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## Social and economic empowerment of farm men and women in strawberry based entrepreneurship for sustainable income

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### Abstract

Horticulture has emerged as an indispensable part of agriculture, offering a wide range of choices to the farmer for crop diversification. It also provides ample opportunities for sustaining large number of agro-industries which generate substantial employment opportunities; India is the second largest fruit producer of fruits in the world after China crop diversification towards high value crops with efficient recourses use practices offers a great scope for improvement in income of the farmers. Strawberries are good source of natural antioxidant and medicinal properties. Awareness about the production of the crop during Rabi season in subtropical conditions with planting material and production technology can make strawberry a successful crop in subtropical conditions. Strawberry varieties like Camarosa, Festival, Winter dawn, Sweet Charlie, Florina and Navila are performing well in Aurangabad district when planted in mid of September. On an average Sri Brij Kishor Mehta farmer of Aurangabad district earn net profit Rs 10,82,960 per annum during the year 2017-18 from 6 acre of cultivable land. He has expand his area up to 11 ha and also motivated other farmers and generated income for other farm men and women.

**Keywords:** Economic empowerment, strawberry entrepreneurship

### Introduction

Diversification towards high value crops offers great scope to improve farmer income. The aim of the present research was to change the economic condition of the farmer by changing of crop. The cropping system has been changed in Rabi season by cultivation of strawberry. Strawberry (*Fragaria X ananassa*) a small fruit crop and a hybrid of two highly variable octoploid different environmental conditions (Rieger, 2005) [7] The strawberry is grown throughout the world and cultivation and production increase each year. The strawberry is an important crop worldwide in terms of both its commercial value and the role it plays in rural economics. The strawberry is a microclimatic crop cultivated almost worldwide and the world's first largest strawberry producer is USA and followed by Spain. It is cherished in gardens and commercial fields with glamorous red, delicious with a unique shape, highly perishable fruit with a pleasant flavor. It is refreshing, nutritious soft fruit having a distinct tantalizing aroma (Sharma and Yamdagni, 2000) [9]. It is highly nutritious having a rich source of vitamins A, B, C and niacin, minerals like phosphorus, potassium, calcium and iron (Karkara and Dwivedi, 2002) [3]. It is utilized for the production of purees, juice concentrate, jams, preserves and rose red wine. Medicinally, strawberries have been known to kill certain viruses like polio, herpes and these may block the formation of nitrosamines, which can cause cancer, furthermore these contain relatively high quantities of ellagic acid, which has a wide range of biological activity only recently discovered (Rieger, 2006) [8]. The wide diversity of strawberry plant gives an idea of its potential for selection work. Choice of cultivars is of paramount importance for successful strawberry cultivation (Asrey and Singh, 2004; Ahsan *et al.* 2014) [2, 1].

Strawberry consumption improves blood circulation, open heart blockage, controls blood sugar, controls blood pressure and improves the function of blood platelets. It also lower cholesterol and reduce inflammation, decreased oxidative stress and cancer prevention.

Strawberry being a high value crop offers a good scope for its cultivation in North Indian conditions because of its climatic suitability during fruit production. As strawberry fruit bearing and maturity occur in a short time (20-40 days after pollination) and also strawberries have shallow root system light and water management are critical for achieving high yield and fruit quality of strawberry (Li *et al.* 2010) [6] High temperatures (24-32°C) reduces strawberry flower formation and fruit quality (Klamkowski & Treder 2008) [5].

High temperature on the fruit surface caused by prolonged exposure to sunlight hasten ripening and other associate events. Strawberry fruit exposed to greater sunlight ripened faster. The relationship between high temperature and the rate of ripening could be argued as a factor in reduced crop cycle duration of (Woolf *et al.* 1999) [11].

The requirements of future cultivation system for the strawberry need to be discussed further to help deliver increased availability of high quality fruits to consumers, as well as to minimize the negative impact on the environment the rise of damage related to climate change. Mulching is a practice which helps in proper growth and development of the plants by modifying soil temperature by providing better nutrient availability and by better moisture conservation (kher *et al.* 2018) [4]. Mulching has strong influence an yield quality and duration of harvesting, which is primarily due to better soil and moisture conservation changes in soil temperature, improved nutrient availability and suppression in number and growth of meedo, protection from frost injury and reduction in number of dirty and disease berries. (Sharma 2002) [10].

