Sustainability in Agriculture Sector and Trade

Snigdha Bhatia, Dr.R.K.Arya

ABSTRACT

Sustainability in Agricultural sector can enhance the productivity in agricultural sector and facilitate trade. It has been observed in the past, that though India became food sufficient, still people dependent on it are not sufficiently empowered. The mis-use of resources appear to be taking place. Sustainability in Agricultural sector means the efficient use of resources which means right application of inputs vis-à-vis water, fertilizer, using of appropriate technology, green manure and just the required deployment of manpower. With use of sustainable agricultural practices, which are efficient and not harmful for environment, agricultural sector will be better prepared to cater to the needs of the world. In Indian context, sustainability in agricultural sector would bring stability in environment and increase productivity and create surpluses which can then be exported. Hence, facilitating trade and enhancing economic status of India. Being the largest employer of workforce, the agricultural sector experienced a buoyant growth in the past two years even when there was COVID pandemic slowing down all economic activities across the world. In 2020-21, the agricultural sector recorded the growth of 3.6 percent and in 2021-22, 3.9 percent. Agricultural sector contributed to 18.8 percent in Gross Value Added (GVA) in 2021-22. The growth in this sector can be attributed growth on allied sectors i.e. fisheries, livestock, and dairy which contributed the most. This research paper will discuss how government is facilitating sustainability and trade in agricultural sector which has immense potential yet to be achieved.

INTRODUCTION

Sustainable Development was first mention in US legislation in 1985 and it started gaining prominence all over the world since then. In India, **National Action Plan on Climate Change (NAPCC)** outlined eight missions, out of which one of them was **National Mission for Sustainable Agriculture (NMSA)**. NMSA focused on encouraging farmers to use sustainable agricultural by using different appropriate strategies. Even the 12th Five Year Plan aimed to include these strategies into mainstream missions/schemes/programmes of Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) through convergence and restructuring processes. It was a scheduled intervention to make agriculture more sustainable, productive and remunerative and resilient to climate changes by encouraging composite/integrated systems of farming which were location specific. It aimed at management of soil health and conservation of soil moisture, practices which required efficient management of water and also focus on mainstreaming the rainfed technologies. It also aimed to promote sustainable agriculture through various other measures which adapted better to climate changes. The major focus of NMSA was also to increase productivity of

rainfed areas using collaborating conservation of resources, management of soil health and integrated agriculture. There were two types of schemes under NMSA:

Centrally Sponsored Schemes:	**Central Sector Schemes:**
Rainfed Area Development (RAD)	Soil and Land Use Survey of India (SLUSI)
Sub Mission on Agro Forestry (SMAF)	National Rainfed Area Authority (NRAA)
National Bamboo Mission (NBM)	Mission Organic Value Chain Development in North Eastern Region (MOVCDNER)
Soil Health Management (SHM)	National Centre of Organic Farming (NCOF)
Paramparagat Krishi Vikas Yojana (PKVY)	Central Fertilizer Quality Control and Training Institute (CFQC&TI)

National Mission for Sustainable Agriculture (NMSA) was initiated in 2014-15 in India which defined sustainable development in context of India and identified various dimensions under it. Sustainable Agricultural looked like a promising way of farming given the current scenario of extreme climate change (result in events like floods, frequent and acute droughts and locust attacks). For example, in 2018 when there was Titli and Pethai cyclones in Andhra Pradesh, crops cultivated in conventional way showed less resilience to heavy winds and storm as compared to crops which were cultivated through natural farming. Even after understanding the importance of sustainable agricultural, it still doesn't have its strong presence at pan-India level. There are so many unanswered questions related to sustainable agricultural, for example, what practices are used under sustainable agriculture, how many farmers adopted these practices and in which parts of India, its impact on farmer's income and well-being, other social and environmental impacts. Since less research is done in this field and there are still many research gaps, that's why many policymakers, philanthropic organisations and administrators show keen interest in this area so that they can make well informed decisions backed by evidence and knowledge to scale up appropriate sustainable agricultural activities in India.

