A Study of Financial Health of Greenhouses and to Identify Problems Relating to The Greenhouse Operations with Special Reference to Kolhapur District, Maharashtra

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Abstract
India's economy is mostly dependent on agriculture, which also generates a signifi cant portion of the country's national income. When it comes to agricultural methods, tropical nations like India are believed to be more traditional than developed nations. In order to optimize their agricultural goods, the local farmers are unwilling to embrace technological advancements. The resource's ability to compete with the developed world is being hampered by this fundamental limitation on its total development. Keeping one's distance from time is becoming a crucial professional necessity. Consequently, a farmer must possess a broad and long-term commercial perspective. Traditional farming is not a profitable endeavor in the current climate due to the high costs of land, irrigation, fertilizer products, labor, electricity, and market fluctuations.
Now is the moment for farmers to use cutting edge technologies in order to increase yields and hence increase profitability. Thus, to increase yield and maintain consistent quality in commercial crops A high-tech greenhouse can transform the rural Indian landscape by generating high income, jobs, and turning farming into a company. Both quantitatively and qualitatively, greenhouse yields are thought to be superior. The ability to regulate temperature, humidity, carbon dioxide, and sunlight accounts for the excellent quality. The rationale behind this promising greenhouse technology is the creation of an artificial environment to maximize plant growth requirements in regulated conditions and to produce maximum yield in controlled space. The objectives of the research paper are To study the financial health of greenhouses. To identify problems relating to the greenhouse operations.
Indian farmers are now able to produce flowers of an international caliber. The fusion of modern technologies and customs is turning farmers become entrepreneurs. Aware of this, the majority of farmers in the Kolhapur district now utilize their greenhouses mostly for growing flowers. Because of this, it has the potential to become a center for agricultural growth and is listed by the state government as an export zone for commodities related to floriculture.

Keywords: Greenhouse, Financial health, horticulture, operations

Introduction

The need for a greenhouse stems from the need to avoid local restrictions, control harvesting times, produce high-quality, high-yield crops from small areas, and grow outside of the regular growing season under controlled growing conditions in the root area (temperature, moisture content, nutrition in the ground, soil PH, texture, and gases) and the plant area (temperature, humidity, light, air composition, and air movement).
The most practical method for achieving the objectives of protected agriculture is the greenhouse, wherein the natural environment is modified with the help of sound technical principles to guarantee the best possible plant development and productivity. In India, polyhouse farming has grown to be a significant agricultural strategy. The usage of greenhouse technology presents an opportunity to increase the yield per unit area through enhanced input utilization efficiency. Therefore, the employment of greenhouse/poly house technology can overcome this problem for horticulture production. Department of Horticulture, 2012). A greenhouse is a framed or inflated structure that is big enough to accommodate a person performing cultural operations inside and coated in a transparent or translucent material.
The South Maharashtra district of Kolhapur has been acknowledged as a pioneer in the use of greenhouse technology in agriculture. It is necessary to look into and evaluate the Kolhapur district's greenhouse distributional patterns. It is also advised to look into the input-output analysis of the crops cultivated. Another area of research is a comparative investigation of crop productivity inside and outside of greenhouses.
The reason why the greenhouse in a specific area of the district has been examined. Growing income greenhouse technology has had a positive effect on the socioeconomic structure of the area. Both agricultural and rural development in the study area can benefit from this technology.

Objectives of the Study:
1.To study the financial health of greenhouses.
2.To identify problems relating to the greenhouse operations.

Hypothesis of the Study:
H1. Financial health of greenhouses in Kolhapur District is Sound.
H2. There is significant association between production area of greenhouse and their profitability.
To test the hypothesis the statistical tools and techniques such as Chi-square test, Z-test, T- test and F-test etc. was calculated.

Research Methodology

Data Collection
To achieve the above objectives the study was completed using field survey method. In this field survey method, the researcher would approach promoters to fill up the questionnaire.
A. Nature and Source of Data:
The present study is based on both primary as well as secondary source of data.
1.Primary Data:-
The primary data are those which are collected afresh and for the first time. The first-hand information was collected by interviewing, questionnaire and observation of the greenhouse promoters. A questionnaire was prepared, pre-tested and finally administered.
2.Secondary Data:-
The secondary data are those which have already been collected by someone else and which have already been passed through the statistical process. It was collected from following sources
a.Information collected from District Agriculture Officer Kolhapur.
b.Visit to Shivaji University library, CSIBER library and Agriculture College library, Kolhapur.
c.Internet suffering.
Selection of Area and Sample Design / Size:-
1.Selection of Area: -
To carryout above mention study the researcher has selected the Kolhapur District, where the researcher was studying the greenhouse operations in 12 Taluka"sof Kolhapur District.
2.Sampling Design/ Size: -
There are total 369 Greenhouse under National Horticulture Mission in 12 Talukas of Kolhapur district. For the purpose of determining the adequacy of sample size from finite population, statistical formula stated by Taro Yamane was used. At 95% confidence level and confidence interval 5 the sample size has been 210 for the population of 369.
The percentage of sample of population has Formula=N/1+N(e)2
Where, n= Sample Size
N= Population (369)
e= Acceptable error (0.05)

