FEASIBILITY AND UTILIZATION OF IMPROVED VEGETABLE PRODUCTION TECHNOLOGIES IN FAMILY FARMING BY AGRICULTURAL LABOURERS IN THE THRISSUR DISTRICT

By

ABDUL JABBAR, P. K.

THESIS

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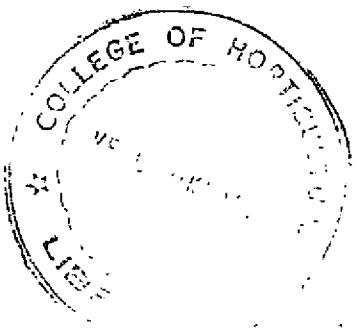
DECLARATION

I hereby declare that the thesis entitled **'Feasibility and Utilization of Improved Vegetable Production Technologies in Family Farming by Agricultural Labourers in the Thrissur District'** is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship, associateship or other similar title, of any other university or society.

Vellanikkara

ABDUL JABBAR, P.K.



DR.P.RAJENDRAN
Associate Professor
(Agricultural Extension)
Regional Agricultural Research Station
Pattambi

Pattambi

CERTIFICATE

Certified that the thesis entitled **'Feasibility and Utilization of Improved Vegetable Production Technologies in Family Farming by Agricultural Labourers in the Thrissur District'** is a record of research work done independently by **Mr.Abdul Jabbar, P.K.** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.

P.RAJENDRAN
Chairman
Advisory Committee

CERTIFICATE

We, the undersigned members of the Advisory Committee of **Mr.Abdul Jabbar, P.K..** a candidate for the degree of **Master of Science in Agriculture** with major in **Agricultural Extension**, agree that the thesis entitled **'Feasibility and Utilization of Improved Vegetable Production Technologies in Family Farming by Agricultural Labourers in the Thrissur District'** may be submitted by Mr.Abdul Jabbar, P.K. in partial fulfilment of the requirement for the degree.

Dr.P.Rajendran
Associate Professor
(Agricultural Extension)
Regional Agricultural Station, Pattambi
(Chairman)

Dr.A.I.Jose
Associate Dean
College of Horticulture
Vellanikkara
(Member)

Dr.C.Bhaskaran
Associate Professor
Dept. of Agricultural Extension
College of Horticulture
Vellanikkara
(Member)

Dr.K.Mukundan
Professor & Head
Dept. of Agricultural Economics
College of Horticulture
Vellanikkara
(Member)

EXTERNAL EXAMINER
Dr. M. Ananthavalli

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Abdul Jabbar, P.K.

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Introduction

INTRODUCTION

Agricultural labour constitutes one of the vital inputs in the agricultural production process. The association of labour with agriculture is as old as farming occupation itself. Agriculture continues to be the most important and single largest sector of Kerala's economy, accounting for about 93 per cent of the State's income in the primary sector (State Planning Board, 1991). In Kerala there are about 21.03 lakh agricultural labourers accounting 25.66 per cent of the total workers in the State (Government of India, 1991). The emerging scenario is indicative of an unprecedented increase in the number of agricultural labourers in the years to come. Every circumstance which has weakened the position of the small holder has increased the number of agricultural labourers.

It will be no exaggeration to say that efficient agriculture depends on the qualities of the man behind the plough, more than anything else. The importance of the agriculture labour and small farm household sector in Indian agriculture is obvious. This contributes not only the potential for growth but also provides he market for a sustained process of development. In a practical context the problem of small farmers and agricultural labourers is one of poverty and unemployment, the bulk of the poor and the unemployed are located in the rural areas. Out of the increasing labour force only a small fraction is able to enter the organized sector a substantial portion of the additional labour force to be provided with productive employment would be in the small farm and agricultural labour household sector (International Labour Organization, 1979).

Agricultural labourers contributed immensely to the development of agriculture but their share in the gains from development has been the lowest. There has been a steep decline in the proportion of self employed households in agriculture and an increasing casualisation of agricultural labourers. This is both on account of technological change in agriculture and decline in self employment (NCRL, 1991).

