

Production and Export of Fresh and Dry Fruits in Jammu and Kashmir: An Analytical Study

Ishfaq Ahmad Shah*

ABSTRACT

Agriculture is the core sector of Indian economy and horticulture is a central component of it. In the horticulture sector of the Jammu and Kashmir (J&K) state, production of apple proved to be the most important fruit crop, as 8.00 crores boxes of apples are exported annually. Apple production is the main occupation in the Kashmir Valley (India) and constitutes 90% of total fruit crop in the valley. The horticulture crops also provide a better alternative for the diversification of Indian agriculture via higher returns. They play an important role in country's nutritional security as well, in addition to poverty alleviation and employment generation. From the last few years, production and productivity of horticulture fruits have increased manifolds and resulted in the huge amounts of dispatches from the state. The state is famous for its horticulture produce both in India as well as abroad. This paper emphasised the growth in area and production of fresh and dry fruits in J&K and the export of fresh and dry fruits. This study shows that there is positive growth in area and production of fresh and dry fruits and in export of fruits. In J&K though, there are some fluctuations in some years but these fluctuations are the results of flood in 2014 and turmoil in 2008, 2010, 2013, and 2016.

Keywords: Horticulture, Apple, Production, Area, Export

INTRODUCTION

Horticulture is part of agriculture, which is concern with the garden crops. Thus, the horticulture means cultivation of garden crops. Horticulture is known as the main component of agriculture, having a good share in the economy of the country. The distinct agro-climatic conditions and rich biodiversity enable India to produce a wide variety of horticultural crops. India is now the second largest producer of fruits and vegetables in the world and the leader in several horticultural crops, namely Mango, Banana, Papaya, Cashew nut, Areca nut, Potato, and Okra (Dar, 2017) (Murtaza, 2015). Jammu and Kashmir, with its wide variability of location, climate, soil and other agro-climate conditions, has good potential for growing a wide range of horticulture crops, such as fruits, vegetables, and plantation crops, which have high-value demand and attractive markets in India and abroad. With this backdrop, diversification towards horticultural crops has been suggested as a viable option to stabilize and raise farm income, enhance agricultural growth and increase employment opportunities (Rather, Lone, Reshi, & Mir, An Analytical Study on Production and Export of Fresh

and Dry Fruits in Jammu and Kashmir, 2013). Kashmiri horticulture has grown by leaps and bounds in the few years. Apple is a main crop of Kashmiri horticulture. Apple cultivation is considered a highly profitable and attractive economic activity in Kashmir (Rather A. M., 2017).

Jammu and Kashmir Scenario

Jammu and Kashmir is a Northern State in India, which consists of three divisions: Jammu, Kashmir valley and Ladakh, and is further divided into 22 districts (Dar, 2017). Nature has bestowed Jammu and Kashmir with such a geographical alignment, besides scenic splendour, that it enjoys year round cultivation of fruits. It is located at an altitude between 32.17 to 36.58 degrees above the mean sea level. The climate is transitional and distinctly classified as spring, summer, autumn, and winter. Accordingly, the state has been broadly classified into Temperate, Sub-tropical, Sub-temperate, and Cold arid zones. Jammu and Kashmir is well known for its horticultural produce both in India and abroad. The state offers good scope for the cultivation of horticultural crops, covering a variety

* Devi Ahilya University Indore, Madhya Pradesh, India. Email: shahishfaq45@gmail.com

of temperate fruits like apple, pear, peach, plum, apricot, almond, and cherry and subtropical fruits like mango, guava, citrus litchi, etc. As a result, there is a perceptible change in the concept of horticulture development in the state. The state is affected by continued violence and insurgency since the independence of India, and the economy is an underdeveloped one. Unaffected and unaltered by the modern-day industrial developments and changing regimes, the indigenous traditional occupations of farming, animal husbandry, and horticulture form the backbone of the economy (LONE & SEN, 2014). There are around 7 lakh families comprising of about 33 lakh people that are directly or indirectly associated with horticulture (Sangral, 2015). Horticulture development is one of the thrust area and a number of programmes have been implemented in the past, resulting in the generation of higher incomes in the rural areas, thereby improving the quality of life in villages. The growth of horticulture sector can be attributed to various initiatives taken by the government of India and the state government like Mission for Integrated Development of Horticulture, Prime Ministers Developmental Package, and High Density Plantation Programme. Under these schemes, due attention is being given towards establishment of high-density orchards, better post-harvest management by establishment of fruit mandies and creating controlled atmospheric storage facilities in addition to establishment of fruit/vegetables processing units, technological support, awareness/publicity initiatives, research and extension, etc.