Thus,
n= 210
Sampling Frame and sampling method. For the study purpose by adopting convenient sampling all 12 talukas in the district have been covered for conducting field survey.
Talukas wise greenhouses under NHM

Greenhouse / **Taluka**	**Total Greenhouse**
Karvir	61
Kagal	38
Shirol	46
Shahuwadi	04
Gadhinglaj	59
Hatkanangale	91

Panhala	20
Radhanagari	16
Chandgad	22
Bhudargad	04
Ajara	07
Gaganbawada	01
Total	369

Source: District Agriculture Office, Kolhapur.

The above table indicates the taluka-wise greenhouse project which is under National Horticulture Mission.

3.Sample Size and Method

For the study purpose, out of 369 greenhouses 210 greenhouse were selected from 12 talukas. Multi-level sampling has been done for the study of Kolhapur district greenhouses out of 35 districts of Maharashtra for study purpose by using convenient sampling and all 12 talukas in the district have been considered for conducting field survey. In second stage 210 greenhouse promoters have been selected by using convenient sampling method. And at grass root level these 210 respondents have been selected from all 12 talukas by using proportional sampling method.

Significance of the study:-

This study is helpful for getting knowledge about the greenhouse operations. “A study of Financial Viability of Greenhouse with special reference to Kolhapur district”

It is helpful for farmers for getting good qualitative and quantitative yield from greenhouses also this study was be helpful to know the farmers about the financial viability and then the farmer was decided whether the greenhouse is within our capacity or not, it’s also helpful to agriculture department to promote and create more awareness about greenhouse business. Ultimately this study was help to promote the implication of greenhouse technology in this study region.

Scope of the Study:-

The scope of the present study is classified in four different parts these are

1.Topical Scope:

The present study focused on the topic “A study of Financial Viability of Greenhouse with special reference to Kolhapur district”.

2.Geographical Scope

The researcher selected the sample of greenhouse from 12 talukas in of the Kolhapur district.

3.Operational Scope

The researcher selected the sample of greenhouse under National Horticulture Mission.

4.Functional Scope

The study is to suggest the remedial measures for managing and improving greenhouse operations in Kolhapur district at large.

Limitations Of Thestudy:

1.The present study is geographically limited to only Kolhapur District. Districts other than Kolhapur are not considered.

2.The study does not cover the greenhouse comes under National Horticulture Board.

3.The present study does not used censes survey method because the population is large and spread in all talukas of Kolhapur District.

1.Assess the financial Health of greenhouse

By adopting the modern technology of greenhouse, the difference in the demand and supply of off-season vegetables and fruits can be minimized. This facilitates maintaining of the quality of the product also. Crops cultivated in greenhouses are protected from the elements, such as severe rains and searing rays. They are also protected from wild animals such as birds. Evaporation has little effect on the humidity of the greenhouse, resulting in a lower water consumption. Insect and pest control is also simple and inexpensive in the greenhouse's small space. It is not only required to pay attention to the supply of manure and water to the plants and to protect them from illness in order to gain the most profit from the crops grown in the greenhouse, but it is also vital to pay attention to their marketing and selling of product. Taking into account the greenhouse's initial investment.

On the basis of market rates, income and spending can reduce or increase. To assess the financial health of greenhouse income and expenditure of greenhouse operations take into consideration. Greenhouse income means income earning from the crops grown in the greenhouse. These crops sales in market and getting money. Greenhouse promoters sales there product to Wholesalers and Retailers according to their demand of the product. Greenhouse expenditures means cost incurred in the operation of greenhouse. Expenditure includes variable cost and fixed cost Variable cost includes labor, fertilizers and spray, seeds, plant protection, packaging material, repairs and maintenance, electricity, marketing and commission, transportation and other cost. And fixed cost includes interest, depreciation and insurance.