Sustainable Agricultural is a dynamic concept which includes many variations in terms of definition and practice. There are more than 70 definitions of sustainable agricultural as per the literature review. Multiple terms are used to refer to sustainable agriculture concept. The most widely used term is organic farming, followed by other terms like sustainable agricultural, agroecology, natural farming and finally regenerative agricultural (as per the google search trend for last 15 years). Though these are related concepts but they do have individual definitions, practices and philosophy.

There are total 30 **Sustainable Agricultural Practices (SAP's)** in India. When the focus is only one aspect of agricultural, then it is called Practice, whereas when there are combined in one way or the other for holistic approach, which may have two or more aspects, then it is called a System. Hence, collectively it is referred to as **Sustainable Agricultural Practices and Systems (SAPS's)**. This list of these practices and systems are given below.

Sustainable agriculture practices and systems (SAPSs)	
System	Practice
Permaculture*	Vermicompost*
Organic farming*	Drip irrigation/sprinkler*
Natural farming*	Crop rotation*
System of rice intensification (SRI) *	Intercropping*
Biodynamic agriculture*	Cover crops*
Conservation agriculture*	Mulching*
Integrated farming system (IFS) *	Contour farming*
Agroforestry*	Rainwater harvesting-artificial recharge of groundwater *
Integrated pest management (IPM) *	Floating farming*
Precision farming*	Plastic mulching
Silvipastoral systems	Shade net house
Vertical farming	Alternative wet and drying technique (for rice)
Hydroponics/Aeroponics	Saguna rice technique
Crop-livestock-fisheries farming system	Farm pond lined with plastic film
	Direct seeding of rice
	Canopy management
	Mangrove and non-mangrove bio-shields

It's shocking to observe that only 4 percent farmers (i.e.5 million) using these SAPS's and that it's far from the mainstream agricultural practices of India. The most popular among these is **Crop Rotation**[1] which is being used by 15 million farmers and covering the area of 30 million hectares, its one of the elementary SAPS's. Special attention was given to **Rainwater Harvesting**[2] and **Agroforestry**[3] which also had higher area coverage. It was observed that agroforestry was used mostly by large cultivators since it covers larger areas. **Mulching** conserve the nutrients and moisture of soil and avoid soil erosion. It is practise of adding undecomposed natural materials like hay, straw or other plant residues or artificial materials like plastic sheets to cover the soil surface. It is rather limited according to the documented sources, however, the stakeholders informed that it is covering around 20 million hectares. **Precision farming**[4] can be done over the area where is **micro irrigation**[5] and it covered around 9 million hectares. **National Mission of Micro Irrigation** has been remarkably promoting the micro irrigation techniques across the country over the years. However, **Integrated Pest Management** is being promoted for decades in India but it still has low coverage of only 5 million hectares. Western and southern regions of India use **Intercropping[6] method**, which is around one-million hectare in total. Due to lack of reliable data, intercropping areas in cultivation of horticultural crops are not included in this figure mentioned above.

Various Government Policies supported **Organic Farming** immensely, still only two percent of the total Indian net sown area is under organic farming (ie. Around 140 million hectares only) There are only about two million certified producers for organic products. All the others are uncertified and unfortunately there is no reliable source of data for these uncertified organic farmers. **Biodynamic agriculture** is one of aspect of organic farming in which biodynamic inputs (replacement of chemical fertilizer with micro biological nutrient

[1] Crop Rotation: is a system of cultivating different crops in recurrent succession on the same land.
[2] Rainwater Harvesting: collecting and storing the rain water in a reservoir, instead of allowing it to run-off.
[3] Agroforestry: Agriculture technique of incorporating the growing of trees.
[4] Precision Farming: includes the use of information technology (IT) in farm management so that crop and soil exactly what they need for their optimum health and productivity.
[5] Micro irrigation: modern method of irrigation in which water is delivered slowly.
[6] Intercropping: growing two or more crops in proximity; usually in space between rows.

like bacteria, fungi or algae) are used along them organic farming practices. The biodynamic farming has an estimated area coverage of around 0.1 million hectares only. **Natural Farming**[7] has gained a lot of popularity in the last three years. It is mostly used in the following states: Andhra Pradesh, Maharashtra, Karnataka and Himachal Pradesh. It covers around 0.7 million hectares of area and around one million small and marginal farmers have adopted it. The **System of Rice Intensification (SRI)**[8] has also gained a lot of importance and is rapidly adopted across the country, specially in the last five years. It covered an estimated area of 3 million hectares. Lastly, Partial **Conservation Agriculture (CA)**[9] covered around 2 million hectares which were adopted by states in Indo-Gangetic Plains (IGPs).