Apple is considered the king of all fruits as it has been associated with the Biblical story of Adam & Eve between the Caspian and the Black sea, the Middle East just about 4000 years ago. It is one of the oldest varieties in existence; a research study states that humans have enjoyed apples ever since at least 6500 (BC) more than 7500 known cultivars of apples. China is the largest apple-producing country in the world and contributes over 50% of total production of the world; whereas, India is ranked as the 6th largest apple producing country in the world & second in Asia (Rather A. M., 2017). Kashmir, proudly known as the paradise on earth, is also home to temperate fruits like apple for which the state is very famous across the globe. Apple is the most important fruit crop of J&K State, as about 48% of the area is covered under apple as per the horticulture census 2016-17. It is also important in terms of production (17.26 lakh Mts.)

and provides the maximum marketable surplus of about 30% of A-grade, 40% of B-grade, and 30% of C-grade of pre-falls and culled apples, which accounts for substantial quantum of around 5.18 lakh Mts., which needs to be exploited as raw material for processing industry. The increased production, due to various developmental schemes, yielded some good results and our export worth approx. Rs. 6500 crores were reported during 2016-17 (J&K, 2017).

LITERATURE REVIEW

(Rather, Lone, Reshi, & Mir, 2013) in their study entitled *"An Analytical Study on Production and Export of Fresh and Dry Fruits in Jammu and Kashmir"* stated that due to the stagnant growth in agriculture sector and low commercial value of staple crops, farmers have made their intentions clear about the shifting of the agriculture sector to horticulture production. Diversification towards horticulture has become a viable option to stabilize growth and increase farm income and enhance agriculture growth. The diversification towards horticulture for improving sustainability, profitability, and productivity will help not only in improving farm income but will generate gainful employment. It is believed that horticulture sector can be promoted as a means of agro-diversification for the second green revolution in India.

(Manzoor & Ahmad, 2014) in their paper entitled *"Impact of armed conflict on the horticulture industry of Kashmir (a special reference of Sopore)"* try to explore the impact of armed violence on various aspects of life and on horticulture, in particular. The paper tries to understand the genesis of violence and impact on horticulture and the ramification thereof. There has been a drastic reduction of capital, income, and employment, which is associated with a wide range of factors including physical destruction of agricultural resources and industrial plants, reduced investment, and a mass displacement. Since horticulture industry in Kashmir is one of the pivotal pillars of its economy, there has been a huge impact on it in terms of its reduced production and in appropriate marketing due to conflict. More than half a million kannals of land are under the illegal occupation of security forces as has been justified by the fact that 5.86 lakh kannals of land is under the illegal occupation as per the Union Defence Ministry. Thus, it has been assumed that the horticulture industry in Kashmir has suffered a setback in terms of proportional decrease of cultivable horticultural land.

(Murtaza, 2015) in his research paper entitled “*Horticulture and its Role in the Economic development (An Empirical Study of Kashmir Valley)*” says that horticulture sector in the valley of Kashmir has lost its glory and pride. The factors like global warming, use of more fertilizers and less manure, supererogatory use of pesticides and inefficient supply chain have contributed to defile the horticulture sector. The results have been shown empirically using Chi-square analysis. The use of surplus pesticides has also resulted in deteriorating the quality of horticulture output. It was observed in the paper that there is a significant relationship between horticulture management and horticulture output. Development of horticultural sector should be accompanied by the growth of the agro-processing industry. The horticulture sector has also an immense potential of generating employment. The major employment can be generated by developing the horticulture-based agro-processing units. This sector needs to be developed as an organized industry and has to be run collectively by all the stakeholders.