Income statement for greenhouse operations (Up to 10 Gunthas)

Sr. No.	Particulars	Rs.
I	**Receipt**	
	Whole sales	395675
	Retail sales	112024
	Total Income	507699
II	**Expenditure**	
A	Variable Cost	
	Labour	38560
	Fertilizers and spray	32980
	Plants cost	15840
	Plant Protection	12620
	Packaging material	4865
	Repairs and Maintenance	3230
	Electricity	2980
	Marketing and Commission	1260
	Transportation	5650
	Other	1140
	Total Variable Cost	119125
	Gross Merging(I-A)	388574
B	Fixed Cost	
	Interest	62760
	Deprecation	22520
	Insurance	19774
	Total Fixed Cost	105054
	Total Expenses(A+B)	224179
	Net Income (I-II)	283520

Source: Based on Field Survey

The above table reveals the Average Receipt and Expenditure of the product grown in the greenhouse. The above table shows that all receipts are average cost of the whole product. A receipt includes wholesale and retail sales and expenditure of all 10 Guntas area of greenhouse construction i.e 141 greenhouses.
An assessment of cost of production includes various cost like.
1.Labour Cost – The cost of human labour in greenhouse is always more i.e Rs.38560. The promoters with a few labours can arrange different operations. For all item of controlled system labours in increasing number are required. This leads to the increase in the labour cost. Daily wages rate is more in study area so that the labour cost going to increased.
2.Fertilizers and spray- The cost for fertilizers and spray for Rs.32980. The cost of fertilizers and spray at open field and greenhouse farming are various significantly. In order to maintain healthy climatic conditions and to control diseases of plant timely doses of fertilizers are given to plants its useful to increased better quality and quantity of product. This leads to increasing cost for crop in greenhouse.
3.Plants cost- This cost is nothing but input cost the cost for plant in the greenhouse is Rs.15840. Tissues cultural plants are used in the greenhouse.
4.Plant Protection- plant protection means protecting the crop from the pests and diseases. for the plant protection cost Rs.12620. Crop protection is the collective concept of all measures that can be taken to protect crops against possible pests, diseases by combating or preventing the occurrence of these phenomena. In practice

every promoter or farmer makes use of a combination of measures.
5.Packaging material- different packaging material are used according to the different crops. Plastic small bags, box, rubber band, soft paper etc. for the packaging of the product average costRs.4865.
6.Repairs and Maintenance – the charges required for maintenances and repairing equipment like pumps, sprayers and other in greenhouse are Rs. 3230 in one year.
7.Electricity- In the greenhouse use fogger, mister and drip irrigation system with give to plant water soluble fertilizer the energy charges are increased. Electricity charges for greenhouse are Rs.2980.
8.Marketing and Commission cost- marketing and commission expenditure are Rs.1260 in study area. The marketing and commission agent expenditure of greenhouse farming in various market places are different.
9.Transportation cost- production of crops for greenhouse requires special market located at far distance like Mumbai, Hyderabad and Pune so transportation charges Rs.5650 are required. But some promoters sold greenhouse product in the nearby local market also.
10.Other cost-other cost required Rs.1140 to the greenhouse promoters for greenhouse operations. Other cost includes like Small parts of irrigation system and equipment's etc.
The total average variable cost of Rs. 119125 in study area. From the total income subtracts total variable cost is known as Gross Margin. Total Income cost for greenhouse produce goes up to Rs. 507699 and Total Variable cost are Rs. 119125. Subtract total variable cost from Total Income get Gross Margin i.e Rs. 388574

Fixed cost includes
1.Interest – The above table indicates that the interest on fixed capital for greenhouse construction average cost is required Rs. 62760 in study area.
2.Depreciation- as per above table average cost of depreciation required Rs. 22520 to the promoters for greenhouse operation.
3.Insurance- insurance is required for greenhouse for recurring the damage cost due to natural calamities. The average insurance cost is required in study area Rs.19774
Above table shows that average cost of income and expenditure in study area. As per above table average Total Cost includes average Variable cost and average fixed cost i.e Rs. 224179. When total cost subtract from total income getting the average net returns or income received from greenhouse are Rs. 283520 (Total Income- Total Cost = Net Income) (507699 - 224179 = 283520)

Income statement for greenhouse operations (From 10- 20 Gunthas)

Sr. No.	**Particulars**	**Rs.**
I	**Receipt**	
	Whole sales	1102250
	Retail sales	343330
	Total Income	1445580
II	**Expenditure**	
A	Variable Cost	
	Labour	117560
	Fertilizers and spray	90800
	Seeds	55680
	Plant Protection	37620
	Packaging material	12560
	Repairs and Maintenance	15620
	Electricity	17560
	Marketing and Commission	16530
	Transportation	20890
	Other	14057
	Total Variable Cost	398877
	Gross Merging(I-A)	1046703
B	Fixed Cost	
	Interest	172900
	Deprecation	87980
	Insurance	52106
	Total Fixed Cost	312986