Every one acquainted with rural condition in India will agree that the atmosphere prevailing in rural areas is badly affecting the psychology of labourers. Low labour productivity in agriculture, under employment and surplus manpower, landless labour and low standard of living are some of the problems of agricultural labour in India. The exceedingly low level of asset holding and debt among them act as major a obstacles preventing them from benefiting from most programme purporting to benefit them.

It has been generally observed that market wages of agricultural labour are higher wherever land is more evenly distributed, since they have a better bargaining power in such situations on account of their land base (NCRL, 1991). Most of the agricultural labourers are gainfully employed throughout the year. Opportunities for employment in nonfarm sector of the economy are meagre for two basic reasons - (1) there is in general a lack of employment potential and (2) the skills required for the jobs available are beyond the capability of unskilled farm workers. As a direct consequence of low productivity under employment and lack of opportunities in nonfarm sector, standard of living of many agricultural families is low (Sharma, 1985).

The benefits of economic growth can trickle down to the poor mainly through the expansion of employment opportunities. For trickle down process to be

effective growth has to be higher. Under the prevailing social structure and policy frame work the tendency to economise on the use of labour has been pronounced. As such the trickle down effects of growth have been negligible for the rural poor (NCRL, 1991). There is evidence to show that labour use per hectare may increase on the smaller holdings either due to rise in cropping intensity or the adoption of a more labour intensive cropping pattern or through a greater use of labour per hectare under individual crops. Greater availability of family labour in conjuction with the income effect (arising out of low income) induces them to do their utmost in increasing output by maximising their labour input (ILO, 1979).

The production of vegetables in Kerala is to the tune of 1.5 lakh tonnes against a current requirement of 3 lakh tonnes indicating that half of the requirement is met by procurement from other States. In fact this target of 3 lakh tonnes can meet only a per capita requirement of 30 g per day which is deplorably below the recommended standards (State Planning Board, 1991). To achieve a reasonably high standard of consumption of vegetables, the current production of vegetables will have to be stepped up. Average size of holding in Kerala is 0.36 ha. Since there is no scope of bringing additional area in large scale all efforts are to be made to increase production in the marginal holdings especially in the case of agricultural labourers usually with meagre land of their own, who lease in rice lands during summer season for the purpose of vegetable cultivation in many areas of Kerala. It was felt necessary to initiate concerted efforts to evolve viable strategies for the sustainable development of marginal homesteads of agricultural labourers, where family farming exploiting the labour potentials of the whole family is prevalent. In this context the present investigation was undertaken with the following specific objectives:

1. To analyse the perception of feasibility of improved vegetable production technologies (IVPT) by agricultural labourers engaged in family farming.
2. To assess the extent of utilization of improved vegetable production technology by agricultural labourers in family farming.
3. To identify the relationship between selected personal, socio-cultural and techno-economic factors and the utilization of improved vegetable production technologies.
4. To assess the level of knowledge of agricultural labourers on improved vegetable production technologies.
5. To identify the constraints in and consequences of utilization of improved vegetable production technologies in family farming.

Scope of the study

Vegetable farming utilizing improved technologies will provide not only income from vegetables but also by way of imputed wages of family labour. Cultivation of vegetables in homesteads or in the leased-in lands by agricultural labourers is a predominant feature in Thrissur District of Kerala. No systematic investigation has so far been undertaken in Kerala to ascertain the feasibility and utilization of improved practices in vegetable farming by agricultural labourers in their own farms. This study therefore, would be a pioneering attempt in this direction. The study would help in evolving strategies to ensure gainful returns from homesteads of agricultural labourers. Factors affecting feasibility and utilization of vegetable production technologies will provide the much important feed back to the researchers in this area. The measurement procedures to be developed for quantification of

variables in the study would be useful contribution to the body of research in agricultural extension.

Limitations of the study

The study was undertaken as a part of the post-graduate research and it had the invariable inherent limitations of resources such as time and money. These limitations restricted the size of sample and the extent of study area also was confined to a single district. In spite of these, due attention was paid to conduct the study with atmost objectivity and in a scientific manner.

The analysis of feasibility was based on the perception of respondents and the study required many other informations as responses from agricultural labourers. Thus the element of subjectivity cannot be fully eliminated.

