production. India is the second largest potato producer in the world, accounting for about 15% of global potato production. Presently, the total export of potatoes, seed potatoes and potato products from the country is only about 1.05% of the total potato production; however, the export volume has grown at an encouraging CAGR of 14.1% over the past two decades. This article discusses the Indian potato marketing systems, their constraints, and measures to improve them. It also deals with the status, growth and potential of exports of potato and its products from India.

Keywords: Exports, Marketing, Potato, Processed products

THE potato (*Solanum tuberosum* L.) is the world's most important vegetable crop and third important food crop, after rice and wheat. In 2008, the FAO designated the potato as the crop to address future global food security and poverty alleviation due to its potential as a nutrient-rich crop and its ability to improve the livelihood of farmers. It is a highly voluminous crop and labour-intensive for its cultivation. Besides, processing, storage, transportation, and marketing of fresh and processed potatoes offer huge employment opportunities. Thus, nutrient-rich and labour-oriented crops like potato play a crucial role in both employment generation and ensuring food and nutritional security in developing countries like India.

As per the FAOSTAT data for the year 2022, India ranks second in worldwide potato production with 56.18 million tonnes from a 2.23 million ha area. This places India behind China, with India accounting for over 15% of the global potato production. It is the predominant vegetable crop in India, accounting for nearly 20.62% of the potato area and 28.30% of

total vegetable production during 2022–23. According to FAOSTAT, India's per capita consumption of potatoes in 2021 was 25.35 kg/capita/year, which remains low when compared to other countries. For example, in Belarus, Ukraine, and Kyrgyzstan, per capita potato consumption is as high as 155.43 kg, 130 kg, and 124 kg, respectively. However, potato consumption in India has steadily increased over time, from a meagre 3.93 kg/capita/year in 1961 to 25.35 kg/capita/year in 2021, with a compound annual growth rate (CAGR) of 3.4% (Fig. 1).

Potato farmers often experienced market gluts and lower prices due to bumper production in major producing states such as Uttar Pradesh, West Bengal, and Punjab. Although India has made tremendous progress in potato production, the country is not yet prepared to absorb the excess potato production. In addition to marketing, post-harvest loss is another problem in potato production in India. To meet demand, India will need to grow 125 million tonnes of potatoes and 25 million tonnes of processing quality potatoes in 2050 due to population growth, increasing

urbanization, lifestyle changes and economic changes. Presently, India has surplus potatoes and does not face any issues with potato production; however, researchers and policy planners should focus on processing, marketing, and export strategies to augment farmers' income and realize the demand of the burgeoning population in the country.

Potato marketing system

Conventional system (APMC act): Agricultural marketing in India is predominantly governed by Agricultural Produce Market Committees (APMCs), that operate within designated market areas known as *mandis*. These *mandis* serve as platforms for the purchase and sale of agricultural commodities. Potatoes are often transported to wholesale markets through a complex chain of intermediaries that includes field aggregators/assemblers, forwarding agents, commission agents, wholesalers and retailers, before being distributed to consuming markets or centres. The marketing of potatoes is complex in its operations and involves a wide range of functions like

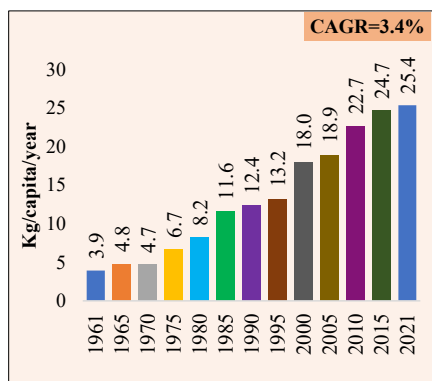


Fig. 1. Per capita potato consumption in India (Source: FAOSTAT)

assembling, processing, storage, grading, packaging, transportation, wholesaling and retailing.

Assembling of produce:

Assembling is the initial stage in the marketing process which entails gathering potatoes from several small farms spread out across vast regions and consolidating them for later distribution in huge quantities. The actors involved in this process include producers, village merchants, itinerant merchants, wholesale merchants, commission agents, producers' organizations, co-operatives, and other relevant parties. The primary assembly markets are situated in Uttar Pradesh, Punjab and West Bengal. Gujarat is a prominent hub for the assembling of processed potatoes, particularly for the manufacturing of French fries.

