Journal of Agricultural Development and Policy, 2022
Volume 32, No. 1, 36-41

Study of Socio-Economic Status of Vegetable Growing Community and Adoption of Improved Techniques and Varieties in Vegetable Hub of Malerkotla (Punjab): A Survey Investigation

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Abstract

A survey study was conducted to investigate the experience, socio-economic status of the vegetable growing community and their adoption of improved techniques and varieties in the vegetable hub of Malerkotla during 2018-19 and 2019-20. The major cropping pattern followed by vegetable growers of Malerkotla is multiple cropping and inter-cropping i.e. Paddy- cucumber+ bitter gourd + capsicum+ onion and Paddy-cucumber + bitter gourd+ chilli + onion occupies more than 56 % of the total vegetable area during winter under low-tunnels and summer and earning a net-income of Rs. 1.8 - 2.2 lakhs per acre. Nearly 82% of the growers have not to pay any loan and only 18 % have availed the loan facility. Although they have high confidence in private sector varieties but now they have diverted their interest to public sector varieties and have 16- 59 % adoption level in different vegetable crops. The government subsidies are not in the reach of these small and marginal farmers as they have mostly leased-in-land and face to difficulty to avail this facility.

Keywords: Agriculture, Marketing, Socio-economic status

JEL Classification: Q1, Q13, Q19

Introduction

Malerkotla, a newly constituted 23rd district of Punjab is a Muslim (Kamboj Community) dominated city which has a majority population of 68.5 % Muslims, 20.71% Hindus, 9.5% Sikhs and 1.11% of Jains (Anonymous, 2012). Malerkotla is a vegetable hub of Punjab where the vegetable growers varying from big farmers to small peasants to even landless people, have been engaged in vegetable production for generations. Vegetable growers of around 35 villages in and around the Malerkotla have been growing *kheera* (cucumber), *karela* (bitter gourd), chapankadu, *zuchhni* (marhupetha), *bhindi* (okra), brinjal, cauliflower, onion, peas, leafy vegetables and garlic in multiple, mix and inter-cropping systems as intensification of cropping both in time and space dimensions to increase per unit production (Singh *et al*, 2013). In fact, there is a Kamboj community of Muslims in and around Malerkotla which is considered unrivalled in the farming of vegetable and there is also a notion that no one can match the skills of this community in the art of growing vegetables. Malerkotla has improvised well-known vegetable market at the national level and the farmers prefer to sell their vegetables in this market because of the vegetable market stays active till afternoon while the other markets wind up the auction process by 9.00 a.m. in the morning. During the peak harvesting of cauliflower, bitter gourd, cucumber etc. the market remains functional even in the evening from 4.0 PM to 7.30 PM particularly for large growers and traders. The Cauliflower, okra, brinjal and cucurbits are the prominent vegetables to be grown by the farmers that are transported throughout the state and cities like Chandigarh and Dehli from Malerkotla every afternoon with additional supply to the neighbouring states like J & K, Haryana, Rajasthan and Himachal Pradesh. Total acreage under vegetable crops in Malerkotla was 3158 and 3627 hectares during 2018-19 and 2019-20 cropping year, respectively. They are adopting paddy as major kharif crop which is grown more than 80 % area may be due to cover the risk of land lease and also to decrease the incidence of insect-pests and weeds and grow early vegetables under low-tunnels during winter which may be prolonged to July next year.

Data Sources and Methodology

Study was conducted in Punjab state. District Malerkotla was selected purposively as the area under vegetable

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cultivation is high and the investigator works there. Keeping this in mind a survey study was conducted during the year 2018-19 and 2019-20 to investigate the experience, socio-economic status of the vegetable growing community and their adoption of improved techniques and varieties in the vegetable hub of Malerkotla. In one cluster of Malerkotla around 35 villages growing vegetables and out of these 15 villages selected randomly for data collection. An interview schedule with items was designed to collect information related to all the aspect and their socio-economic status along with subsidiary occupations. The data on socio-economic aspects, farm management and production system has been collected from the 90 vegetable growing families randomly in 15 villages in Malerkotla vegetable growing hub i.e. 6 families for village. The analysis of the data has been done on mean average percentage basis.

Results and Discussion

The data collected and analysed on different aspects has been discussed given below:

Socio-economic conditions of the community and farm management system: There are more than 35 villages surrounding Malerkotla where the farmers are embedded in growing vegetable for their livelihood.