It was also noticed that the interplay of multiplicity of constraints between perceived feasibility of practices and their utilization made the comparison between these ineffective. However, in interpretation and presentation, maximum objectivity was maintained and it is expected that the results would have significant policy implications.

Presentation of the thesis

Besides this introductory chapter the second chapter viz., Theoretical orientation deals with the review of selected important and related studies in the field of present investigation. The third chapter présents the Methodology used in the study, location of the study area, sampling procedures followed, quantification of variables selected and statistical techniques employed in data analysis and

interpretation. The fourth chapter deals with the Results of the investigation and Discussion while the last summarises the study with implications and suggestions for future research.

Theoretical Orientation

THEORETICAL ORIENTATION

A review of the existing literature on a research topic helps the researcher in the delienation of relevant concepts and their relationship and also in providing a sound theoretical frame work for his study. The present study had the limitation of lack of directly related studies on feasibility and utilization of agricultural technologies by the agricultural labourers. However, besides studies on agricultural labourers; the available studies on other categories of farmers and related areas are also reviewed in this section and are presented under the following heads.

2.1 Concept of agricultural labourer

2.2 Concept of family farming

2.3 Perception of feasibility of agricultural technologies

2.4 Utilization/adoption of agricultural technologies

2.5 Constraints in the utilization/adoption of agricultural technologies

2.6 Consequences of utilization/adoption of agricultural technologies

2.7 Characteristics of farmers associated with feasibility perception and utilization of agricultural technologies

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2.9 Training needs of agricultural labourers in vegetable production technologies

2.10 Conceptual frame work for the study

2.11 Hypotheses for the study

2.1 Concept of agricultural labourer

Agricultural workers constitute the most neglected class in Indian rural structure. Unlike industrial labour, agricultural labour is difficult to define. Difficulties in defining agricultural labour are compounded by the fact that many small and marginal farmers also work partly on the farms of others to supplement their income. Despite these difficulties, various attempts have been made to define agricultural labour by different experts and committees appointed by the Government from time to time.

The first Agricultural Labour Enquiry Committee of 1950-51 regarded those people as agricultural labourers who kept themselves engaged for either half or more than half of their annual working days in agricultural operations on payment of wages. The second Agricultural Labour Enquiry Committee (ALEC) of 1956-67, included wage paid employment in other agricultural occupations like dairy, horticulture, bee keeping, poultry, etc. besides cultivation of land. According to this, if 50 per cent or more of income in a household is derived as wages for work rendered in agriculture, only then it could be classified as agricultural labour house hold.

According to Census India, 1981, a person who worked in another persons land for wages in cash, kind or share of crop was regarded as an agricultural labour. Such a person had no risk in cultivation but merely worked in another persons land for wages. An agricultural labour had no right of lease or contract on land on which he worked.

In short, all those persons who derive a major part of their income as payment for work performed in the farms of others, can be designated as agricultural workers. For a major part of the year, they should work on the land of others on wages. For this study, an agricultural labour was one having meagre land of his own and deriving more than 50 per cent of his income from agricultural labour.

2.2 Concept of family farming

One of the basic characteristics of the family farm is that labour as the single most important factor of production is provided mostly by the members of the farm family. According to Kada (1985) farm organisation and management in the context of family farming have to be arranged in such a way that the available family labour is kept in proper balance with other production factors such as land and operating capital.

Baranger (1991) in a study focussing the development potential of family farms opined that two different types of labour force exchange play an important role among farmers in Argentina. These mutual help relationships provide for real or potential deficits in the supply of domestic labour. They serve to avoid paying salaries to wage labourers and to maximise self-exploitation of the household and its collaborating neighbours. The participants in work exchanges are often determined by factors such as kinship or similar social standing. The mutual help system thus link small family farm and thereby play an important role in ensuring farm viability.

Farmily farming may be thought of an icon, a representation of collective sentiments, encompassing significant national values and identity. Gasson

et al. (1988) have identified three senses in which farms can be regarded as essential family business.

a) The principles are related by kinship or marriage.

b) Business ownership is usually combined with managerial control.

c) Control is passed from one generation to another within the same family.

