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The Case of Polyhouse Farming

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Public Policy Research Institute
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Sustainable Vegetable Cultivation in Kerala: The Case of Polyhouse Farming

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Abstract

Kerala is largely dependent on neighbouring states for its dietary vegetable requirements of the population. To overcome the inherent limitations of land and labour and also promote safe to eat vegetables, there has been an enhanced support to Hi-tech or polyhouse cultivation. This study explores a few dimensions of Hi-tech farming practices in Kerala. An important component of the exercise is to estimate the cost, subsidy and returns from polyhouses across the major regions in Kerala. The field survey conducted across six districts reveal that beneficiaries ended up incurring significantly higher establishment cost for a polyhouse than what was estimated by the government. Given the limited number of crops coupled with constraints in marketing and lack of realization of any premium over other vegetables beneficiaries find it difficult to sustain polyhouse farming. Instituions ought to be proactive in fixing a more realistic cost of the structure and facilitate marketing in terms of propagating the product as 'safe to eat' and thereby making the farmers realize a premium. The study recommends that existing polyhouse farmers should be offered support on a continuous basis and the new initiatives may be facilitated only after a careful examination of realistic costs involved, suitability to the general weather conditions and market situations.

Keywords: Hi-tech agriculture, polyhouse farming, cost of cultivation, institutional support

JEL Classification: **Q10**; **Q12**; **Q16**

Introduction

Horticulture sector in India provides diverse opportunities in raising the income of the farmers. There is a sustainable increase in production and productivity of horticultural crops owing to release of improved varieties and hybrid seeds and adaptation of improved farming technologies. Use of greenhouse or polyhouse technology (referred to as Hi-tech Farming) started only during 1980's and it was mainly used for research activities. However, in recent years, the current growth in consumption, wider market access and the policies in promoting exports have resulted in an enhanced adoption of Hi-tech farming.

Vegetables are grown in many states of the country under varied agro-climatic condition in plains as well as in hilly regions. They provide an important source of income for the small and marginal farmers in the state. In India, as per the 2011 statistics, 13.08 per cent of area is under horticultural crops. India is the second largest producer of fruits and vegetables in the world next to China, with a share of 10 per cent of total world population. Production of fruits and vegetables has increased from 87.16 million tonnes in 1991-92 to about 225.42 million tonnes in 2010-11 (Indian Horticulture Database, 2011). The National Committee on the use of Plastics in Agriculture (NCPA-1982) has recommended location specific trials of greenhouse technology for adoption in various regions of the country.

This study explores a few dimensions of Hi-tech farming practices in Kerala such as institutional support, comparative analysis of cultivation and returns from Hi-tech and open farm and issues in marketing. The farmer typically would compare the cost and returns over a period from a Hi-tech unit (which implies significantly higher investment) to that of open field farm area (where investments and risks are on the lower side). The study intends to document the profile of adoption across the state and investigate the enabling policy and implementation related factors that make polyhouse vegetable farming viable across major regions with specific reference to providing a sustainable future in establishing self sufficiency for the state in vegetables. Thus, besides documenting the pattern of adoption in Kerala, the specific objectives of the study are;

1. Explore how institutions are supportive across Kerala in terms of establishing a polyhouse, input supply and marketing to suggest appropriate interventions/ policy measures
2. Estimate the cost, subsidy and returns from polyhouses across the major regions in Kerala

The study is conducted across major regions of Kerala through a sample survey. Sampling is done based on the prevalence of polyhouses in various districts across the state. A total of 52 farmers engaged in polyhouse vegetable cultivation are surveyed. Snowball

sampling method is adopted as the farmers' database is not updated and some of the listed farmers had stopped vegetable cultivation in the specified unit. The calculation of cost of cultivation is based on the Cost of Cultivation Manual adopted by the Ministry of Statistics and Programme Implementation. The rest of the paper is organized as follows. Section two provides a background to the sector in India in general and discusses specific policy initiatives in the context Hi-tech vegetable farming in Kerala. Third section deals with the economics of polyhouse farming across the major selected regions. It delineates various cost components and provides an overview of the viability of polyhouse farming. The fourth section concludes with policy recommendations.