Grading and standardization:

Grading helps the potato producer and seller determine the price and widen the avenue for potato export. Based on the preferences of consumers, potatoes can be graded in different lots according to their inherent qualities, such as size of tubers, colour, shapes, etc. The grading of potato tubers is done both by hand and by graders. AGMARK specification plays an important role in ensuring the quality of potatoes for marketing and exporting. AGMARK provides grade specifications for various exportable agriculture products, including potato.

Packaging: The graded potatoes are packed in jute bags, leno bags and net bags before transportation or storage. APEDA provides the

packaging specifications for exports of potato and its products.

Transportation: The packaged potatoes have to be transported to the point where they are in actual demand. Tractor trolley, trucks and railway transport are primarily used for transportation of potato produce. Bullock and camel carts are also used as the modes of transportation in rural areas.

Storage: Potatoes are stored in cold storage for seed, table and processing purposes. It is recommended that cold storage facilities maintained at a temperature range of 2-4°C be exclusively utilized for storing seed potatoes. Table and processing potatoes should be stored at a temperature range of 8-12°C after treatment with a sprout suppressant. For low-cost and short-term storage of table and processing potatoes, non-refrigerated storage methods such as evaporative-cooled potato stores and traditional on-farm storage methods like heaps and pits are effective.

Processing: Potatoes can be processed into different products like French fries, potato chips, potato wafers, flakes, granules, flour, starch, potato custard, powder soup, potato biscuits, potato cakes, and many more. The ICAR-Central Potato Research Institute (CPRI), Shimla, has developed varieties suitable for processing, like Kufri Chipsona-1, Kufri Chipsona-3, Kufri Chipsona-5, etc. for processing potato chips, and Kufri Frysona and Kufri FryoM for making French fries. There are also other exotic processing varieties in India, like Santana, Lady Rosetta, Atlantic and other varieties.

Wholesaling and Retailing: Wholesalers and retailers are responsible for making potatoes accessible to end users. They serve as the final link in the potato marketing process and play a crucial part in the entire process.

Alternative Marketing System

Direct Marketing: Direct marketing enables farmers to sell their produce directly to consumers without the involvement of middlemen, thereby making

farmers in charge of selling their produce. Successful direct agricultural marketing models like *Apni Mandis* in Punjab and Haryana, *Rythu Bazaars* in Andhra Pradesh and *Uzhavar Santhaigal* in Tamil Nadu, have enabled farmers to get better prices as well as enhanced the consumers' satisfaction.

Contract farming: Contract marketing is a system in which the commodity is marketed by farmers under a pre-agreed buy-back contract with an agency engaged in trading or processing. Contract farming provides many advantages to the farmers, such as an assured price and market, credit, technologies, inputs, extension services, risk sharing, employment generation and reducing the cost of production and transactions. PepsiCo (India), McCain (India), ITC Limited, Iscon Balaji Foods Limited are some of the big companies involved in potato contract farming in India.

Collective marketing: Collective marketing in India is basically a system where a group of farmers aggregate their farm produce to enhance their bargaining power and obtain better prices. Collective marketing through farmer organizations, cooperatives, associations, and other related groups of farmers helps their member farmers, especially marginal and small farmers, sell their produce in bulk at a higher price than when sold individually.

e-National Agriculture Market (e-NAM): The National Agriculture Market (NAM) is a pan-India electronic trading portal that networks the existing APMC *mandis* to create a unified national market for agricultural commodities. The NAM Portal provides a single window service for all APMC-related information and services. This includes commodity arrivals and prices, buy and sell trade offers, and provisions to respond to trade offers, among other services.

Major constraints in potato marketing

- Market gluts and wide price fluctuations result in a crash in commodity prices and distress sales by farmers.

- A large number of intermediaries exist in potato marketing channels.
- Lack of basic marketing facilities in rural markets, like cold stores, transportation and other related facilities.
- There is a lack of robust market intelligence or information systems in India.