(Kondal, 2014) in his research paper entitled “*Trends in Area and Production of Horticulture Sector in India*” analyzed the trends in the Indian horticultural sector, that is, to study the instability of all horticulture crops in India and examine the relationship between horticulture sector’s area, production, and horticulture sector exports from, and import to, India. There is a high-and-strong relationship between horticulture production and horticulture exports from India. In order to reduce the imports from abroad, to increase the area under the cultivation of horticulture crops and productivity through adopting modern technology is a pre-condition in Indian horticulture sector.

OBJECTIVES OF THE STUDY

- To study and evaluate the production, area and productivity of apple fruit in Jammu and Kashmir.

- To study and evaluate the area and production of fresh and dry fruits in Jammu and Kashmir.
- To evaluate the export of fresh and dry fruits from the state to outside markets.

RESEARCH METHODOLOGY

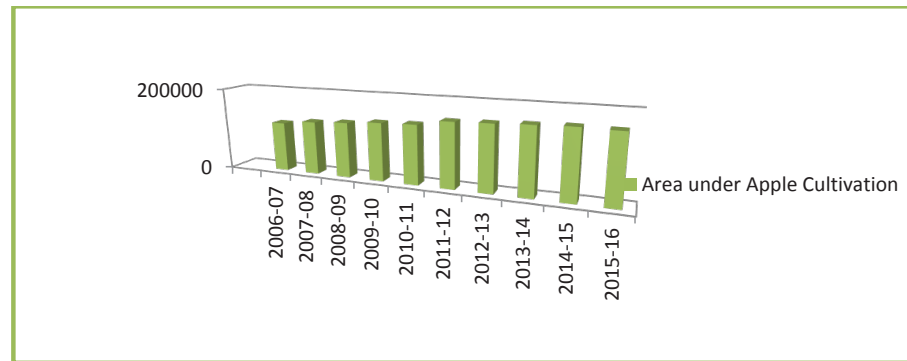
The present study is analytical and empirical in nature, based on secondary data source. The data is collected and analysed for the time period of past one decade. Data is collected from the Directorate of Horticulture Planning and Marketing Jammu and Kashmir, the National Horticulture Database, and the Directorate of Economics and Statistics J&K sources. Further, various published research papers and reports of state and central governments have been used to arrive at the aforesaid objectives of the study. Mostly tabular and graphical presentation in the form of percentage, charts, etc., has been used to highlight data pertaining to the said objectives.

DISCUSSION AND FINDINGS OF THE STUDY

The apple (*Pyrus domestica*) is one of the principle fruits grown in the temperate region of the world. It has beautiful and colourful appearance, crispy flesh, pleasant flavour, and sweet taste that attract the consumers and fetch good price. Jammu and Kashmir is home to some world famous varieties of fruits and apple is one among these fruits (Singh, Mishra, & Shiekh, 2017). Apple production is a major cultivation in the state. From past one-and-half decade, production and area under apple cultivation have substantially increased due to high value of apple production.

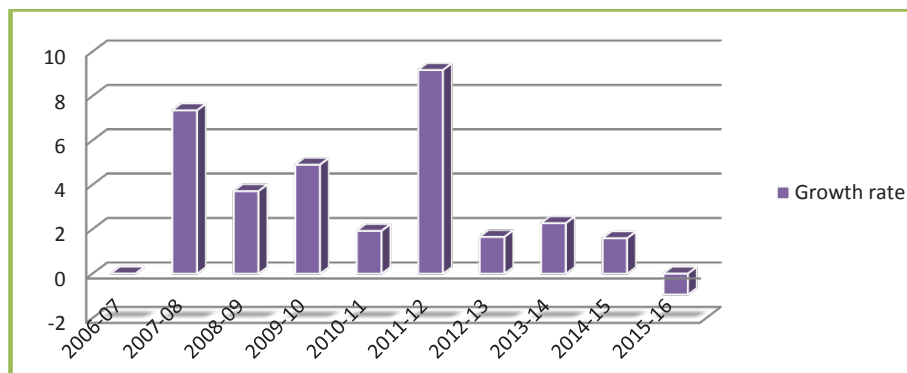
Table 1: Area Under Apple Cultivation in Jammu and Kashmir from 2006-07 to 2016-17