2. Vegetable Cultivation in Kerala: Some Trends and Evolving Hi- tech Farming

Kerala is a state in southern India and there is constant demand for eclectic mix of vegetables for home consumption. In terms of agro-climatic conditions Kerala has a warm and humid climate with a heavy and long drawn monsoon. The typical vegetables grown are beans (cowpea, cluster, broad), gourds, pumpkins, cabbage, cauliflower, cucumber, tomatoes, etc. The vast tracts of land available earlier were dominated by plantation crops such as rubber, coffee and various spices as they offered a higher return on commercial scale. Secondly, the agro climatic conditions also influenced the pattern of agricultural practices

and type of crops grown. There are coastal areas with higher temperature and humidity and rice is predominantly grown. The mid land grows more vegetables and the hilly areas largely grow plantation crops.

However, Kerala largely depends on neighbouring states for its dietary vegetable requirements of the population. There are a few reasons for this phenomenon. First, the scarcity of land available for large scale commercial cultivation prevented the growing of vegetables, and shortage of labour during crucial farm operations further exacerbate the problem. Recent government crackdown on pesticide-infested vegetables from neighbouring states had caused a household-level awareness on forming a wide string of kitchen gardens. In the context of severe land fragmentation, non availability of labour for the timely completion of farm activities and pesticide infestation of vegetables gave rise to the idea of polyhouse farming which requires smaller area of land, family labour and bio-water soluble inputs. The adoption of polyhouse or open field cultivation, which have varying production costs and returns levels are also influenced by factors such as availability of information, technical support system, etc. However, many farmers considered polyhouse farming as the right option due to food safety, and expectation of higher returns among other things, except the fact that only very limited crops can be grown in polyhouses. Salad cucumber is the most dominant crop being grown and this is followed by cowpea beans, amaranths, bitter gourd, etc.

Though the produces are still not pure organic, they can generally be categorized as 'safe to eat' and there is a growing group of consumers coming forward and willing to pay a premium for safe to eat vegetables. Of late, it is claimed that the quantum of vegetables through trucks from neighbouring states has come down from somewhere over 750 trucks per day, to 400 trucks per day (Financial Express, 2016). There has been a continuous drive on both awareness building about food safety issues as well as campaign to attain self sufficiency in vegetables through promoting backyard vegetable nurseries and Hi-tech agriculture across the state. As per the estimates of the Department of Agriculture, Government of Kerala, the state requires 20 lakh tones of vegetables for consumption by 2020-21 (Directorate of Agriculture, 2016).

2.1. Hi tech Polyhouse Farming and Institutional Support in Kerala

Growing of crops in green houses has proved to be the best way of utilizing the crops potential. Computerized control of irrigation, fertilization (Fertigation) and microclimate in green house enable precise monitoring of the most important production practices. In temperate regions where the climatic conditions are extremely adverse and no crops can be grown high value crops can be grown continuously by providing protection from the adverse climatic conditions such as wind, cold, precipitation, extreme temperature, insects and diseases through Greenhouse Technology. Polyhouses are made popular by Israel and

the Netherlands – countries with extreme weather and soil conditions. Polyhouses are made of transparent and flexible polythene. This enables cultivation of vegetables and other crops in any season of the year depending upon their requirement, because temperature and humidity can easily be controlled in Polyhouses as they prevent the thermal radiation from escaping which increases the temperature and energy and thus helps in the process of photosynthesis. It is well established that for the production of vegetable, fruits and flower crop, the polyhouses are constructed with the help of ultraviolet plastic sheets, so that they may last for at least five years. Hi-tech and precision farming has to do more with the precise application of agricultural inputs based on soil, weather and crop requirement to maximise sustainable productivity, quality and profitability. Hi-tech Agriculture is one method of precision farming on a smaller scale where plant protection and fertigation are applied at the root zone and plants are grown in precise conditions of temperature and humidity for uniformity and maximisation of yield.

Polyhouse vegetable cultivation in Kerala is highly concentrated on two vegetables - salad cucumber and cowpea beans. This is primarily reported to be due to the fact that only non pollinated varieties can be grown as the plants are secured from all types of insects in a polyhouse set up (insects carry pollens as well). This, in effect, restricts polyhouse

farming to a few vegetables such as salad cucumber, tomato and cowpea beans.