The complex structure of sustainable agricultural seemed to be the most efficient way of farming in the future, since India is trying to achieve its targets related to trade, sustainable farming seems to play a crucial role in making India achieve these goals and targets. In the next section, the current scenario of agricultural trade, export-import policy is being discussed. Further, the role of sustainable development in facilitating trade will be highlighted by this paper.

Promotion of Agricultural Trade and Role of Sustainable Development

Agriculture Trade Policy, Promotion, and Logistics Development Division is responsible for taking all policy decisions related to exports, imports and logistics development and is also given the additional responsibility of boosting international trade of agricultural commodities. It coordinates with World Trade Organisation's (WTO) Agreement of Agricultural (AOA) regarding formulating policy and responses, sorts out all matters related to Free Trade Agreements and Preferential Trade Agreements (FTA's/PTA's) and issues of logistics with Department of Commerce (DOC), further looks into FDI in agriculture with Department of Promotion of Industry and Internal Trade (DPIIT), and lastly, manages and modifies as when required the Custom Duty and Goods and Services Tax (GST) on agricultural goods with the Department of Revenue (DOR). This Division is the one to control all trade activities and management of agricultural sector internally within country.

Agricultural Exports

With increase in agricultural exports, farmers were benefitted due to access to larger markets which now included international markets also, this is encouraged them immensely. Rice, species, cotton, cashew and sugar etc were exported in greater quantities and thus, there was increase in their production in terms of area coverage and growth rate of production. The share of Indian agricultural exports in the total global agricultural trade was 2.15% and similarly, share of Indian agricultural imports in the total global agricultural trade was 1.54%, as per the WTO statistics in 2018.

[7] Natural Farming: chemical free, traditional way of farming. Reduces externally purchased inputs and promote indigenous practices.

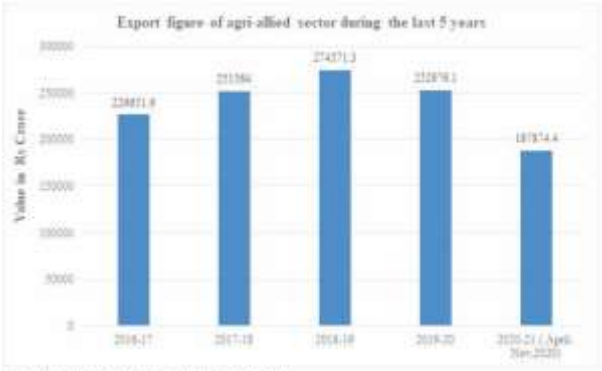
[8] The System of Rice Intensification: farming methodology aimed at increasing rice yield using low water, labour intensive technique which uses younger seedings singly spaced and hand weeded with special tools and using of organic manure.

[9] Conservation Agriculture: includes 3 principles of CA, minimum mechanical soil disturbance, permanent soil organic cover, species diversification. It's a farming system to prevent losses in arable land and regenerating degraded land.

Agricultural exports share as the percentage of agricultural GDP reduced from 9.9% (in 2018-19) to 8.3% (in 2019-20) and similarly, for imports as the percentage of agricultural GDP it reduced from 4.9% to 4.8% during the same period. The agricultural exports share in total merchandise exports from India had risen from 10.9% (2019-20) to 14.4% in (2020-21), during the period of same months from April to November. The agricultural and allied exports increase by 15.87% (i.e. to Rs.1,87,874.42 crores) in 2020-21 as compared to 2019-20. This increase can be attributed to increase in exports of goods like spices (8%), fresh vegetables (12%), basmati rice (13%), oil meals (32%), sugar (72%), rice (not including basmati) (118%) and finally raw cotton (140%), which experienced higher growth as compared to previous year.