	Total Expenses(A+B)	711863
	Net Income (I-II)	733717

Source: Based on Field Survey

The above table indicates that the Average Receipt and Expenditure of the product grown in the 20 Gunthas of greenhouse area total number of greenhouses are44. The above table shows that all receipts are average cost of the whole product. A receipt includes wholesale and retail sales and Expenditure includes Variable cost and Fixed Cost. The researcher takes average of income and expenditure of 44 greenhouses. The total Income includes whole sales and retail the total income is 1445580 and Total expenditure is 711863. So Net Income = Total income – Total expenses (733717=1445580-711863)

Income statement for greenhouse operations (From 20- 30 Gunthas)

Sr. No.	**Particulars**	**Rs.**
I	**Receipt**	
	Whole sales	1645600
	Retail sales	371600
	Total Income	2017200
II	**Expenditure**	
A	Variable Cost	
	Labour	146230
	Fertilizers and spray	96200
	Seeds	86320
	Plant Protection	46300
	Packaging material	26200
	Repairs and Maintenance	27560
	Electricity	25600
	Marketing and Commission	16050
	Transportation	18500
	Other	2950
	Total Variable Cost	491910
	Gross Merging(I-A)	1525290
B	Fixed Cost	
	Interest	210600
	Deprecation	150600
	Insurance	69450
	Total Fixed Cost	430650
	Total Expenses(A+B)	922560
	Net Income (I-II)	1094640

Source: Based on Field Survey

Above table shows that average cost of income and expenditure of 30 gunthas of area of greenhouse in study area. As per above table average Total Cost includes average Variable cost and average fixed cost i.e Rs. 922560. When total cost subtracts from total income getting the average net returns or income received from greenhouse are Rs. 1094640 (Total Income- Total Cost = Net Income) (2017200- 922560 = 1094640)

Income statement for greenhouse operations (From 30 - 40 Gunthas)

Sr. No.	**Particulars**	**Rs.**
I	**Receipt**	
	Whole sales	1896500
	Retail sales	301967
	Total Income	2198467
II	**Expenditure**	
A	Variable Cost	

	Labour	156890
	Fertilizers and spray	98200
	Seeds	81600
	Plant Protection	48130
	Packaging material	25600
	Repairs and Maintenance	28960
	Electricity	29600
	Marketing and Commission	18490
	Transportation	20500
	Other	2510
	Total Variable Cost	510480
	Gross Merging(I-A)	1687987
B	Fixed Cost	
	Interest	226500
	Deprecation	160100
	Insurance	93433
	Total Fixed Cost	480033
	Total Expenses(A+B)	990513
	Net Income (I-II)	1207954

Source: Based on Field Survey

The table denotes the Income statement for greenhouse operations for 40 gunthas. The income statement shows that Receipt includes whole sales and retail sales and Expenditure includes variable cost and fixed cost. The above table shows that Net Income = Total Income minus Total expenses (1207954=2198467-990513)

2.Assess the problems faced by farmers relating to greenhouse operations

There are various benefits received by greenhouse but this farming have some limitations its create some problem. The researcher has also asked different problems like Problem Faced about Climate and Infrastructure, Problem Faced about Labour, Problem Faced about Management, Problem Faced about Finance, Problem Faced about Marketing etc. they faced problem while doing greenhouse farming. The responses of greenhouse promoters are given in the table

Problem Faced In Operating Greenhouse System

Plantation System	**Frequency**	**Percent**
Yes	210	100.00
No	00	00.00
Total	210	100.00

Source: Based on Field Survey

The table denotes the opinion about Problem Faced In Operating Greenhouse System. The above table determines that all 100% (210) promoters are Faced problem in Operating Greenhouse System.

Problem Faced about Climate and Infrastructure

Sr. No.	**Problem about**	**SD**	**D**	**N**	**A**	**SA**	**Total**	**P.V**	**Mean**	**V**
		1	**2**	**3**	**4**	**5**				
1	Seasonal Problem (i.e Change in climate)	00	00	54	452	395	901	85.81	4.29	0.38
2	Frost problem	00	182	63	392	00	637	60.67	3.03	0.90
3	Unavailability of shade net , polyfilm	00	216	96	280	00	592	56.38	2.82	0.82

4	Irrigation problem	00	00	39	568	275	882	84.00	4.20	0.29
5	High diseases	00	00	57	512	315	884	84.19	4.21	0.35
6	Lack of technology availability	00	120	72	504	00	696	66.29	3.31	0.79