The Department of Agriculture and the allied organizations such as Horticorp and Mission for Integrated Development of Horticulture (MIDH) have been in the forefront of these initiatives. There are various schemes through which promotion of sustainable vegetable cultivation is done. The National Bank for Agriculture and Rural Development (NABARD) was also involved in supporting a few projects of Hi-tech Agriculture. The Government of Kerala through the line Departments of Agriculture and Horticulture and the National and State Horticulture missions are also supporting polyhouse construction in a big way through various subsidies. A more energetic initiative was seen in the development of a comprehensive state agriculture policy in 2015 which had specific measures to promote Hi-tech agriculture (village resource centre, satellite mapping, precision agriculture, climate controlled and ventilated greenhouse farming, etc). Of these, polyhouse farming initiative was given a boost as the district administration and gram panchayaths were prompted to construct a polyhouse on government owned land and insisting at least three polyhouse vegetable cultivation units in a gram panchayath. Polyhouse vegetable farming is considered to answer many of the dilemmas the state face in terms of availability of suitable land and labour. A Polyhouse can be constructed in a small piece of land , intensive cultivation implies that there are multiple crop cycles in a year,

providing higher yield compared to traditional methods and labour requirements are limited in a constricted space and may be managed through family labour a couple of hours every day, thus ideally ticking all the right boxes. A polyhouse can be constructed on the terrace of a house, or independently on a piece of land and Kerala has a variety of such polyhouses constructed, implying that even a piece of land is not a necessary requirement if there is at least 400 square metres of terrace of a concrete house.

There are various types of polyhouses found in Kerala, set up with the objective of intensive and climate controlled agricultural production. Naturally ventilated polyhouses are very popular and the scheme is designed particularly to encourage the adoption of such polyhosues. Initially (during 2009-10), the proportion of subsidy was limited to 50 percent of the cost of construction which was later enhanced to 75 percent thus, the farmer has to bear only one fourth of the financial burden. The technical support system was not augmented enough to orient and handle the adoption and sustainability of polyhouses in the state. Later the state department augmented the capacity in order to provide at least one expert in each block. There are various schemes through which promotion of Hi-tech vegetable cultivation is done. The National Bank for Agriculture and Rural Development is also involved in supporting a few projects of Hi-tech Agriculture. The Government of Kerala through the Departments of Agriculture and Horticulture and

the National and State Horticulture missions are also supporting poly house construction in a big way through various schemes and subsidies. Led by MIDH (Hi-tech farming, Vegetable Development Programme) and financed jointly with RKVY (Centre), providing upto 75 percent subsidy to vegetable growers in Kerala. During 2014-15 sanction was granted to establish Green House (Naturally Ventilated Tubular Structured Polyhouse) units following MIDH norms. 75 percent of the unit cost was provided as subsidy. Out of this, 50 percent of the assistance was from the provision made under Approved Annual Action Plan of MIDH and 25 percent provided Government of Kerala. The balance amount (25 percent of the total) has to be borne by the beneficiary. Ventilated polyhouses in Kerala are of two major types, Gable and Sow tooth. The costs of construction of them vary by a few hundred rupees per square metre. This has resulted in some of the beneficiaries incurring significant additional expenses and their subsidy component in real terms comes to less than 50 percent. Provision of construction equipment and raw materials and expertise were through private agencies of Tamil Nadu and Karnataka, only later agencies within the state started to assist the farmers, but most of them a premium, much higher than the rate fixed by the SHM. The involvement of initial capital was huge and this still remains as the principal reason behind the low rate of adoption across the state, adding further to the woes is the absence of a niche market for polyhouse output and most producers

do not realize any premium over the non polyhouse produce of the same market.

Kerala Government's comprehensive agriculture development policy lays specific emphasis on Hi-tech polyhouse farming. This is evident from the policy document of 2015. The Policy states that widespread promotion of Hi-tech agriculture is important as climatic extremes are affecting normal cultivation. Further, it describes that starting with a market study to determine the crops that will fetch a good price in a particular season and go for Hi tech farming of the same would assure huge profits to farmers. Lastly, it proposes that the produces got from polyhouses could be branded as safe to eat since they are produced in insect free conditions which eliminate the chance of using pesticides. However, the specific guidelines on promoting and implementing the policy has been lacking in Kerala.

Kerala Agriculture Statistics (2014) brought to light that in the total cost of cultivation, labour charges was almost half which is the highest among the item wise cost division. The observation that cost also varies as per the size of the holding does not seem to be the case with polyhouse farming. Sreedhara, *et al.* (2013) elaborates on the fixed and variable cost components of protected polyhouse cultivation and corroborates the typical finding that labour cost is around half of the total variable costs of cultivation. Yadav, *et al*. (2014) further corroborates this situation.