It has been shown that there are a variety of off-farm jobs taken by farm family members. Fuller (1990) has coined the term "Pluriactivity" which describes these farm households which engage in activities in addition to farming such as employment in other farms, para-agricultural activities, other non-agricultural activities in the farm and off-farm activities. Pluriactivity is a perceived means of accomodating change, adapting to agricultural realities (eg. minimising risk), maximising opportunities, raising a family and staying on the land.

Recent changes in rural economic structure and in family values have brought about a dramatic transformation of the pattern of farm Pluriactivity. Family farming can be considered a production system often oriented towards self-consumption. The pattern can be regarded more as an expansion of the domestic sphere of rural workers' households rather than as small peasant holdings.

The combination of products on a given farm and the methods or practices that are used in the production of these products is known as system of farming. Family farming, one among such systems, has the following characteristics:

1. All agricultural operations are done by family members.
2. Capital and management are also of the family members.

3. The income is distributed by the head of the family according to the need of the members.
4. All the members of the family work together.

2.3 Perception of feasibility of agricultural technology

2.3.1 Concept of perception

According to Blalock (1963) perception has the following characteristics.

1. It is an individual matter. Thus there may be as many perception as there are individuals.
2. It must be dealt with in terms of what an individual actually experiences.
3. It involves not only perceiving the stimuli but also interpreting and describing these stimuli in terms that are meaningful to the individual.
4. Various internal and external factors may influence both the interpretations of the stimulus and response it is likely to evoke.
5. It is a dynamic phenomenon that may be continually changing with the individual.

Theodorson and Theodorson (1970) defined perception as the selection, organisation and interpretation by an individual of specific stimuli in a situation according to prior learning, activities, interest, experiences, etc.

Man does not perceive all that is presented to him. Bhatia (1978) opined that perception is selective and is influenced by, (a) attention at a time, out of a large number of stimuli that are pressing upon our sense organs, we perceive only a few of them those to which we attend, (b) set - we always perceive what we expect to

perceive, (c) interests and values - when a specific stimulus is of special importance to the individual, he perceives it more easily and readily, (d) social norms - social and cultural factors influence perception and (e) social perception; where things, situations and people are perceived according to interest, attitudes and values of the groups to which we belong.

Rajan (1979) stated that social structure and farm family play an important role in the process of formation of attitudes and perceptions and their effects on the adoption of new technology.

Brady (1981) reported significant influences of social benefit on perception, in a study on developing and transfering technology to small scale farmers.

Harwood (1981) in a study on agromic and economic consideration of technology acceptance in transfering for small scale farming revealed that low requirements of resources is significant in perception.

Thus, perception is an internal condition, representing external things and this psychological process helps to delineate and make out various sensory stimulations bombarding the individual. This is made possible with the help of previous knowledge and experiences inscribed in the mind of the individual regarding the stimulations.

2.3.2 Concept of feasibility

Webster's Nineth New Collegiate Dictionary (1988) gave meaning to the word 'feasible' as:

(a) capable of being done or carried out

(b) capable of being used or dealt with successfully

Lakshminarayana (1984) reported that the ultimate adoption of technology depends entirely upon the characteristics of individuals/groups for whom the technology has been meant for, in addition to their perception about the attributes of the transferred technology.

Singh (1984) opined that the success of transfer of technology depend upon understanding the nature and characteristics of the technology and their specific requirements, the characteristics of the farming community and effective communication strategy.

Planck (1987) observed that each technological innovation in farming meets pre-formed cultural pattern and social structure. Adoption of techniques from a strange culture can super impose, displace or destroy the existing culture.

Mena (1988) opined that a technology which is appropriate for certain levels of development in a particular society may be found inappropriate for other societies at similar levels of development. The development of technology requires an appreciation and consideration of local culture and conditions.

Ensminger (1989) stated that for farmers to move from traditional towards a modernised agriculture, technology must prove to be trustworthy, the availability of credit and inputs must be assured and markets must be reliable.

Kapur (1989) observed that each level of technology needs its own milieu, its own system of organisation to take roots. The technologies that we

innovate must not only be appropriate to our needs, but also to the times and there must also be a new social organisation and environment to sustain them.

Rajendran (1992) found out simplicity, initial cost, physical compatibility, suitability, availability of raw materials, efficiency and availability of technology as the crucial determinants of feasibility of agricultural technologies in general.