It is revealed from the table-1 that about 55.9 % of the farmers are having land holding between 1-3 acres where as 20.6 % of them have less than one acre of land. Only 17.6% farmers have more than 3 acres of land. Similarly, around 5.9% of the cultivators have no land holding. Land lease system is an important factor to generate the employment in this hub. Although 32.1% farmers have taken no leased-in-land but majority of the farmers i.e. 67.9% have found to take leased-in-land in the vicinity of 10-12 km area of Malerkotla city. There are 42.3% farmers who have taken up to 3 acres of land on lease whereas 57.7% farmers have taken more than 3 acres of land on lease. The rent for leased-in-land varies from Rs. 65000/- to 70000/- per acre depending upon the locality and vicinity of the vegetable growing area. The farm machinery including tractor and other implements

Table 1. Socio-economic status of the farming families engaged in this occupation

Particulars	Category/ Subsidiary	% age
Qualification	Graduate	5.9
	Primary to 10+2	55.9
	Illiterate	38.2
Family members	Up to 6	36.8
	6-10	52.9
	>10	10.3
Land holding (acres)	Landless	5.9
	< 1.0	20.6
	1-3	55.9
	>3.0	17.6
Leased-in-Land system	No land lease	32.1
	Land lease	67.9
	Land lease up to 3 acres	42.3
	Land lease more than 3 acre	57.7
Farm machinery	Tractor and ancillary implements	67.3
	No machinery	32.7
Subsidiary occupation	Nil	80.9
	Dairy	11.8
	Others livelihoods	7.3
Animal husbandry	Goat farming	27.9
	Buffaloes and cows (2-3) for domestic and some may be for local sale	75
Loan facility availed	No loan	82.3
	1-6 lakhs	17.7
Nursery raising business	0.25-1.0 acre	13

has been owned by 67.3% farmers which are also used for transportation of vegetables. Although, majority (80.9%) of the farmers are dependent on vegetable production still 12% farmers are found to be engaged in dairy farming as additional subsidiary and 7% in other occupations for their livelihood. Goat farming is being practiced by 28% farmers and nearly 75% farmers have 2-3 buffaloes and milking cows for domestic needs with partial sale to local people. An important phenomenon in farming is agriculture loan that has many pros and cons for the farmers. The data presented in Table 1 revealed that 82.3% of the farmers have taken no loan for farming operations and only 17.7% farmers have availed the loan facility ranging from 1.0 lakh to 6 lakh from commercialized banks and co-operative societies. The other most important aspect in their farming is that all the family members including women and children work in their fields and outside labour is employed during crisis and peak load of the work. Nursery production has recognised as a well-established business for 13% farmers and supplied throughout Punjab and nearby states.There are some of the villages like Dalelgarh, TakharKhurd, BinjokiKalan etc. where the farmers not only grow vegetables in their own village but also take land on lease in the nearby villages in the vicinity of 10-12 kms from their native village.

Cropping –pattern and management practices: The major cropping sequence in this area is multiple cropping and inter-cropping system in which more than 2-3 crops are grown in the same field at the same time or simultaneously in the same season to increase per unit area production (Hazra and Som, 2006) and earning remunerations of Rs. 1.8-2.2 lakhs per acre net income annually from that particular crop rotations as revealed in table-2.

The area during winter is mostly under cucurbits like cucumber, bitter gourd, bottle gourd, chappankadu, sponge gourd, zuchhini, muskmelon, pumpkin and water melon crops along with capsicum and chilli under low-tunnels. Inter-cropping, relay-cropping and mix-cropping are progressively followed by the growers and observed to be more economical and aggregate income is more than sole crops. Erstwhile, these vegetables were grown using sarkanda during winter which was not competent as effective as low tunnels. The introduction of low tunnel technology and planting techniques by Punjab Agricultural University have not only promulgated the early vegetable revolution but also increased the area under winter vegetables and robust net returns. Mainly two sowings of autumn-winter (June-July) and spring (October-November) crop are done (Sidhu and Dhatt, 2007).In case of brinjal, the farmers cultivate only those varieties which have good market demand and also preferred by consumers. The winter crop of brinjal is grown under low tunnels and may be prolonged as annual crop in this area. The climatic hindrances may propagate insect-pests and production problems which

Table 2. Cropping systems and Economics of different vegetable based crop rotations.