S. No.	Years	Area (Hectares)	Growth rate	Production (Metric tonnes)	Growth rate	Productivity (M/H)
1.	2006-07	119041	0	1222176	--	10.26
2.	2007-08	127795	7.35	1311845	7.33	10.26
3.	2008-09	132538	3.71	1332811	1.59	10.05
4.	2009-10	139041	4.90	1367805	2.62	9.83
5.	2010-11	141717	1.92	1852413	35.42	13.07
6.	2011-12	154721	9.17	1749227	-0.567	11.30
7.	2012-13	157280	1.65	1348155	-22.92	8.57
8.	2013-14	160865	2.27	1647687	22.21	10.24
9.	2014-15	163432	1.59	1170306	-28.97	7.16
10.	2015-16	161880	-0.94	1964982	67.90	12.13



Source:-Various Economic Surveys of Directorate of Economics & Statistics J&K.

Fig. 1.1: Area under Apple Cultivation

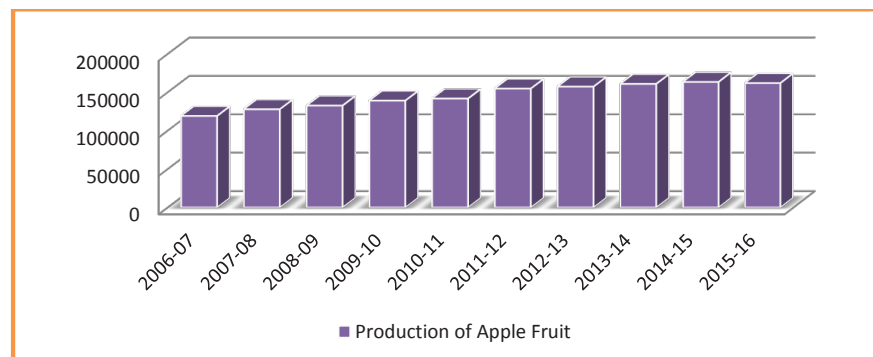


Source:-Various Economic Surveys of Directorate of Economics & Statistics J&K

Fig. 1.2: Growth Rate

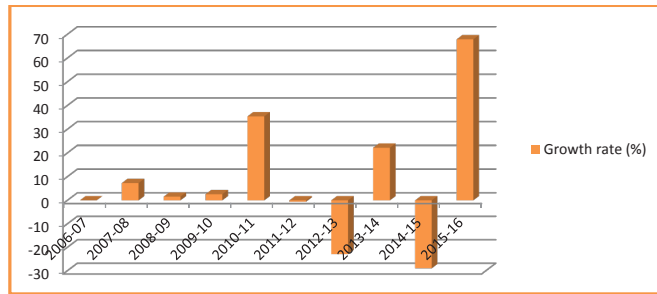
Table 1 and Figs 1.1 and 1.2 depict that there is continuous progress of apple cultivation in Jammu and Kashmir state from 119,041 hectares to 161,880 hectares from the last decade from 2006-07 to 2015-16. It is clearly seen that there is continuous growth and the highest growth

rate is recorded in 2011-12 by 9.17%. The main reason for the increasing trend was mainly the comparative improvement of this crop over other commercial crops grown in the high-altitude region in the state.



Source:-Various Economic Surveys of Directorate of Economics & Statistics J&K

Fig. 1.3: Production of Apple Fruit

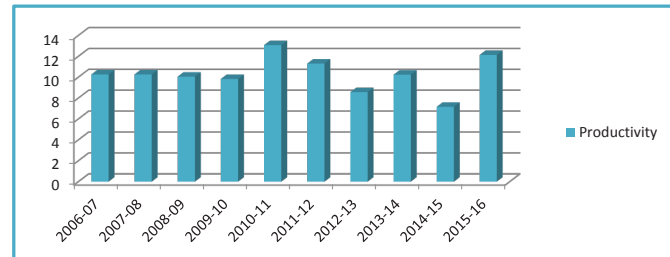


Source:-Various Economic Surveys of Directorate of Economics & Statistics J&K

Fig. 1.4: Growth Rate (%)

The table depicts that there is a continuous increase in apple production in Jammu and Kashmir from 2006-07 to 2015-16 from 1222176 metric tonnes to 1964982 metric tonnes, respectively. The highest growth rate is recorded in 2015-16, which is 67.90%. There are some fluctuations in some years like in 2012-13 and 2013-14 by 22.92% and 28.97%, respectively. The low growth rate of apple fruit

in these years might be because of continuous rainfall, rise in temperature, heavy snowfall, etc.