These observations drive home the point that feasibility of agricultural technologies is an important determinant of its utilization by farmers in general. Feasibility of the agricultural technology is of paramount importance so far as agricultural labourers are considered in view of their general vulnerability and the sophistication of the technology evolved in agricultural sector.

2.3.3 Perception of feasibility of technologies

Specific studies on the perception of feasibility by agricultural labourers were not available and hence studies conducted among other farmers are summarised below:

Chakravarthy (1981) reported that small farmers perceived the indegenous farm practices to be more simple, profitable, cheap, physically compatible and flexible than the medium and big farmers.

Jaiswal and Das (1981) reported that several attributes have to be considered carefully while developing a particular technology and transferring the same to the farming community, particularly to the small and marginal farmers. They were as follows:

1. Attributes of the adopters (technical skill, attitude towards change and risk, level of aspiration and level of income)
2. Aspects of technology (profitability, diversibility, complexity, communicability and technical soundness of the technology)]
3. Characteristics of economy (infrastructure demand for products, Government policy, etc.)
4. Features of environment at the farm level (socio-cultural factors, farm resource constraints)
5. Risk and uncertainity

Leagans (1985) observed that the optimum adoption of agricultural production innovation was achieved only when a farmer was persuaded to accept a technological innovation, which, for him is technically sound, economically feasible, physically possible and politically and socially compatible.

Ensminger (1986) expressed the view that if the small farmer is to significantly improve his yields, he must be aided with agricultural technology within his resources and competence.

Sundaram (1986) revealed that majority of farmers had average level of perception about the effectiveness of soil conservation practices and only 11 per cent of them had high level of perception.

Sudha (1987) opined that age had no relationship with the perception of participants about the Lab-to-Land programme.

Bertus *et al.* (1988) found that technologies that offer the greatest promise for contributing to the food security of resource poor farmers and herders share common characteristics as:

1. Technical and environmental soundness: Which mean technologies are able to stabilise, if not increase, production while ensuring conservation of natural resources.
2. Social desirability: Which means technologies must address to farmer - identified problems and constraints.
3. Economic affordability: Which means that resource-poor farmers must be able to obtain and maintain the technologies.
4. Sustainability: Which means that technologies are environmentally, socially and economically feasible to maintain in the long term.

Prasad (1989) stated that the appropriateness of a technology is basically a social issue. It raises questions related to who gains and who losses. It also raises questions related to the nature and extent of gains and losses. There can be several criteria for an appropriate technology:

1. It should have income yielding capability; ie., giving remunerative employment; level of productivity higher than the wage rate or earning level, lower employment displacement, etc.
2. It can be beneficial and will be acceptable only if its products have an assured market.
3. It should reduce fatigue and drudgery.

4. It should be socially acceptable; ie. it should reach people in farms which they can easily understand. It should not demand quick and drastic changes in family and group relations, social structure, beliefs, customs and economic interest, etc.
5. It should not have adverse effect on the ecosystem and
6. Repair and maintenance aspects of it should be manageable.

Latha (1990) established high positive and significant relationship between education and perception of users of biogas technology.

Babu (1995) observed that majority (72.22%) of the homestead farmers had medium level of perception about the appropriateness of farming systems and cropping pattern adopted in the homesteads. Evaluative perception was positively and significantly correlated with the level of knowledge and extent of adoption.

2.4 Utilization/adoption of agricultural technologies

The utilization of a technology refers to the acceptance and use of the technology by those for whom it is intended. In the present context; it refers to the adoption of technology.

Chandrakandan and Subramanian (1975) concluded that farmers were more likely to adopt the farm practices when they perceive the practices to be more compatible, more efficient and feasible, more communicable, simple to adopt, less costly, highly divisible and more profitable.

Padmanabhan (1981) found out that the adoption rate of scientific agricultural practices of agricultural labourers was very low.

Goudi and Gowder (1983) indicated that recommendation involving high cost such as use of fertilizers and plant protection chemicals have been only partially adopted by majority of farmers.

Leagans (1985) stated that adoption behaviour tends to be specific to particular innovation, individual and environment.

Thamilmani (1985) reported that perception of adopters about the attributes of blue green algae had positive relationship with their adoption.