Crop Rotation / Cropping Sequence	% age of area under cropping system	Total expenses (Rs)	Total yield of all crops (q/acre)*	Gross-income (Rs/acre)**	Net-income (Rs/acre)
Rice – cucumber + bitter gourd+capsicum+onion (Cucumber, capsicum and onion as inter-crop in bitter gourd)	37	1,28,000/-	309	3,30,550/-	2,02,550/-
Rice-cucumber+bittergourd+chilli +onion (Cucumber, chilli and onion as inter-crop in bitter gourd)	24	1,41,500/-	381	3,60,650/-	2,19,150/-
Early cauliflower – mid cauliflower + metha/ palak– cucurbits (leafy vegetables as inter-crop in mid-season cauliflower)	15	1,38,400/-	285	3,41,350/-	2,02,950/-
Rice – cucumber +tori / bottle gourd (sponge gourd / bottle gourd as relay-crop in cucumber)	14	1,21,750/-	327	3,13,950/-	1,92,200/-
Rice – cucumber +brinjal+onion (Brinjal and onion as inter-crop in cucumber)	10	1,34,900/-	402	3,19,800/-	1,84,900/-
Rice-wheat	80	30400/-	63	1,02,275/-	71,875/-

*Note: *This is the total yield of all the crops included in the cropping sequence.*
*** Gross income includes the total income from all the crops sown in the cropping sequence and to simplify the data in this table, the compiled income has been calculated.*

Table 3. Season-wise cauliflower production by vegetable growers in Malerkotla

Cauliflower season	Variety	Time of nursery planting	Time of transplanting	Period of availability (days after sowing)	Yield (q/ acre)
Early season	CFL 1522	May	June	60-65	50-70
Early to mid-season	Kavita, Early Kumari, Super Singra	June	July	60-70	60-70
Mid-season	Katki	June late	July	55-65	80-90
Mid- late season	Katki, Krishma, Maghri	Late July	August-September	60-70	100-110
Late season	Girja, Subhasini, Capsor, Jessica, SB 4051	End October-November	End November-December	70-75	110-125
Very late season	Lucky, Jyoti 1 &Jyoti 2	November	January	80-90	120-130

are found to hit the quality and quantity of the crop.

Among different vegetables, the cauliflower is found to be most common vegetable grown throughout the year which occupied around 24% of the total vegetable area in Malerkotla during the year 2019-20. The farmers have specific production periods and suitable varieties to that period (Table 3) as cauliflower is thermo-sensitive crop and the varieties differ in their temperature requirement for curd formation and development (Savita *et al*, 2014). The transplanting is mostly conducted on ridges 60 cm apart with plant to plant distance of 15 cm for early varieties with a total plant population of 24000-25000 per acre and the same is kept 75 cm x 20 cm during mid and late season with 20000 plants per acre. The market price varies from Rs. 25-30/ kg for early varieties, Rs. 10-12 for mid-season to Rs.4-5/kg for main/ late season but very late varieties have again fetch good price of Rs.10-15/kg. Although the farmers are fetching over 178 % more average net income from different vegetable based crop rotations than paddy-wheat, yet they have to bear some risks associated in production and marketing of their produce.

Impact on varietal adoption and techniques: The private sector has found to be very strong implications in approaching and convincing the farmers for the last many years and providing high yielding seeds of cucumber, bitter gourd, early chilli, capsicum, chappankadu, cauliflower, brinjal etc. But with the mentoring of PAU scientists in this area, the vegetable growers have diverted their mind to adopt the techniques, innovations and vegetable varieties as developed by the Punjab Agricultural University, Ludhiana. As more than 80% farmers in this area are small and also cultivate on leased-in-land, so it was very difficult for them to follow PAU techniques and varieties without any testing. When the scientists from PAU approached them in recent years, they inquired about the varietal performance and techniques and showed interest to conduct some of the demonstrations in their fields. Thereafter, many demonstrations were conducted like low tunnel techniques, planting method, weed control and varietal performance of chilli CH-27, brinjal PBHR- 41 & 42, PBH- 3, PBH - 4 & 5, PB Raunak and PB Bharpoor, onion PRO- 7 and pumpkin PPH-1 & PPH-2 at their fields for their convincing. Regular field visits and monitoring was also made to create confidence among them. All these tools have helped to proliferate the adoption of PAU recommended varieties among the farmers. The adoption of low tunnels technique has totally replaced the conventional method of sarkanda or paddy straw use and there is more than 960 acres area under this technology.