Measures to improve potato marketing

Some important measures or ways to improve the efficiency of potato marketing are:

- Encourage collective marketing through FPOs, cooperatives, associations and other related groups.
- Adoption of direct marketing and contract farming.
- Production of processing and specialty potatoes.
- Processing and exports of potato and its products.
- Mass adoption of e-NAM services.
- Establishment and upgrading of cold storage, especially in rural areas.

Total exports

The total export of potatoes, seed potatoes and their products from India has increased over the years (Table 1). Based on the data collected from APEDA and the World Bank, the total export of potato and its products was about 5.59 lakh tonnes during the triennium average ending (TE) 2022–23, which is about 1.05% of the total potato production (~530 lakh tonnes) during the same TE period. While India's potato export share in the world market may be disappointing, the growth rate at a CAGR of 14.1% from 2003 to 2022 in the world makes the whole scenario optimistic. There are increasing trends in the export quantity of potatoes and its products, except for potato seeds and frozen steamed or boiled potatoes, which have negative growth rates. The export value of India's total export of potatoes and potato products was about ₹14.56 billion during the TE 2022–23. India reaches a record high of over ₹20 billion in the total export value in the year 2022–23.

Exports of potatoes and seed potatoes

India exports about 4.02 lakh tonnes of fresh potatoes, which account for about 72% of the overall export volume (Table 1). However, this only represents 0.76% of the total potato production during TE 2022–23. The export of potatoes generates approximately ₹6.53 billion, accounting for approximately 44.82% of the overall value of exports. The volume of exports has grown at a healthy CAGR of 11.8% during the last two decades. Based on the export volume during TE 2022–23, Nepal, Oman, Saudi Arabia, Indonesia, Malaysia, Vietnam, UAE and Maldives are among the major importing countries for potatoes.

Potato seed export performance is disappointing, with a negative CAGR of -15.2%. Two decades ago, India used to export about 5233.71 tonnes of seed potatoes, which has now declined to only about 351.15 tonnes. India should consider the preferences of destination countries

when developing and exporting potato varieties. The major importers include Nepal, Bhutan, Senegal, New Zealand, Hong Kong, UAE, Belgium and Canada.

Exports of processed potato products

India is emerging as a prominent player in the global export of potato products, with its industry experiencing rapid growth. During TE 2005–06, the total export volume of potato products was only 7295.00 tonnes, but presently (TE 2022–23) it has risen to about 1.56 lakh tonnes, accounting for about 54.82% of the total export value. The overall CAGR of the export volume of potato products is growing at 15.4% from 2003 to 2022.

Prepared/preserved potatoes, frozen: The export of frozen prepared/preserved potatoes (mostly French fries) is growing at the fastest rate with a CAGR of 35.7% and is expected to expand

Table 1. Exports of potatoes, seed potatoes and processed potato products

Items with ITC-HS codes in brackets	TE 2005–06		TE 2022–23		CAGR of export volume (2003–22)
	Quantity (tonnes)	Value (Million ₹)	Quantity (tonnes)	Value (Million ₹)	
Potatoes, fresh/chilled (07019000)	69423.47 (84.71)	327.89 (68.66)	401801.88 (71.92)	6528.15 (44.82)	11.8
Potato seeds, fresh/chilled (07011000)	5233.71 (6.39)	42.03 (8.80)	351.15 (0.06)	51.90 (0.36)	-15.2
Prepared/preserved potatoes, frozen (20041000)	483.08 (0.59)	19.78 (4.14)	67770.56 (12.13)	5336.37 (36.64)	35.7
Potatoes, dried (07129060)	683.22 (0.83)	11.81 (2.47)	48977.65 (8.77)	586.39 (4.03)	17.1
Potatoes, uncooked/cooked by steaming/boiling in water, frozen (07101000)	4565.85 (5.57)	35.26 (7.38)	24164.65 (4.33)	426.71 (2.93)	-0.9
Flakes, granules and pellets of potatoes (11052000)	93.80 (0.11)	3.19 (0.67)	10583.05 (1.89)	1213.30 (8.33)	27.8
Potato starch (11081300)	71.89 (0.09)	1.96 (0.41)	2161.81 (0.39)	122.15 (0.84)	17.6
Flour, meal and powder of potatoes (11051000)	950.27 (1.16)	14.60 (3.06)	2049.62 (0.37)	97.27 (0.67)	6.4
Prepared/preserved potatoes, not frozen (20052000)	446.88 (0.55)	21.05 (4.41)	799.03 (0.14)	202.97 (1.39)	12.4
Exports of processed products	7295.00 (8.90)	107.65 (22.54)	156506.36 (28.01)	7985.16 (54.82)	15.4
Overall exports	81952.18 (100.00)	477.57 (100.00)	558659.39 (100)	14565.22 (100)	12.1