Rahiman *et al.* (1986) reported that seed rates used by vegetable growers were quite high compared to the Package of Practices Recommendations. They also identified that in contrast to the Package of Practices of specific chemicals or protecting vegetable crops from pests and diseases; they applied chemicals of their own choice.

Aziz (1988) indicated that majority of the farmers belonged to medium group in the extent of adoption of drought management practices in rice and coconut.

Prasad (1983) revealed that 92 per cent of the farmers did not adopt the seed treatment of paddy.

Bonny (1991) stated that majority of commercial vegetable growers were medium in level of knowledge, training need and extent of adoption.

Reddy (1991) found that majority of the registered cotton seed growers belonged to low adoption category while only 23 per cent belonged to the high category. Significant association was reported between adoption and their education, extension participation and innovation proveness where as age, farm size, family

size, social participation, economic status, mass media participation and achievement motivation had no association with the adoption level.

Balaji (1992) while studying the fertilizer use pattern in Pondicherry had observed that none of the sample farmers applied fertilizers at the recommended rate. In general, the sample farmers applied fertilizers higher than the recommended level for all crops except gingelly and ragi.

Rajendran (1992) while analysing the feasibility and utilization of selected agricultural enterprises found out that more than 50 per cent of the respondents were distributed in the medium category with respect to the level of utilization of the selected enterprises.

Adhiguru and Perumal (1994) revealed that the percentage of adoption with respect to variety and seed rate followed by fertilizer application as well as seed treatment of IPRD beneficiaries was very low. Those technologies which have visual impact will motivate the farmers for quicker and full adoption, while in the case of technologies with intangible impact, even low cost will not motivate the farmers to go for adoption.

Nagabhushanam and Guruprasad (1994) found out that slightly more than half of the coconut growers (51.67%) belonged to low adopted group, whereas 35 per cent belonged to the medium adopters and only 13.33 per cent belonged to the high adopters group.

Rathakrishnan *et al.* (1994) while studying the knowledge and rate of adoption of groundnut growers revealed that seed rate and spacing could not be followed since they used to sow the seeds behind the country plough.

Susamma (1994) revealed that cent per cent of the respondents engaged in sericulture adopted the recommended mulberry variety and majority of farmers had adopted recommended spacing, cultural operations and none had adopted any plant protection measures.

Theodore and Mansingh (1994) concluded that age, farm experience, mass media exposure and risk orientation had a positive and significant relationship. While knowledge and income had a negative, significant relationship with the extent of adoption.

2.5 Constraints in the utilization of agricultural technologies

Pandya and Trivedi (1988) defined constraints as those items of difficulties or problems faced by individual in adoption of a technology. According to Zinyama (1988) a constraint is any problem or limitation.

Norman (1982) identified the problem in vegetable cultivation as the high attack of pests and diseases and high input cost. Farmers also stated that they experienced serious transportation problems in marketing their produce.

Waghmare and Pandit (1982) reported that lack of knowledge resulting from lack of technical guidance about the improved practices in wheat technology was the major constraint in its adoption.

From his investigation, Nair (1969) observed that lack of knowledge, non availability of inputs, high cost of fertilizer, insufficient labour supply and erratic rainfall were the important reasons for non adoption and partial adoption of the practices of paddy cultivation.

Sen (1984) pointed out that one of the major reasons of low or non-adoption of a large number of technologies was their lack of relevance under the conditions of various categories of farmers either in terms of their profitability or compatibility with their farming system as a whole.

Natarajan and Channegowda (1985) attributed the less use of institutionlised sources such as group meetings, demonstrations, Farmers Training Institute, etc. by agricultural labourers to their inability to spare working hours to seek new knowledge, non-accessibility of these resources, in addition to lack of resources with them to match the new knowledge.

Prasad *et al.* (1987) classified the factors influencing the development of agricultural sector in India in to common basic constraints, technological constraints, organisational and administration constraints, extension constraints and social constraints.

Vasanthakumar and Singh (1987) identified the constraints to agricultural development by the small and marginal farmers and classified them in to five categories as general constraints, technological constraints, input-oriented constraints, credit oriented constraints and infrastructural. They concluded that there were more of input oriented constraints followed by general, credit oriented, infrastructural and technological constraints in that order.