The main destinations of exports of agricultural and allied good from India are the United States of America, UAE, UK, Saudi Arabia, China, Netherlands, Japan, Iran, Bangladesh, Pakistan, Nepal, Vietnam, Malaysia, Thailand and Indonesia.

Below is the graph showing value of exports of agricultural and allied products over the years.



Source: Department of Commerce, Government of India.

Table: Top 10 Commodities exported by India. (Year Wise)

[Value in Rs. Crores, Quantity in '000' Tonnes]

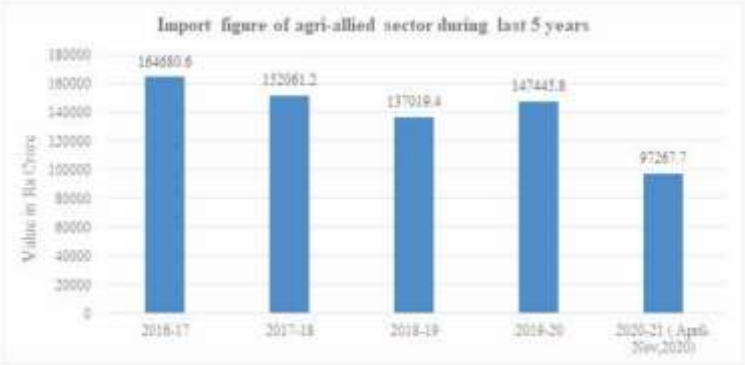
S. No.	Commodity	2016-17		2017-18		2018-19		2019-20		2020-21 (Upto Nov-20)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
1	RICE -BASMOTI	3985.2	21512.9	4056.9	26870.7	4414.6	32804.3	4454.8	31026.3	3047.5	20026.7
2	RICE(OTHER THAN BASMOTI)	6770.8	16929.9	8818.5	23437.2	7648.0	21171.2	5056.3	14400.3	7025.1	19779.8
3	SPICES	1014.5	19111.3	1096.3	20084.9	1133.9	23217.8	1193.4	25642.0	1021.7	19093.8
4	BUFFALO MEAT	1323.6	26161.4	1350.3	26035.2	1233.4	25091.4	1152.3	22661.1	705.2	15489.2
5	SUGAR	2544.0	8659.5	1757.9	5225.6	3989.7	9523.1	5798.5	13981.6	4569.8	12121.4
6	COTTON RAW INCLD. WASTE	996.1	10907.3	1101.5	12200.1	1143.1	14627.6	657.8	7539.5	597.3	6085.5
7	OIL MEALS	2632.3	5410.1	3570.8	7043.2	4493.3	10557.5	2655.8	5861.4	2190.9	5241.6
8	CASTOR OIL	599.2	4521.5	697.1	6730.0	619.4	6170.1	593.9	6323.8	485.7	4367.7
9	FRESH VEGETABLES	3404.1	5790.7	2448.0	5297.7	3192.5	5679.1	1930.5	4617.3	1772.7	3826.7
10	MISC PROCESSED ITEMS	0.0	3053.8	0.0	3549.0	0.0	4613.4	0.0	4586.8	0.0	3769.3
	Total Agri & Allied Exports	**226651.9**		**251564.0**		**274571.3**		**252976.1**		**187874.4**	

Source: Department of Commerce, Government of India

Agricultural Imports

The imports of agricultural and allied products reduced by -3.55% (i.e. Rs. 97267.66 crore) in 2020-21 (April to November) as compared to the previous year. This decrease can be attributed less imports of the following goods: pulses (-6.5), cashew (-15.7), spices (-33.6),

raw cotton including waste (-79) etc. The share of agricultural and allied activities imports rose form 4.4% (in April-Nov 2019-20) to 5.9% (April-Nov 2020-21) as the share of total merchanise imports reduced significantly. The countries from which agricultural and allied goods are imported are USA, UAE, Australia, Argentina, Brazil, China, Thailand, Indonesia, Singapore, Myanmar, Afghanistan, Vietnam, Ukraine, Malaysia and lastly, Cote d'lvoire. The graph below shows the value of imports of agricultural and allied activites over the years.