However, Kerala's agro-climatic factors and their influence on the adoption of polyhouses and the advisory, supervisory and technical support from government have not been studied so far. Thus, questions remain on the suitability and sustainability of this model as there are several influencing factors. Currently, there have been cases of heavy loss for some farmers, at the same time, successful cases exist side by side. As the government plans to promote pesticide free vegetables, a sustainable programme towards polyhouse is imperative and, though, there are a range of options for the farmers, success of the programme would depend on the profile and scale of adoption, technical support system, regions specific factors and market linkages to name a few.

3. Cost Dimensions of Polyhouse Farming and Marketing

Sample survey of beneficiaries through schedules, quantum of sample and sampling procedure was decided after a pilot visit to select districts (deciding factors were agro-climatic conditions, statewide representation and profile of adoption). Discussion with stakeholders was carried out (technical, financial and governance) to explore the qualitative and institutional dimensions.

Table 1. Number of polyhouses and total area under vegetable cultivation in Kerala – a perspective

District	Total Number of Beneficiaries of polyhouse	Area under cucumber in ha (a comparable crop)
Thiruvananthapuram	64	221
Kollam	25	24
Pathanamthitta	29	36
Kottayam	43	62
Alappuzha	32	101
Idukki	41	13
Ernakulam	89	100
Thrissur	72	90
Palakkad	56	118
Malappuram	45	314
Kozhikode	21	104
Wayanad	73	29
Kannur	22	250
Kasaragod	10	95
Total	622	1557

Source: State Horticulure Mission website for the number of beneficiaries and Agricultural Statistics, Govt of Kerala (2015-16) for area under cucumber cultivation.

It may be observed from Table 1 that there is no relationship between the area under cultivation of a particular crop and the number of polyhouse beneficiaries in a district. The point that could be emphasized that there are a number of other factors a farmer considers while setting up a polyhouse. In addition, cowpea beans is the only vegetable that is found cultivated in both polyhouse and open field on a regular commercial basis across the sample regions. The field survey was conducted across 6 districts of the state. The table 2 provides the number of beneficiaries across the select sample regions.

Table 2. Number of Beneficiaries across select districts

Districts	Number of beneficiaries
Thiruvananthapuram	64
Kottayam	43
Ernakulam	89
Palakkad	56
Wayanad	73
Kannur	22

Source: State Horticulure Mission website

Out of the total of 622 registered beneficiaries, a few of them cultivate only flowers in their polyhouses, such as Gharbhera. Leaving aside those not cultivating vegetables and those which are not currently active (as reported from the field through unofficial sources), the total

number of population comes to around five hundred. Thiruvananthapuram, Kottayam, Ernakulam, Palakkad, Wayanad and Kannur were purposively selected for coverage of beneficiaries in the field survey. The sample beneficiaries were selected from each district based on both random as well as snow ball approach (Table 3). Other considerations were the geographic spread and coverage of various agro climatic conditions in the state. The purpose was to get required information on polyhouse cultivation of various crops using a pre tested and structured schedule. A sample of around ten percent of the existing beneficiaries is taken for the study.

Cost of cultivation under protected farming condition includes all the cost incurred on an annual basis, and split into fixed and variable costs. The variable cost items are the materials, labour, interest on working capital. Fixed costs include rental value of land and interest on fixed capital. Apart from the cost of cultivation there are other cost components that growers face and they come under the marketing aspects basically packaging and transportation to far and near markets. Gross returns are the values of total quantity produced at the prices where they are sold.

The sample beneficiaries started polyhouse farming at various points in time during 2010-15, and the cultivation and production related data also pertain to these period. As reported by majority of beneficiaries a productive life of five years is assumed for the polyhouse, beyond

which it becomes liable for major repair incurring upto three fourth of the original investment. Cost of construction is as reported by beneficiaries. The establishment cost of polyhouse includes the value of land, cost of irrigation structure, electric installation and land preparation at the beginning. The establishment of a polyhouse requires more investment as Hi-tech unit of the size of 400 square metres is worked out to be in the following order as illustrated in table.