Source: Based on Field Survey

1)The promoters are agreed for the statement about Seasonal Problem (i.e Change in climate) The favorable response has given the promoters because the total score is 901 i.e. 85.81 percentile value and mean is 4.29. The variance is 0.38 and it shows in the less variability of data. Thus, it is concluded that the most of the promoters agree that Seasonal Problem (i.e Change in climate)
2)The favorable response has given by greenhouse promoters for the statement on providing Frost problem. It means promoters give the positive response about frost problem. The total score is 637 with 60.67 percentile values & mean is 3.03; there is a less variability of data because variance is 0.90. If mean is 3 or more than 3 it shows favorable attitude of greenhouse promoters regarding
3)Another statement regarding Unavailability of shade net, polyfilm. The total score is 592 i.e. percentile value is 56.38 and the mean is 2.82 The variance is shown that the more consistency of response to this statement i.e. 0.82. If mean is less than 3 it shows unfavorable attitude of greenhouse promoters regarding unavailability of shade net, polyfilm
4)The next statement Irrigation problem. For this statement promoters have given the favorable response, because total score is 882 with percentile value is 84.00 and 4.20 mean value. The variance is shown that the consistency of data, i.e. 0.29. Thus, it is concluded that the greenhouse promoters are agreeing to this statement because they face irrigation problem.
5)There is a favorable response given by the promoters of the statements about Highdiseasesproblemfaceingreenhousecrops.Thetotalscoreis884i.e.
84.19 percentile value & mean is 4.21. But the data have consistency because variance is 0.35. Thus, the observed that greenhouse promoters are agreed about they can face high diseases in greenhouse during growing of crops.
6)The favorable response has been given by the promoters for they can face Lack of technology availability problem. The total score is 696 and percentile value is 66.29. The mean is 3.31 & variance is 0.79. It shows that greenhouse promoters are agreed that impact of Lack of technology availability. It means
3 or more than 3 it shows favorable response of greenhouse promoters regarding Lack of technology availability problems.

Problem Faced about Labour

Sr. No.	**Problem about**	**SD**	**D**	**N**	**A**	**SA**	**Total**	**P.V**	**Mean**	**V**
		1	**2**	**3**	**4**	**5**				
1	Unskilled employees	00	74	54	620	00	748	71.24	3.56	0.60
2	Lack of Knowledge about packaging	00	298	66	156	00	520	49.52	2.48	0.62
3	Lack of knowledge about using from proper fertilizers	00	6	48	592	215	861	82.00	4.10	0.33
4	More worker required	00	260	57	244	00	561	53.43	2.67	0.81
5	Unavailability of training facility to the workers	00	232	135	196	00	563	53.62	2.68	0.69

Source: Based on Field Survey

1)The greenhouse promoters have given a favorable response to face unskilled employees problem in study area. Because total score is 748 with 71.24 percentile value & mean is 3.56. There is more uniformity of data because variance is 0.60. It means promoters are agreed about the impact of unskilled employees. If mean is 3 or more than 3 it shows favorable response of greenhouse promoters regarding this statement.
2)There is a unfavorable response from promoters for Lack of Knowledge about packaging. Because total score is 520 i.e. 49.52 percentile value & mean is 2.48. The variance is 0.62 and it shows that the consistency of data. Thus, it is concluded that the greenhouse promoters negative attitude towards this statement. If mean is less than 3 it shows favorable response of greenhouse promoters regarding this statement.
3)After the next statement Lack of knowledge about using from proper fertilizers has received more favorable view from greenhouse promoters because its total score is 861 i.e. 82.00 percentile value, mean is 4.10 and

variance value is 0.33. If the variance is less than 1 it shows the more consistent or less variability or greater uniformity in the response given by respondents. There is more contribution of agree and agree strongly opinion in total score, it evince more favorable attitude of greenhouse promoters for lack of knowledge about using proper fertilizer.

4)After the next statement is More worker required. The total score is561with 53.43 percentile values and mean is 2.67. Variance is 0.81. If mean is less than 3 it shows favorable response of greenhouse promoters regarding this statement.

5)There is a unfavorable response from promoters for Unavailability of training facility to the workers .Because total score is 563 i.e. 53.62 percentile value & mean is 2.68. The variance is 0.69 and it shows that the consistency of data. Thus, it is concluded that the greenhouse promoters negative attitude towards this statement. If mean is less than 3 it shows favorable response of greenhouse promoters regarding this statement.