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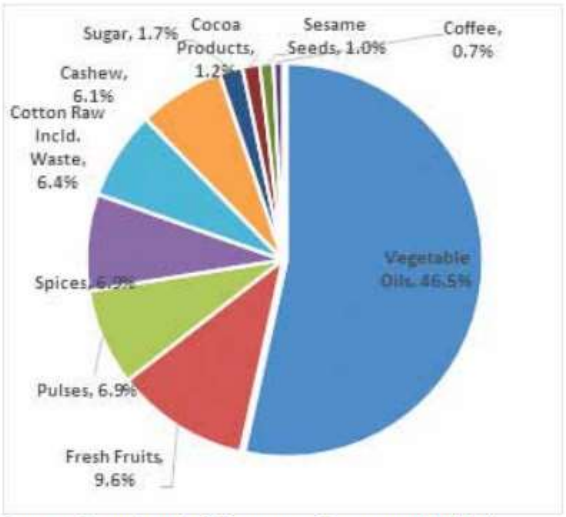
S. No.	Commodity	2016-17		2017-18		2018-19		2019-20		2020-21 (Upto Nov-20)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
1	VEGETABLE OILS	14009.9	73047.7	15361.0	74995.9	15019.3	69023.8	14722.1	68558.2	9272.6	50517.0
2	FRESH FRUITS	1040.2	11241.0	994.7	12524.6	1124.2	13931.7	993.7	14137.1	637.3	9471.4
3	PULSES	6609.0	28523.9	5607.5	18748.6	2527.9	8035.3	2898.1	10221.4	1532.3	7148.4
4	CASHEW	774.3	9027.1	654.0	9134.3	839.6	11162.3	941.4	9026.3	668.8	5898.8
5	SPICES	240.4	5757.8	222.3	6385.3	240.6	7932.7	320.9	10186.9	218.3	4952.0
6	SUGAR	2146.2	6868.6	2403.0	6035.8	1490.6	3175.4	1117.7	2473.2	1507.3	3530.5
7	ALCOHOLIC BEVERAGES		3581.1		3876.1		4678.7		4643.5	0.0	2551.1
8	COTTON RAW INCLD. WASTE	498.7	6337.4	469.1	6306.8	299.3	4383.4	744.3	9371.2	143.1	1705.4
9	OTHER OIL SEEDS	117.2	394.8	127.4	364.6	220.5	745.4	410.9	1527.8	353.3	1538.2
10	MISC PROCESSED ITEMS		2116.2		2249.7		2560.2		2635.9	0.0	1304.1
Total Agri & Allied Imports			**164680.6**		**152061.2**		**137019.4**		**147445.8**		**97267.7**

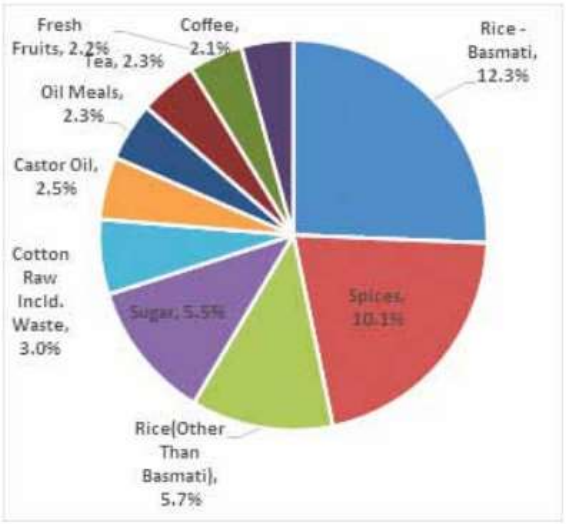
Source: Department of Commerce, Government of India

Share (in value terms)of top 10 exported and imported agricultural commodities during 2019-20 are as follows:

Import share in 2019-20 (Top-10 Items)



Export share in 2019-20 (Top-10 Items)



Source: Department of Commerce, Government of India

EXIM Agricultural Policy and the Role of Sustainable Agriculture

EXPORTS:

- Presently, almost all agricultural goods (not including allied activities) exports is free which means it is without any restrictions. The restrictions are only for seeds export. Mustard oil is allowed but only in branded packs (upto 5kg) and having Minimum Export Price (MEP) of US $ 900/MT.