Table 3. The final sample details are as follows:

Districts	Number of Beneficiaries Covered
Thiruvananthapuram	8
Kottayam	10
Ernakulam	10
Palakkad	7
Wayanad	10
Kannur	8
Total	53

3.1. Profile of Adoption Across Kerala – SomeQualitative Observations

The coverage is wide across the sample beneficiaries. The sample covers beneficiaries having small (as low as 219 Sq Mtrs) as well as large (2000 Sq mtrs) area under polyhouse vegetable cultivation. However, many similarities in the general pattern of adoption are found.

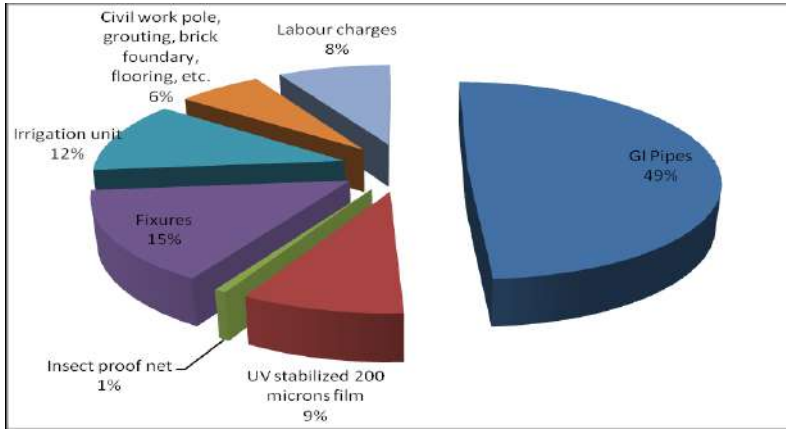
For instance, 65 percent of the sample beneficiaries cultivate salad cucumber and cowpea beans on a regular basis and amaranths on an interim basis. Of course, the proportion of cultivation of cucumber and cowpea within a polyhouse varies among the regions covered. It is observed that cultivation of cucumber is proportionately high in Palakkad, Kannur and Thiruvananthapuram but low in Kottayam. 60 percent of the sample beneficiaries availed loans proportionate to the amount spent on polyhouse and most of the loans are industrial purpose loans with interest rate higher than 10%.

Polyhouses in Kerala broadly are of two types – gable and saw tooth (the distinction is based on the roof type and ventilation with implications on inside temperature and thereby productivity). However, one third of the sample beneficiaries do not know what type their polyhouses were indicating a suboptimal awareness about the system. It was established that sow tooth type is more suited to the weather conditions of Kerala given the high humidity and also established that sow tooth type yields higher productivity. The adoption of polyhouses has a relatively poor spread in Northern Kerala. This is especially in Kannur and Kasaragod districts and extreme hot and humid climatic conditions are cited as the major reason for the low adoption rate.

Actual cost of construction of polyhouses incurred by beneficiaries differed significantly from the estimate of MIDH – to the tune of around Rs. 250-300 more per Sq Mtr (Rs. 935 is the MIDH

rate based on which 75% subsidy was dispersed). The survey covered a range of beneficiaries across a wider range of parameters. Nearly half of the beneficiaries in the sample have an area less than 500 square metres on an average and around 27 percent of the beneficiaries had area above 1000 square metres and the rest falling into the category of 500-1000 square metres. A majority of the beneficiaries started polyhouse in 2013 and later. The cost of construction of a polyhouse was basically drawn by SHM at the rate of Rs. 935 per square metre. This was based on the prevailing cost of construction materials of shadenets, GI pipes, and irrigation sets (three major components) (figure 1). Depreciation was estimated based on a straight line method. A 10 percent allowance or salvage value was taken from the asset's initial cost. The remaining amount was divided by the asset's expected economic life (assumed to be five years in this case) to estimate depreciation.

Figure 1. The relative share of major components in the construction of a naturally ventilated polyhouse



Source: State Horticulture Mission

3.2. Cost of cultivation and returns per cycle of 150 days

(Only salad cucumber and cowpea beans are selected as these are cultivated by majority of sample beneficiaries and other crops were observed to be insignificant filler crops. The most important factors in overall cost dimensions in Kerala are the cost of labour. The table 4 is illustrative of these two parameters across the major sample regions based on the reporting of polyhouse farmers.