Source:-Authors own calculations from above table

Fig. 1.5: Productivity

Fig. 1.3 clearly shows that the productivity of apple fruit has been continuously increasing. Productivity is calculated by production divide by area. When the production and area are continuously increasing, the productivity is also increasing because it is the result of area and production.

Area under Major Horticulture Crops in J&K from 2006-07 to 2016-17

Table 2

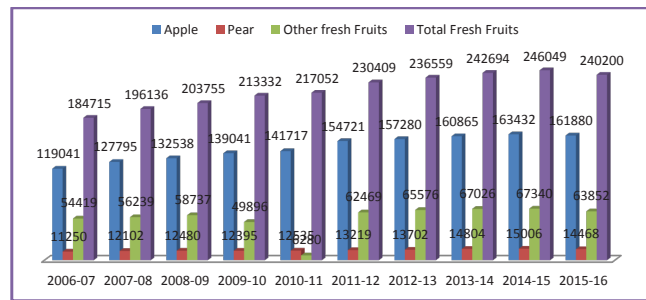
(Area in Hectares)

Years	Fresh Fruits				Dry Fruits				All Fruits
	Apple	Pear	Other fresh Fruits	Total Fresh Fruits	Walnuts	Almond	Other Dry fruit	Total Dry Fruit	Total
2006-07	119041	11250	54419	184715	81393	16374	602	98369	283084
2007-08	127795	12102	56239	196136	82045	16405	554	99005	295141
2008-09	132538	12480	58737	203755	85148	17161	629	102938	306693
2009-10	139041	12395	49896	213332	88593	17581	621	106795	320127
2010-11	141717	12535	62800	217052	89789	17587	643	108019	325071
2011-12	154721	13219	62469	230409	91992	18404	567	110963	341372
2012-13	157280	13702	65576	236559	93641	15931	850	110422	346981
2013-14	160865	14804	67026	242694	95601	15982	815	112399	355092
2014-15	163432	15006	67340	246049	57048	15350	180	72578	359066
2015-16	161880	14468	63852	240200	88960	7132	492	96584	336784

Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir

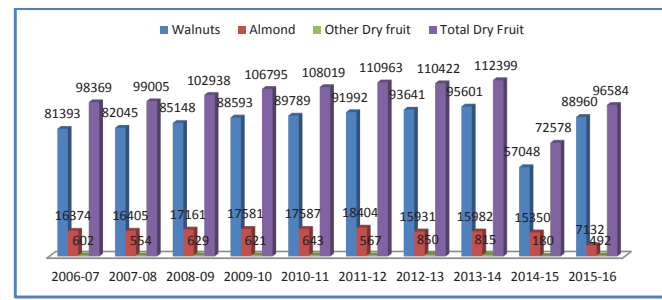
Table 2 and Figs. 2.1 and 2.2 show that Area under Fresh and Dry fruits both are increasing. Fresh fruits include apple, pears, cherry, apricot and other fresh fruit, and Dry Fruits include walnuts, almonds, and other dry fruits. The Area under Apple Fruits has increased from 119041 hectares to 161880 hectares. This means that the Area under apple Fruit from 2006-07 to 2015-16 has increased by 36% and under Pear fruit it has increased from 11250 hectares to 14468 hectares that is 28.60%. The total area

under Total Fresh Fruits has increased from 184715 hectares to 240200 hectares, which is 30.03%. Under Dry Fruits, the major contribution is from walnuts. The total area for walnut has increased from 81393 hectares to 88960 hectares, which is 9.29% but in almonds the total area has decreased from 16374 hectares to 7132 hectares that is 56.44%. In Total Dry fruits, the total Area has decreased from 98369 hectares to 96584 hectares that is -1.81%.



Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir

Fig. 2.1: Area under Fresh Fruits



Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir

Fig. 2.2: Area under Dry Fruits

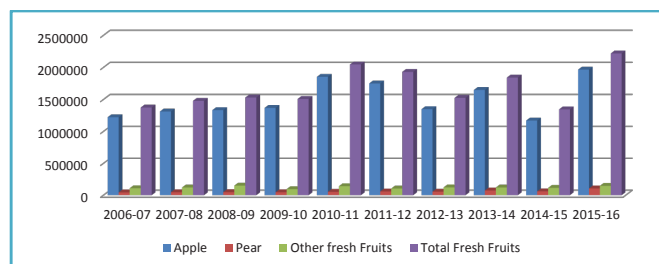
Production Under Major Horticulture Crops in J&K from 2006-07 to 2016-17

Table 3

(Qty in Metric Tonnes)

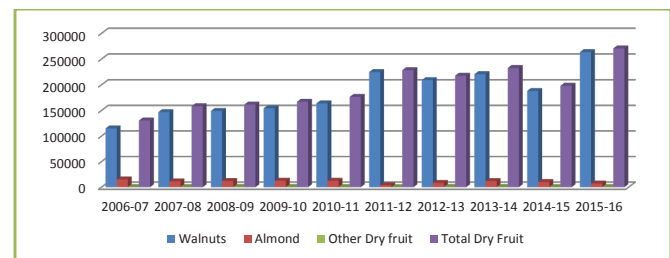
Years	Fresh Fruits				Dry Fruits				All Fruits
	Apple	Pear	Other fresh Fruits	Total Fresh Fruits	Walnuts	Almond	Other Dry fruit	Total Dry Fruit	Total
2006-07	1222176	43089	108413	1373678	114926	15183	224	130333	1504011
2007-08	1311845	45860	120215	1477920	146781	11261	241	158283	1636203
2008-09	1332811	47392	149687	1529839	149135	12043	251	161429	1691322
2009-10	1367805	45817	94293	1507915	154276	12515	181	166972	1674887
2010-11	1852413	52501	140633	2045547	163744	12511	180	176435	2221982
2011-12	1749227	58121	104401	1929349	224596	3741	66	228403	2157752
2012-13	1348155	54847	121575	1524577	209051	8206	290	217547	1742124
2013-14	1647687	73515	119998	1841200	220589	11815	344	232748	2073948
2014-15	1170306	59721	114525	1344553	187934	10052	137	198123	1542676
2015-16	1964982	105699	146098	2216779	263466	7060	124	270650	2487429

Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir



Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir

Fig. 3.1: Production of Fresh Fruits



Source:-DIGEST OF STATISTICS 2015-16 Directorate of Economics & Statistics Government of Jammu and Kashmir

Fig. 3.2: Production of Dry Fruits

Table 5.4 depicts the production of fresh fruits, which include apple, pears, cherry, apricot, etc. In Apple fruit, the production has increased from 1222176 mt in 2006-07 to 1964982 mt in 2015-16, which is 60.77%. In Pear fruit, the production has increased from 43089 mt in 2006-07 to 105699 mt in 2015-16, which is 145.31%. The contribution of other fresh fruits has also increased from 108413 mt in 2006-07 to 146098 mt in 2015-16. The total fresh fruits production has increased from 1373678 mt in 2006-07 to 2216779 mt in 2015-06, which is 61.37%.

Dry fruits include Walnuts, Almonds and Other Dry Fruits. In Walnut fruits, the production has increased from 114926 mt in 2006-07 to 263466 mt in 2015-16, which is 129.24%. In Almonds, the production has decreased from 15183 mt in 2006-07 to 7060 mt in 2015-16, which is -53.50%. The contribution of other dry fruits has also decreased from 224 mt to 124 mt in 2015-16, which is -44.64%. The contribution of total Dry fruits has increased from 130333 mt in 2006-07 to 270650 mt in 2015-16.

In a nut shell, it can be concluded from the above tables and graphs that the production of fresh fruits and dry fruits has continuously increased. Though there are some fluctuations in many years and in many fruits like

in Almonds and Other Dry fruits, these fluctuations may be because of seasonal variations coupled with floods of September 2014 that resulted in loss to the horticulture industry.