Menon and Bhaskaran (1989) found out lack of sufficients land and fragmented land holdings as the major constraints of agricultural technology in Kerala.

Bonny (1991) revealed that high cost of plant protection chemicals, in adequate markets, storage and post harvest facilities as the important constraints experienced by the commercial vegetable growers.

Reddy (1991) while studying the extent of adoption of registered cotton seed growers found the important constraints as lack of knowledge to identify off type of plants, supply of insufficient quantity of seeds and lack of technical guidance.

Rajendran (1992), while analysing the feasibility and utilisation of selected agricultural enterprises among scheduled caste farmers found out that lack of technical knowledge, lack of necessary supporting services and unavailability of raw materials as the major constraints in the utilization of agricultural technologies in general.

Geethakutty (1993) while analysing the fertilizer use behaviour of rice farmers in Kerala revealed lack of knowledge about fertilizer use, lack of assured irrigation facilities, high cost of fertilizers, high rate of labour wages, increased incidence of pests and diseases, non-availability of organic manures and improper drainage facilities as the major constraints.

Bhaskaran and Sushama (1994) cited lack of infrastructural facilities, absence of technology evaluations and upgradation efforts, inadequate training for farmers, extension personnels and researchers, lack of functional linkages among the research, extension, input and farmer sub-systems as some constraints in technology transfer in Kerala agriculture.

Rathakrishnan *et al.* (1994) identified inadequate supply of inputs, inadequate knowledge and lack of skill as the major constraints of groudnut growers.

2.6 Consequence of utilization/adoption of agricultural techniques

Rogers and Shoemaker (1971) defined consequence as the changes that occur within a social system as a result of the adoption and rejection of oan innovation.

Pandey and Khanna (1980) observed that Small Farmers' Development Agency (SFDA) had made a positive and significant impact of income and consumption of the beneficiaries and also on the acquisition of assets by the weaker section which has improved their risk bearing ability and credit carrying ability.

The nature of consequences in the utilization of agricultural technologies as reported by some of the researchers is furnished as under:

Sl.No.	Nature of consequence	Author and year
1	Enhancement of family income	Gari (1983)
2	Decline of income	Lakshmidevi (1985)
3	Increase in cropping intensity	Nagadevara and Swamy (1985)
4	Crossing poverty line	Sarawgi *et al.* (1986)
5	Progress in living conditions	Devan (1988)
6	Increase in adoption level	Nandakumar (1988)
7	Increase in social status	Dhillon and Sandhu (1990)
8	Reduction of drudgery of work	Sharma (1990)
9	Generation of additional employment	Esakky (1991)

Rajendran (1992) found out untimely and ineffective utilization of inputs and inclusion in the defaulters list of credit agencies as the major consequence of utilization of agricultural technologies by scheduled caste farmers in general.

Nataraju and Shivamurthy (1994) reported increased opportunity to know more abouts dairying, developed confidence on the worth of the practice, better relations with extension personnel, increased and sustained income over previous years as the major direct-functional-social consequences of adopting dairy innovations. Increased number of outside contacts and increased organisational participation were cited as the major indirect-functional-social consequences. Proper utilization of leisure time of the family, increased yield of crops and increase in family milk consumption were reported as the major indirect-functional-economic consequences.

2.7 Characteristics of farmers associated with feasibility perception and Utilization of agricultural technologies

Though there are many studies available on the relationship of characteristics of farmers with their adoption behaviour, specific studies pertaining to the agricultural labourers are scanty. There were dearth of studies in the area of feasibility perception of agricultural technologies. Hence the studies on other categories of farmers are also reviewed.

2.7.1 Education

Education and perception

Bhilengaonkar and Dakh (1978) in their study on mobile Farm Advisory

Service observed that farmers with high utility perception were having education above middle school level indicating a positive relation.

Pillai (1978) observed that there was no significant relationship between educational status of farmer and his perception about soil conservation measures.

Sundaram (1986) found positive relationship between perception of effectiveness of soil conservation practices and education.

Balan (1987) observed positive relationship between perception of effectiveness of soil test recommendations and education.

Latha (1990) established high positive and significant relationship between education and perception of users of biogas technology.