Problem Faced about Management

Sr. No.	Problem about	SD	D	N	A	SA	Total	P.V	Mean	V
		1	2	3	4	5				
1	Lack of Knowledge of Government schemes	00	164	123	348	00	635	60.48	3.02	0.81
2	Complicated procedure for receiving subsidy	00	00	27	640	205	872	83.05	4.15	0.22
3	Poor management and maintains of greenhouse	00	122	33	428	155	738	70.29	3.51	1.13
4	Only limited products produced in greenhouse	00	00	30	568	290	888	84.57	4.23	0.27
5	Lack of knowledge about maintain records	00	00	63	324	540	927	88.29	4.41	0.45

Source: Based on Field Survey

1.There is a favorable attitude regarding Lack of Knowledge of Government schemes because its total score is 635 with percentile value 60.48and mean of
3.02. The variance of this statement is 0.81 it indicates that there is less variability in the responses of greenhouse promoters on this statement.

2. The statement about Complicated procedure for receiving subsidy have total score 872 with percentile value of 83.05 and mean 4.15 it shows the favorable responses of greenhouse prompters for complicated procedure for receiving subsidy. The variance is 0.22 it shows that there is higher variability in the promoters responses on this statement.

3)The total score of the statement about Poor management and maintains of greenhouse have favorable responses. Because its total score is 738 and 70.29 percentile value as well as mean value of 3.51. The responses on this statement have more variability because its variance is1.13.

4)There is favorable response on the statement regarding only limited products produced in greenhouse. Because its total score is 888 with 84.57 percentile value and 4.23 mean score. The 0.27 variance of this statement denotes that there are less variations in the responses of the respondents on this statement.

5)There is favorable response on the statement of Lack of knowledge about maintain records have total score 927 with percentile value of 88.29 and 4.41 mean score. The variance is i.e. 0.45 it indicates the less variations in the responses.

Problem Faced about Finance

Sr. No.	Problem about	SD	D	N	A	SA	Total	P.V	Mean	V
		1	2	3	4	5				
1	Insufficient financial by support by government	00	154	138	348	00	640	60.95	3.05	0.78
2	High investment in greenhouses	00	00	48	188	735	971	92.48	4.62	0.39
3	Less financial support from bank and financial institutions	00	254	87	216	00	557	53.05	2.65	0.75
4	High requirement of working capital	00	00	48	508	335	891	84.86	4.24	0.34

5	Heavy expenditure on infrastructure, equipment, labour and raw material	00	00	99	592	145	836	79.62	3.98	0.30

Source: Based on Field Survey

1)The statement has favorable response of Insufficient financial by support by government have total score 348 with percentile value of 60.95 and 3.05 mean score. It shows that this statement has received favorable responses from promoters. The variance i.e. 0.78, it indicates the less variations in the responses.
2)The total score is 971 with percentile value 92.48 and mean 4.62 of the statement about High investment in greenhouses. It shows the favorable responses of the respondents. The variance is 0.39 which are shows more consistence in the responses of greenhouse promoters on this statement.
3)There is a favorable response on the statement about Less financial support from bank and financial institutions. Because the total score is 557 with 53.05 percentile value and 2.65 mean score. This statement has also less variations in the responses of greenhouse promoters because its variance is0.75.
4)The statement about High requirement of working capital. Have received favorable responded because its total score is 891 with 84.86 percentile value and 4.24 mean score. The variance 0.34 shows the consistence in the responses of greenhouse promoters on this statement also.
5)There is favorable responses has been received on the statement Heavy expenditure on infrastructure, equipment, labour and raw material. Because its total score is 836 with 79.62 percentile value and 3.98 mean score. There are less variations in the responses of the respondents because its variance is0.30.

Problem Faced about Marketing

Sr. No.	**Problem about**	**SD**	**D**	**N**	**A**	**SA**	**Total**	**P.V**	**Mean**	**V**
		1	**2**	**3**	**4**	**5**				
1	No local market availability	00	30	90	540	150	810	77.14	3.86	0.55
2	Lack of knowledge about marketability	00	00	114	428	325	867	82.57	4.13	0.48
3	Lack of knowledge about export market	00	00	00	172	835	1007	95.90	4.80	0.16
4	Transportation problems faced	00	252	81	228	00	561	53.43	2.67	0.77
5	Pricing problems	00	00	42	552	290	884	84.19	4.21	0.30

Source: Based on Field Survey

1)The problem face about No local market availability is have favorable responses. The total score is 810 with 77.14 percentile value and 3.86 mean score. The variance 0.55 indicates that there is more consistency in the responses of the greenhouse promoters.
2)The next statement is Lack of knowledge about marketability has received favorable responses because its total score is 867 with 82.57 percentile value and 4.13 mean score. There is less variability in the responses of greenhouse promoters because its variance is0.48.
3)The total score of the statement about Lack of knowledge about export market have favorable responses. Because its total score is 1007 and 95.90 percentile value as well as mean value of 4.80. The responses to this statement have less variability because its variance is0.16.
4)There is an unfavourable response on the statement regarding Transportation problems faced. Because its totalscoreis561with 53.43 percentilevalueand
2.67 mean score. The 0.77 variance of this statement denotes that there are less variations in the responses of the respondents on this
5)The last statement is Pricing problems has received favorable responses because its total score is 884 with 84.19 percentile value and 4.21 mean score. There is less variability in the responses of greenhouse promoters because its variance is0.30.