Export of Fruits from Jammu and Kashmir to Other States and Countries

In the state of Jammu and Kashmir, the export of fruits, both fresh as well as dry fruits, has occupied an important position in terms of trade matters. Exports of fruits have shown considerable progress. Export of fruit outside State for the year 2015-16 as per the Directorate of Horticulture (P&M) was 14.58 lakh mt. The total quantity exported during 2006-07 was 692895.1 in which 678440.58 mt (97.91%) was fresh fruits and 14454.51 mt (2.09%) was dry fruits and in 2015-2016 the total fruits exported is 1479742 mt in which 1458220.36 mt (98.54%) was fresh fruits and 21521.62 mt (1.46%) was in Dry fruits. These results clearly show that the contribution of both fresh as well as in Dry fruits has increased and the major contribution of export of fruits is in fresh fruits; in fresh fruits, the major share is in apples.

Year wise Export of Fresh and Dry Fruits from J&K state

Table 4

(Metric tonnes)

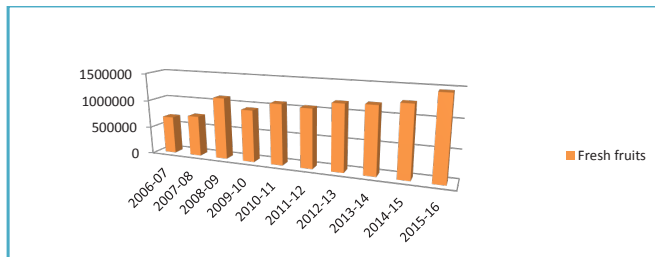
S.No	Years	Fresh fruits	Growth rate	Dry Fruits	Growth rate	Total
1.	2006-07	678440.58	---	14454.51	--	692895.1
2.	2007-08	733710.35	8.14	16077.78	11.23	749788.1
3.	2008-09	1101592.75	50.18	15479.13	-3.72	117071.88
4.	2009-10	934910.18	-15.31	23171.18	49.69	957962.4
5.	2010-11	1087638.05	16.33	25124.16	8.42	1112762
6.	2011-12	1053832.95	-3.10	27868.36	10.92	1081701
7.	2012-13	1176228.50	11.61	25613.98	-8.08	1201842
8.	2013-14	1192001.65	1.34	11106.49	-56.63	1203108
9.	2014-15	1254944.90	5.28	16940.80	52.53	1271886
10.	2015-16	1458220.36	16.19	21521.62	27.04	1479742

Source: Directorate of Horticulture, Srinagar Govt. of Jammu & Kashmir

Table 4 and Figs 4.1 and 4.2 depict that the export of fresh and Dry fruits has increased from previous years. In 2006-07, the export of Fresh fruits was 678440.58 mt, which is 97.91 of the total Fruits exported in 2006-07, and in 2016-17, the export of fresh fruits has increased up to 1458220

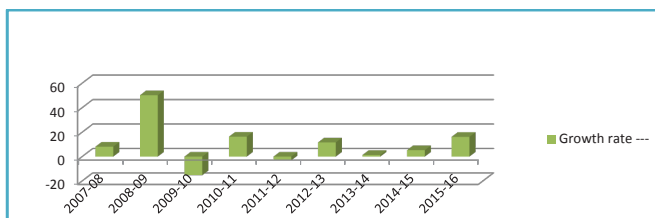
mt. The export of fresh fruits in 2015-16 increased by 46% from 2006-07 and is clearly shown in the above table and graph that there is an increasing trend of export of fresh fruits in these years and the highest growth rate is recorded in 2008-09, which is 50% from previous year 2007-08.

Though there are some fluctuations in some years, these fluctuations are the results of turmoil and flood in the state of Jammu and Kashmir. There are many suggestion which should be implemented by the government so that the export of fresh fruits will increase. These suggestion are: the Grading and Quality Control Act should be executed, which includes the establishment of grade specification and enforcement of grading programmes; operation of inspection systems and control laboratories. At the same time, grading should be carried out in accordance with the best mechanical device. Other important suggestion is that cold storage facilities should be constructed at export marketing centres so as to ensure the grower of the state the facility of cold storage at terminal markets, when they feel low returns of their produce as a result of glut at export marketing centres.