Success story of Strawberry cultivation farmer (Sri Brij Kishor Mehta)

The strawberry fruit is temperate crop. It is well established in Northern Indian condition, under annual production system during Rabi season. Awareness of strawberry cultivation was been brought within the farmer of Aurangabad district. As Sri Brij Kishor Mehta was the first farmer who started cultivating in Bihar. Sri Brij Kishor Mehta belongs to village Chilkhi bigha, block Kutumba district Aurangabad. He was born in poor family, he could not continue his studies after I. Sc. So he started helping his father in agriculture. His father use to cultivate cereals and pulses crop like paddy, wheat, lentil and gram in 3 acre of land. But slowly he started cultivating vegetable crop in 0.5 acre of land then he found cultivation of vegetable is also giving good income then he was encourages and started cultivating vegetable in 1 acre of land he constructed 1 net house. He started growing of season vegetables and early vegetable which fetched him good income as family was big so he has to send his elder son to Haryana in search of job. His son started working in farm house at Hissar there he found that strawberry is cultivated in large scale and is exported different parts of country and abroad.

He found that climatic condition and soil is similar to district Aurangabad. If strawberry can be cultivate in Hissar than why not at Aurangabad. He brought 40 plant of strawberry out of which only 7 plants survived then he visited KVK Aurangabad. Learning by doing and consultation with expert for different problems faced in strawberry had made him successful. Gradually he became the expert of this crop and are able to guide other for this cultivation from 7 plants he got 8 kg of fruit which was very tasty, nutritious and very expensive. Then in 2014-15 he cultivated strawberry in 14 kattha (0.4 acre) he earned Rs 4,83,000 as net profit.

**Table 1:** During 2013-14

Crop	Area (in acre)	Cost of cultivation (Rs)	Gross Return (Rs)	Net Profit (Rs)
Paddy	3	45000	80000	35000
Lentil	1	8000	15000	7000
Gram	1	9000	18000	9000
Vegetable	1	20000	80000	60000
Total		82000	193000	111000

**Table 2:** During 2014-15

Crop	Area (in acre)	Cost of cultivation (Rs)	Gross Return (Rs)	Net Profit (Rs)
Paddy	3	40000	85000	45000
Vegetable	2.5	50000	110000	105000
Strawberry	14 Kattha	61150	544150	483000
Total		151150	739150	633000

**Table 3:** During 2015-16

Crop	Area (in acre)	Cost of cultivation (Rs)	Gross Return (Rs)	Net Profit (Rs)
Paddy	3	40000	85000	45000
Vegetable	1	22000	90000	68000
Strawberry	2	985000	1869800	884800
Total		1047000	2044800	997800

**Table 4:** 2016-17

Crop	Area (in acre)	Cost of cultivation (Rs)	Gross Return (Rs)	Net Profit (Rs)
Paddy	3	45000	95000	55000
Strawberry	3	1669000	2731000	1062000
Total		1714000	2826000	1117000

**Table 5:** 2017-18

Crop	Area (in acre)	Cost of cultivation (Rs)	Gross Return (Rs)	Net Profit (Rs)
Paddy	3	46080	97800	51720
Strawberry	6	3689400	5309700	1620300
Total		3735480	5407500	1672020

From table 1 to table 5 (2014-18) it has been noticed that the graph has drastically changed only by cultivation of strawberry. This has empowered them for the cultivation as well as innovations in the cultivation of this exotic fruit crop in subtropics. The farmers Sri Brij Kishor Mehta says that cultivation of strawberry can double the income of farmers. Strawberry is exported to different place like Calcutta, Dhanbad, Raipur, Ranchi, Patna etc and local market. Strawberry is a delicate fruit and requires lots of care while harvesting handling and transporting to the market demands properly packaged strawberry fruits so that while handling fruits are bruised or damaged wide range of packaging trays for strawberry fruits are used. These trays are designed to keep the fruits safe and in good condition during transit plastic boxes with the holes are used for packing strawberries. Again plastic boxes with strawberries are packed in trays so that it can be easily be transported to different places in better conditions of fruits.

Sri Brij Kishor Mehta is the "Founder of strawberry" in Bihar, he has developed entrepreneurship for rural youth and village farm man and women. These men go different places in search of job. But after strawberry cultivation has started in Aurangabad district these people are working in his field and gets good earning to live happily with their family.

Sri Brij Kishor Mehta has planned to cultivate strawberry in 11 ha of land and even he motivated other 55 small farmer to cultivate strawberry to double their income. As strawberry cultivation has been very much popularized among the farmer of district Aurangabad. In 2018-19 the Bihar government has planned to give Rs 1.12 lakh/ha as subsidiary to the strawberry growers.

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