HYPOTHESIS1:- Financial health of greenhouses in Kolhapur District is Sound
H0- Financial health of greenhouses in Kolhapur District is not Sound.
Ha- Financial health of greenhouses in Kolhapur District is Sound.

	Test Value = 0	

	Table Value („t“ Value)	Df	Sig.(2-tailed) („p“ Value)	Mean Difference	95 % Confidence Interval of the Difference		Result
					Lower	Upper	
Financial Health of Greenhouses	21.414	209	.000	482502.857	438084.03	526921.68	**Reject H0**

The researcher has used one sample t test for testing this hypothesis. The „p“ value for the financial health of greenhouses is 0.000, which is less than the significant value, i.e. 0.05 („p“ value < 0.05), so we reject the null hypothesis and the alternative hypothesis is accepted. It means that the financial health of greenhouses in Kolhapur District is Sound. The researcher has used a table for testing this hypothesis

HYPOTHESIS2: There is a significant association between the production area of greenhouses and their profitability

The researcher has used the Chi-square () test and cross-tabulation for this hypothesis. Because the Chi-square () test is used to discover the relationship between two categorical variables (Garczynski). The researcher has used two categorical variables that consist of two or more categorical and independent groups. The Chi-square () test of independence is also called as Pearson's Chi-square () test.

The researcher has presented the null hypothesis. They are as follows;

H0- There is no significant association between the production area of greenhouses and their profitability.

Ha- There is a significant association between the production area of greenhouses and their profitability.

Here, the Chi-square ($\chi 2$) test has been used for testing association between the production area of greenhouses and their profitability.

Production Area wise Profitability of Greenhouse

Profitability (Net Income)	**Area of Greenhouse Construction**				**Total**
	10 Gunthas	**20 Gunthas**	**30 Gunthas**	**40 Gunthas**	
Below 200000	15	4	1	1	21
200001 to 400000	80	22	5	7	114
400001 to 600000	12	4	0	0	16
600001 to 800000	9	7	2	2	20
800001 to 1000000	7	4	0	1	12
1000001 to 1200000	11	2	2	0	15
1200001 to 1400000	7	1	0	4	12
Total	141	44	10	15	210

Chi-Square Tests for Association between Production Area and Profitability of Greenhouse

	Value	**df**	**Asymp. Sig. (2-sided)**	**Exact Sig. (2-sided)**
Pearson Chi-Square	29.307a	18	.093	.031b
Likelihood Ratio	23.971	18	.156	.130b
Fishers“ Exact Test	23.591			.043b
Linear-by-Linear Association	3.458	1	.063	.229b
N of Valid Cases	210			

a.18 cells (64.3%) have expected count less than 5. The minimum expected count is.57.

b.Based on 10000 sampled tables with starting seed624387341.

As a result of Fishers Exact Test, the P-value (0.043) is less than significance level 0.05. The Chi-square ($\chi 2$) test gives the same result because the computed value (29.307a) of X2 is greater than the table value (28.869) of X2at df18 at

0.05 significance level. Here, H0is rejected and H1is accepted hence, conclude that there is an association between production area of greenhouses and their profitability.

Findings Related to assess the financial Health of greenhouse

It is found that to assess the financial health of greenhouse income and expenditure of greenhouse operations take into consideration. Greenhouse income means income earning from the crops grown in the greenhouse. Greenhouse expenditures means cost incurred in the operation of greenhouse. Expenditure includes variable cost and fixed cost Variable cost includes labor, fertilizers and spray, seeds, plant protection, packaging material, repairs and maintenance, electricity, marketing and commission, transportation and other cost. And fixed cost includes interest, depreciation and insurance.

1.The researcher takes that all receipts are average cost of the whole product. A receipt includes wholesale and retail sales and expenditure of all 10 Guntas area of greenhouse construction i.e 141 greenhouses. As per the table average Total Cost includes average Variable cost and average fixed cost i.e Rs. 224179. When total cost subtract from total income getting the average net returns or income received from greenhouse are Rs. 283520 (Total Income- Total Cost = Net Income) (507699 - 224179 = 283520)

2.Average Receipt and Expenditure of the product grown in the 20 Gunthas of greenhouse area the total number of greenhouses are 44. The total Income includes whole sales and retail the total income is 1445580 and Total expenditure is 711863. So Net Income = Total income – Total expenses (733717= 1445580-711863)