Source: Directorate of Horticulture, Srinagar Govt. of Jammu & Kashmir

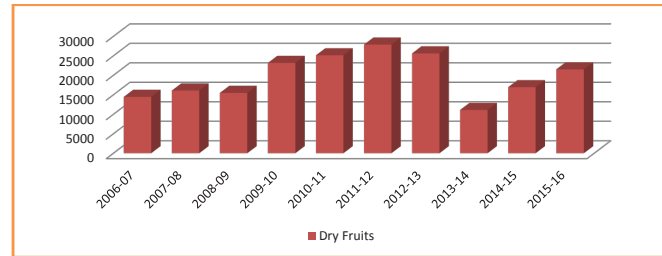
Fig. 4.1: Export of Fresh Fruits



Source: Authors own calculation from above table

Fig. 4.2: Growth Rate

Another most important suggestion is that the market information centres should be established, which will provide the apple growers and traders day-to-day knowledge and information about the happenings and trends prevailing in the various marketing centres in and outside the state. Such a facility will help the growers and traders to decide about future market strategy.



Source: Directorate of Horticulture, Srinagar Govt. of Jammu & Kashmir

Fig. 4.3: Export of Dry Fruits



Source: Directorate of Horticulture, Srinagar Govt. of Jammu & Kashmir

Fig. 4.4: Growth Rate

Jammu and Kashmir is promoting exports from other states to the rest of the state and to the other countries as well. State Dry Fruit (which include almonds, Walnuts and other Dry fruits) goes to other countries and, in turn, earns a significant foreign exchange. From the above graph, it is clearly seen that the share of export of Dry Fruits has increased continuously mainly in Walnuts and almonds. In 2015-16, the share of export of dry fruit has increased to 21521.62 mt from 14454.51 mt. This means that there is the growth rate of 48% in 2015-16 over 2006-07 and the highest growth rate is measured in 2014-15, which is 52.53%. This is a good sign for the growth of horticulture sector and for the overall economy of the state. Growers producing such products are also in a position to enhance their standard of living. The government should also take necessary steps like loan facilities and other promoting techniques in order to increase the area and productivity under Dry fruits so that many young people are able to earn their livelihood and they can export more and more dry fruits and earn good returns from foreign countries.

CONCLUSIONS

The horticulture of the state has grown significantly during the post-independence period. There is an increase in production land under crop and in income. Out of the total area of horticulture in the state, 90% is concentrated in the valley due to its suitable climate. With an annual turnover of 75 million US\$, this sector is the biggest source of income in the state's economy next to agriculture. Due to continuous increasing trend in the area and production of fresh and dry fruits and in the export of both fresh and dry fruits, the agriculture land gets diversified into horticulture land and increasing production of horticulture produces directly influence the income, employment and living standard in the rural areas of the Jammu and Kashmir state.

The total Area under Total Fresh Fruits has increased from 184715 hectares in 2006-07 to 240200 hectares in 2015-16 which is 30.03%. In Total Dry fruits the total Area has decreased from 98369 hectares in 2006-07 to 96584 hectares in 2015-16 that is -1.81. The total fresh fruits has increased from 1373678 MT in 2006-07 to 2216779 mt in 2015-06 which is 61.37%. The contribution of total Dry fruits has increased from 130333 mt in 2006-07 to 270650 mt in 2015-16. The total fruits exported are 1479742 mt in which 1458220.36 mt (98.54%) was fresh fruits and 21521.62 mt (1.46%) was in Dry fruits. These results clearly shows that the contribution of both fresh as well as in Dry fruits have increased and the major contribution of export of fruits is in fresh fruits. In fresh fruits, the major share is in apples. The contribution of dry fruits has not increased only the share of walnuts has increased but in other dry fruits the contribution has not increased. The Government should take necessary steps and give many schemes and policies through which the production, area and export of fresh fruits as well as dry fruits increases continuously like educate and enable the farmers to change their techniques of production and give the farmers quality fertilizer and fungicide and better storage facilities. There is also a need to properly implement the market intervention scheme to help facilitate growers to sell their produce with improved returns.

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