Table 4. Average daily wage rate reported from the sample regions

Regions/District	Average wage rate (Rs/day)	
	Men	Women
Ernakulam	450	400
Wayanad	430	290
Kottayam	650	360
Kannur	600	320
Thiruvananthapuram	660	400
Palakkad	450	235

Source: based on the field survey conducted during November-December 2016.

Total Capital investment works out to Rs. 6,00,000 (actual based on beneficiaries) and subtracting the eligible subsidy of Rs. 2,80,000 (provided by MIDH, rate fixed at Rs. 935/sq mtrs), results in a net investment of Rs 3,20,000, A polyhouse is assumed to have a lifespan of five years. Annual depreciation cost to the tune of Rs. 64000 or Rs. 32000 per cycle as polyhouse is assumed to have a productive life of five years and repairs taking place after this period usually cost the beneficiary more than 60 percent of the original establishment cost of a polyhouse) (Table 5). MIDH also provides an input subsidy every year to polyhouse farmers which isRs. 75 per square metre.

Table 5. Cost and Returns from Polyhouse Cultivation (Rupees per 0.1 acre)

Items	In Rupees
Variable Costs	
Seeds	6000
Fertilizer and nutrient inputs	5500
Periodic maintenance costs	5000
Transportation to markets	7500
Imputed Labour Cost	40000
Total variable costs	64000
Interest on working capital@9%	5760
Total	69,760
Fixed Costs	
Rental value of land	2500
Interest on fixed capital@9%	225
Amortized establishment cost for 6 months (Biannual depreciation for the structure)	32000
Total Cost	104,485

Source: based on the field survey conducted during November-December 2016.

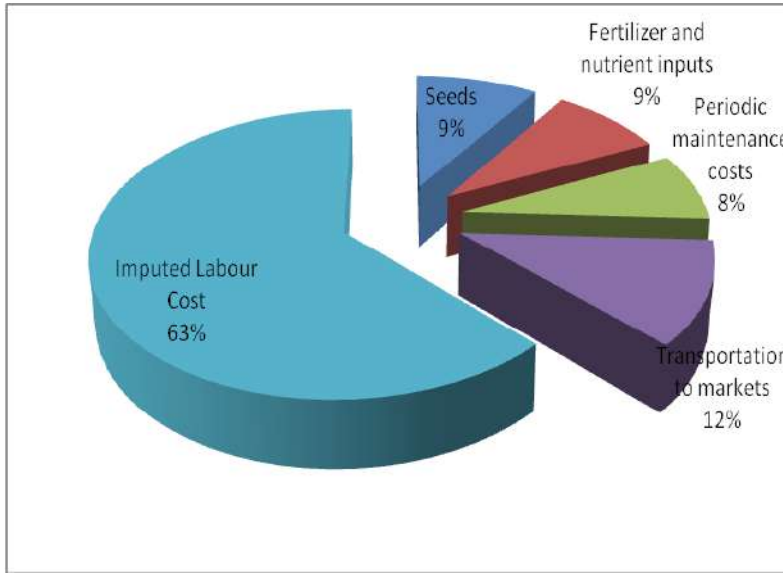
Table 6. Returns of Polyhouse Vegetable cultivation (from sale and input subsidies)

Items	Rate	In Rupees
Returns from Cucumber	2000 kgs @ Rs 35/kg	70000
Returns from Cowpea beans	650 kgs @ Rs 60/kg	39000
Total returns from sale		109000
Input subsidy per cycle @Rs 75/sq mtr for a year		15000
Total returns in a cycle		124000
B:C ratio		1.18

Source: based on the field survey conducted during November-December 2016.

Therefore, polyhouse cultivation has a cost benefit ratio of just 1.18 which may not be sustainable in comparison with open-field cultivation which does not have such a huge capital investment (Table 6). A break up view of the variable costs for polyhouse farming would reveal that a major proportion of these costs stem from labour related. The periodic maintenance also involves the use of manpower as the main component (mainly male labour is employed for this purpose) escalating the percentage of labour costs to total variable costs as high as 62 percentage. The figure-2 illustrates the proportion of various components in total variable costs.

Figure 2. Components of variable costs in percentages



Source: based on the field survey conducted during November-December 2016.