3.Average cost of income and expenditure of 30 gunthas of area of greenhouse in study area. There are total 10 greenhouse promoters cultivating crops under 30 gunthas. average Total Cost includes average Variable cost and average fixed cost i.e Rs. 922560. When total cost subtract from total income getting the average net returns or income received from greenhouse are Rs. 1094640 (Total Income- Total Cost = Net Income) (2017200- 922560 = 1094640)

4.The Income statement for greenhouse operations for 40 gunthas. The income statement shows that Receipt includes whole sales and retail sales and Expenditure includes variable cost and fixed cost. The above table shows that Net Income = Total Income minus Total expenses (1207954= 2198467- 990513)

Findings Related to the problems faced by farmers relating to greenhouse operations

1. Problem Faced about Climate and Infrastructure.

1.There is a most favorable response from the respondent about statements on Problem Faced about Climate and Infrastructure i.e. about Seasonal Problem, providing Frost problem, Irrigation problem, about High diseases problem face in greenhouse crops, Lack of technology availability problem have received favorable response from the respondent. The mean score of these statements is in between 3.00 to 4.00 also indicate the favorable attitude towards about statements on Problem Faced about Climate and Infrastructure.

2.The statement on Unavailability of shade net, poly film have received unfavorable response from promoters. The means core of this statement is
2.82.

2. Problem Faced about Labour.

1.Same statement like Lack of Knowledge about packaging, More worker required, Unavailability of training facility to the workers have received unfavorable response from respondent.

2.And other two statement have favorable response from promoters i.e They face unskilled employees problem.

3. Problem Faced about Management

1. There is a most favorable response from the respondent about statements Lack of Knowledge of Government schemes, Complicated procedure for receiving subsidy, Poor management and maintains of greenhouse, Only limited products produced in greenhouse. Lack of knowledge about maintain records. The mean score of these statements is more than 4.00 also indicate the most favorable attitude towards Problem Faced about Management

4. Problem Faced about Finance

1. The statement on Insufficient financial by support by government, High investment in greenhouses, High requirement of working capital, Heavy expenditure on infrastructure, equipment, labour and raw material have received favorable response from the respondent. The mean score of these statements is in between 3.00 to 4.00 also indicate the favorable attitude towards about statements on Problem Faced about Finance.

2. Less financial support from bank and financial institutions these statements have unfavorable response from promoters because mean score of this statement is 2.65.

5. Problem Faced about Marketing.

1.No local market availability, Lack of knowledge about marketability, Lack of knowledge about export market, Pricing problems these statement have positive attitude from promoters because the mean score of these statements is in between 3.00 to 4.00.

2.The statement on Transportation problems faced have received unfavorable response from the respondent.

Findings based on Hypotheses testing

1.The 'p' values for Financial health of greenhouses is 0.000, which is less than the significant value i.e. 0.05 it means that the financial health of greenhouses in Kolhapur District is Sound.

2.As a result of Fishers Exact Test, the P-value (0.043) is less than significance level 0.05. This shows that there is an association between production area of greenhouses and their profitability.

Conclusion

To assess the financial health of greenhouse income and expenditure of greenhouse operations take into consideration. Greenhouse income means income earning from the crops grown in the greenhouse. These crops sales in market and getting money. Greenhouse promoters sales there product to Wholesalers and Retailers according to their demand of the product. Greenhouse expenditures means cost incurred in the operation of greenhouse. Expenditure includes variable cost and fixed cost Variable cost includes labor, fertilizers and spray, seeds, plant protection, packaging material, repairs and maintenance, electricity, marketing and commission, transportation and other cost. And fixed cost includes interest, depreciation and insurance. Assess the problems faced by farmers relating to greenhouse operations. There are various benefits received by greenhouse but this farming have some limitations its create some problem. The researcher has also asked different problems like Problem Faced about Climate and Infrastructure, Labour, Management, Finance and Marketing etc. The financial health of greenhouses in Kolhapur District is Sound. The analysis also indicates that there is an association between production area of greenhouses and their profitability in third hypothesis of the product. Greenhouse expenditures means cost incurred in the operation of greenhouse. Expenditure includes variable cost and fixed cost Variable cost includes labor, fertilizers and spray, seeds, plant protection, packaging material, repairs and maintenance, electricity, marketing and commission, transportation and other cost. And fixed cost includes interest, depreciation and insurance.

The researcher has been used one sample t test, Chi-Square test and fishers exact test for testing the hypotheses of study. The results of hypotheses testing show thatsecond hypothesis its show that the financial health of greenhouses in Kolhapur District is Sound. The analysis also indicates that there is an association between production area of greenhouses and their profitability in third hypothesis

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