The vegetable growers are mostly habitual with application of pre-emergence herbicide namely Stomp 30 EC (Pendimethalin) in cauliflower, cabbage, okra, potato, peas, garlic, onion and tomato whereas they are also applying the Goal 23.5 EC (Oxyflourofen) in carrot, onion and garlic as per the recommendation of Punjab agricultural University (Anonymous, 2019). The intensive cultivation of vegetable crops either relay-cropping or inter-cropping has caused exhausting of the macro and micro nutrients in the soil. The soil testing reports have also shown the deficiency of trace elements like Zn, Mn, Mg, Ca, B etc. along with the organic carbon and phosphorus. The growers mostly use one trolley of poultry manure or 3-4 trollies of farm yard manure per acre to paddy crop in rotation randomly in fields. They have a common practice to apply 75-100 kg DAP per acre in almost vegetable crop rotations and inter-crops. The use of urea is very restricted in cucumber, okra, chilli, capsicum, brinjal and other cucurbits in which incidence of sucking pest is more and it is considered that the excessive nitrogen nutrient application may be the reason for the more attack of these insects. The application of urea has been recorded to 90-135 kg per acre in cauliflower and also in cabbage in

Table 4. Adoption level of PAU improved varieties of different vegetables in Malerkotla.

Crop	Varieties adopted	PAU varietal adoption (%)			Increase over 2016-17 year
		2016-17	2018-19	2019-20	
Onion	PB Naroya, PRO-6, PRO-7 (2020)	22.4	40.5	48.7	26.3
Garlic	PB-17 & 18	17.7	31.0	36.4	18.7
Brinjal	PB Neelam , PB Barsati, PB Long, PBH-3, PBH-4	31.2	46.3	56.3	25.1
Okra	PB-7, PB-8, PB-Suhawani	14.9	24.2	31.8	16.9
Chilli	CH-1, CH-27	16.5	59.0	68.0	51.5
Peas	PB-89, Ageta-7	37.2	95.0	96.0	58.8
Cucurbits	PB Komal, PB Naveen, Kali Tori, PB Barkat	42.1	61.2	64.7	22.6
Roots crops	PB Safed Mooli-2, PB Pasand, Japanese white, Pb Long Red	12.7	33.0	38.0	25.3

three split doses. The trace elements like Calcium and Boron in combination as per required quantity are frequently used in vegetables as foliar spray particularly in cucumber, bitter gourd and cauliflower.

Subsidies to the vegetable growers: Vegetable cultivation is very intensive as the cropping intensity is more than 300% and 3-4 crops are grown as inter-crops or relay crops and required more investment at initial stage. Secondly, vegetable hybrid seeds are costly and also intensive cultivation required more labour in all aspects. On the other side, mostly the vegetable growers are small and marginal farmer and they have also leased-in-land depending upon their economic conditions and some of them have land lease only. Therefore, the initial investment is not possible in the reach of these farmers. The public sector subsidies are not in the reach of such farmers and they have to dependent on commission agents or very rare on banks. The farmers, who have leased-in-land, can not avail the subsidies in their own accounts for different techniques, seed purchase and micro-irrigation and have too dependent on the owner of the land which cause difficulties to them. Keeping their long time experience and art of growing vegetable with good returns, the government should implement some policies to avail reasonable subsidies with some flexibilities for application.

Conclusion and Policy Implications

The Kamboj community in Malerkotla is well equipped with the vegetable cultivation system since the decades and they have robust confidence on their expertise in this profession. More than 76% growers are small and marginal farmers and even 6% of these farmers are landless but all are well engaged in vegetable cultivation. About 68 % of these families take land on lease in the vicinity of 10-12 kms of Malerkotla at different locations. The farmers of this vegetable hub have huge experience in vegetable production, good sharing with each other in crisis period, well established vegetable market which remains active from early hours to noon and again from 4.00 to 7.30 PM in evening and the involvement of entire family hard work in the field. Nearly, 82% of the growers have not to pay any loan and only 18 % have availed the loan facility. The small and marginal farmers of this hub are dependent on the commission agents for their petty needs without paying any interest. The choice to crops and varieties to be grown and acreage under a particular vegetable crop depends upon the market demand and requirements of commission agents. They have diverted their interest to public sector varieties and have 16- 59 % adoption level in different vegetable crops. They have totally replaced the sarkanda system with low-tunnel technique for early vegetable production which has also increased the area under winter vegetables. The weed control, manures, fertilizers and pesticide use are also being followed as per limits of the recommendations required. The government subsidies are not in the reach of these small and marginal farmers as they have mostly leased-in-land and face difficulty to avail this facility.

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Received: January 10, 2022 Accepted: May 18, 2022