IMPORTS

- Presently, the imports of agricultural goods under restrictions are potato, some vegetable seeds, cereals, oilseeds, refined palm oil, spices, urad, tur, moong, and peas. Besides these, all other commodities (allied commodities excluded) are free for import.

DETAILS OF RESTRICTIONS:

Government of India, together with Department of Agriculture, Cooperation & Farmers Welfare, Department of Consumer Affairs, Department of Commerce, Department of Food and Public Distribution, and finally, Department of Revenue, decided to save the domestic famers and producers from cheap imports and also safe guard the interest of the consumers, hence decided to restrict the imports of following commodities:

- Restriction on Import of palm oil since Jan 2020, to encourage the domestic producers to produce this vegetable oil.
- Decided to impose Minimum Import Price (MIP) of few commodities like Pepper (Rs. 500/kg) since 2017, Arecanut (Rs.251/kg) since 2017, Cashews (Rs. 720/kg) since 2019, Peas (Rs. 200/kg) since 2019, Desicated Coconut (Rs.150/kg) since 2020.
- Increased import tariff on wheat from 30% to 40% in 2019, as there was surplus production of wheat in the domestic market.
- Imposed Quotas on imports of peas and moong (i.e. 1.5 lakh MT/fiscal year) and for urad and tur (4 lakh MT/fiscal year) to fix the demand and supply gap.

- Imposed Tariff Quota at 10%, on the import upto 10 Lakh MT of potato from Bhutan (without license) to supplement its shortage in production from 2020 till Jan 2021.
- Ensuring the availability of Onion and onion seeds at affordable rates to consumers throughout the year, the exports were banned w.e.f September 2020 and only exports of two qualities of onion ie. Bangalore Rose Onion and Krishnapuram Onion were allowed upto 10,000 MT each till March 2021. Further, measures were taken to promote sowing and increasing production of onions and hence, the ban on exports was lifted on Jan 2021. This was done to get better prices for onions and hence help increase farmers income.

CONCLUSION

From time to time, Government has been taking appropriate steps to control inflation, making available all essential fruits, vegetables, pulses, oils at affordable rates to the citizens and have also been safeguarding the interest of farmers in terms of their income, building storage capacity, solving logistics and marketing issues. Government has taken various steps to ensure reduction in food wastage and accommodated the changing food habits of new India where proteins are preferred.

As discussed above that need for Sustainable Agriculture using conservation of water and natural farming to promote crop productivity and mechanization and encourage research is integral part of the agricultural sector development in future. Since, exporting rice which is being cultivated using huge amount of water is actually unsustainable for Indian Environment. Hence, the total earnings from rice exports cost India a lot of water consuming which is indeed the hidden cost. Therefore, sustainable agriculture is the focus of the government for future India.

However, there are other ways in which government can influence the farmers to promote crop diversification which is through the Minimum Support Prices (MSP). According to the latest Situation Assessment Survey (SAS), the net earnings from only crop production has risen by 23 percent as compared to the previous SAS report of 2014 and also there was significant diversification of income sources of farmers. As per the recommendations of Committee on doubling Farmer's Income to emphasis more on the allied sector to increase farmers income, the recent study confirmed that not only the allied sectors recorded a significant growth and contributed to growth of agricultural sector but also contributed to increase in the farmers income. This initiative showed how the potential of allied sector was harnessed and hence, it has increased economic wellbeing at micro and macro level. A similar focus is now on the food processing sector, which again has a full of potential to be achieved, as its one of the major sub-sectors and has significant share of total agricultural produce and a major chunk of workforce is employed in this sector. Government encouraged this sector using different measures like development of infrastructure, transportation subsidy, supporting the formalization of various micro enterprises. India manages one of the most far-reaching food management programmes of the world. With such a strong presence, India must have a strong global presence as well.

(Statistics, March 2022) (Department of Agricultural, 2020-21) (Niti Gupta, 2021) (Intensive Agriculture , April-June 2022) (H Pathak, 2022) (The future of food and agriculture: Trends and Challenges, 2017)

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