Note: ITC-HS Code = Indian Trade Classification's Harmonized System Codes; the figures in parentheses are the percentages of the total export volume and value of the respective items; TE = triennium average ending; CAGR = Compounded Annual Growth Rate for the period 2003–22. Data Sources: APEDA, World Bank

in the future. This is followed by the exports of flakes, granules, and pellets of potatoes (CAGR = 27.8%) and flour, meal, and powder (CAGR = 17.6%). Frozen potatoes are the leading products, worth about ₹5.35 billion, i.e., about 36.64% of the total export value from the export of 67770.56 tonnes (12.13% of total export volume) during TE 2022–23. Back in TE 2005-06, India used to export only about 483 tonnes of frozen potatoes. The major importing countries of frozen potatoes from India are the Philippines, Thailand, Indonesia, Vietnam, South Korea and Malaysia.

Gujarat has played a significant role in India's exports of French fries, helping the country become a French fry exporter rather than an importer. Despite producing only about 6.70% of total potato production, it has become the country's largest exporter of French fries. The state has an investment-friendly environment and houses some of the leading food producing companies like McCain Foods, Iscon Balaji Foods and HyFun Foods.

Flakes, granules and pellets of potatoes: Potato flakes, granules and pellets ranked second in terms of export value, generating around ₹1.21 billion (8.33%) during TE 2022–23 from an export volume of about 10583.05 tonnes (1.89%). The export volume of this category has

the second highest growth rate, with a CAGR of 27.8%. Malaysia, Japan, Philippines, Indonesia, Israel, Thailand, Vietnam, USA and Australia are major importers.

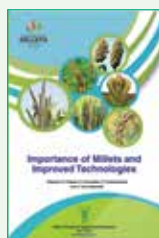
Dried potatoes: The dried potato category (dried, unprepared chips, wafers, and other similar products) accounts for about 8.77% (~49000 tonnes) of total export and 4.03% (₹586.39 million) of total export value. The primary importers include USA, Nepal, Germany, Australia, UAE, United Kingdom and Hong Kong.

Steamed/boiled potatoes, frozen: Steamed/boiled potatoes (mini potato, baby potato, etc.) account for about 4.33% of the total potato export quantity and 2.93% of the total value. However, the CAGR of this product has declined to about -0.9% during the last two decades. India primarily exported steamed or boiled potatoes to USA, Nepal, UAE, Japan, Sri Lanka, Australia, Maldives and Canada.

Other processed products: The exports of other processed products like potato starch, flour, meal and powder of potatoes and prepared or preserved potatoes (not frozen) also show great potential for export in the future, and they have been growing at a positive CAGR over the last two decades (Table 1).

Although India is the second largest producer of potatoes, its export performance is quite dismal, with only about 1% of total potato production being exported as potatoes, seed potatoes and processed products. Nevertheless, the growth rate with a CAGR of about 14% during the last two decades, presents an overall promising outlook. India has immense processing and export potential for potatoes due to huge surplus and year-round potato production, diverse agro-climatic conditions, the availability of some of the best processing varieties, strong R&D infrastructure support and the availability of cheap labour in the country. ICAR-CPRI is actively working to promote the processing and export of potatoes and their products. The processing technologies are already in place and about 20 exportable potato varieties have been identified and promoted by the institute. Given the current surplus of potatoes in the country, it is imperative for policymakers to focus on the development of marketing, processing and export strategies. This will help to address marketing issues such as price fluctuations and market gluts, increase producers' income, and meet the future demand of the growing population.

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