3.3. Issues in marketing

A majority of the beneficiaries reported issues in marketing, as a single biggest binding constraint in properly leveraging the yield and other inherent advantages. The highest and lowest prices in Kerala for the polyhouse output within a cycle of 150 days are realized by farmers in Palakkad and Kannur. In other words, these regions experience significant fluctuations in the price realized through a cycle. It is also reported that horticorp offers the lowest price for polyhouse output. Growers in all regions except Thiruvananthapuram sell the produce to retail shops within the vicinity of five kilometers and typically make

three trips in a week. The highest reported price offered for salad cucumber is Rs 60/kg from Wayanad and for cowpea is Rs 70/kg from Wayanad and Kottayam. Some districts exhibit good cohesion in marketing process and organizations collectively market produce from polyhouses across a particular district (Palakkad, Ernakulam for instance) in the vicinity of Collectorate on a particular day of the week creating substantial turnover (reported to be in the range of INR 45,000 - 50,000 in Palakkad every Monday) during just a couple of hours. As one of the most binding constraint reported by the stakeholders, the issue of marketing in the regional level requires greater attention. This is made more complex with the arrival of bulk quantity of vegetables from neighbouring states which are geographically closer to some of the regions selected for the study. Thus, only some sort of branding the vegetables from polyhouses as 'Safe to Eat' will benefit the growers in the long run.

4. Conclusions and Recommendations

Polyhouse farming was propagated as very ideal in the context of Kerala where availability of land and labour is difficult and polyhouse requires only a smaller piece of land and could be managed by family labour. The field survey conducted across six districts reveal that beneficiaries ended up incurring significantly higher establishment cost for a polyhouse than what was estimated by the government. Given the limited number of crops coupled with constraints in marketing and

lack of realization of any premium over other vegetables beneficiaries find it difficult to sustain polyhouse farming in comparison to open-field. Most of the polyhouse cultivation are highly concentrated around two crops: salad cucumber and cowpea beans. Thus, how far polyhouses alone can address the availability of 'safe to eat' vegetables requires to be examined in further details. More than two thirds of the sample beneficiaries covered cultivates these two types of vegetables making it address a very narrow basket at the same time, with a lot of caveats. There is a wider perception among the beneficiaries that polyhouse is not suited to Kerala as much as it suits neighbouring states such as Tamil Nadu and Karnataka. The adoption was more fuelled by the experiences of neighbouring states rather than any study report within the state. Compared to open-field output, returns from polyhouse are not perceived to be attractive in the market and polyhouse output does not have a niche advantage. Also, there are similar schemes for the adoption of open precision farming which takes away the attraction polyhouses has.

An added highlight was the enhanced subsidy in which the potential farmer needs to bear only one fourth (25%) of the total cost. However, in reality, the base rate and area upon which subsidy is calculated, the farmer ends up paying close to half or more than half of the total amount needed for the construction of polyhouse. In this context, a thorough relook is warranted on the subsidy scheme and actual cost

of construction. Although a majority of sample beneficiaries adopted polyhouse out of own interest, it has to be reckoned that all of them had a larger area of land available for cultivation and many of the supplementary provisions of fodder, biofertilizers and irrigation systems in place already. It may be a herculean task for an individual without these types of endowments to adopt and sustain vegetable farming on a commercially successful scale. In addition, frequent washing and cleaning of the polyhouse meant that more than twice in a year one needs to hire labourers for these purposes (which cannot be typically managed by family labour).

Some districts exhibit good cohesion in marketing process and organizations collectively market produce from polyhouses across a particular district (Palakkad, Ernakulam for instance) in the vicinity of Collectorate on a particular day of the week creating substantial turnover (reported to be in the range of Rs. 45,000 - 50,000 in Palakkad every Monday) during just a couple of hours. In general, the marketing cost is high as a component in the overall cost of vegetable farming. Only one third of the sample beneficiaries covered have some sort of organized marketing networks. Most of the beneficiaries give the produce to nearby local retail shops and thus save on transportation and other associated costs. It is considered to be one of the biggest drawback of the whole system in which 'safe to eat' vegetables do not fetch any premium or there are no institutional support present at the marketing

side. Facilitating in establishing a link with export markets or overseas buyers (as one sole beneficiary is reported to have done) would help earn a higher premium. The institutional support for marketing the polyhouse produce requires a more robust policy framework. Therefore, existing polyhouse farmers should be offered repport on a continuous basis and the new initiatives may be facilitated only after a careful examination of realistic costs involved, suitability to the general weather conditions and market situations.

Notes

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