A positive relationship between education and feasibility perception was anticipated for the study.

Education and Utilization

The nature of relationship reported in earlier studies between education and adoption is presented below.

Author with year	Relationship established
Tantray (1987)	No association
Sulaiman (1989)	Significant positive association
Satheesh (1990)	Significant positive association
Krishnamoorthy (1991)	Non-significant association
Rajendran (1992)	Positively significant

For the present study, a positive relationship between education and adoption was anticipated.

2.6.2 Farm size

Adoption and Farm size

Sen (1981) observed that the adoption rates vary from one size group of farmers to another.

Pillai (1983) also reported that farm size had influence over adoption of improved practices.

Krishnamurthy (1984) reported that farm size and application of chemical fertilizers to dry land crop were positively correlated.

Swaminathan (1986), Reddy (1987) and Satheesh (1990) found out positively significant relationship between farm size and adoption.

A positive relationship between farm size and utilization was hypothesized for the study.

Perception and farm size

Muthukrishnan (1982) reported that farmers with longer size of holding had more number of cattle and also perceived the gas plants to be profitable compared to others.

Seema (1986) revealed that size of holding was an important variable in explaining the variation in role perception.

Balan (1987) reported positive relationship between size of holding and perception about soil test recommendations.

Latha (1990) observed negative relationship between farm size and perception about efficiency of biogas technology.

A positive relationship between farm size and feasibility perception was anticipated for the study.

2.7.3 Area under vegetables

Area under crop and adoption

Sivaramakrishnan (1981) and Anantharaman *et al.* (1985) reported positive relationship and substantial indirect effect of area under crop on adoption.

Sulaiman (1989) observed that the area under rice was significantly correlated with adoption of fertilizer management practices by the rice farmers.

Satheesh (1990) reported positive significant relationship between area under mulberry cultivation and extent of adoption of recommended chawki rearing practices.

Gopala (1991) also reported positive significant relationship between area under mulberry cultivation and extent of adoption of sericultural practices.

Nanchinal *et al.* (1991) while analysing the adoption pattern of recommended practices of potato crop, found out significant positive relation between area under potato and extent of adoption.

Chiprikar and Khuspe (1992) identified a significant, positive relation between area under grapes and the adoption behaviour of grape growers.

Based on the above studies, a positive relation was hypothesised between adoption and area under vegetables.

Area under crop and feasibility perception

Damodaran (1994) established significant positive relationship between area under banana cultivation and perception about risk in banana cultivation.

No further studies could be traced on the relationship between area under crop and the related technological feasibility. However, a positive relation was anticipated between the variable and the feasibility perception.

2.7.4 Experience in vegetable cultivation

Experience and adoption

Padmanabhan (1981) observed a negative relationship between experience and efficiency of agricultural labourers.

Balasubramanian and Kaul (1982) observed that significant relation existed between farming experience and adoption of improved practices.

Jayakrishnan (1984) reported a positive and significant association between farming experience and extent of adoption of low cost technology in paddy.

Bonny (1991) found out that experience in vegetable cultivation had significant positive association with extent of adoption of improved vegetable cultivation practices.

Susamma (1994) found a positive and significant relation between experience in sericulture and adoption of recommended sericulture practices.

Based on these, a positive relationship between experience in vegetables cultivation and adoption was postulated.

Experience and perception

Singh and Srivastava (1970) found out that experience of extension personnel was not associated with their perception about the nature of their job as an educational one.

Sobhana (1982) reported a non-significant association of experience with role perception and also with role performance.

Srinath (1986) pointed out that experience had no association with the job perception of horticultural officers and Assistant Directors of horticulture.

Sunilkumar (1993) established no significant relationship between experience and role perception.

Arulraj and Ulagalandan (1995) revealed that experience in sugar cultivation was positively related to perception of feasibility of early planting of the crop.

A positive relationship between experience and feasibility perception was hypothesised for the study.

2.7.5 Family Farming Time

Family farming time and adoption

Susamma (1994) found out leisure time availability as an important variable in predicting the extent of adoption of sericulture technology.

Andrews (1994) established significant relationship between leisure time availability and extent of participation in sericulture operations.

Other studies on leisure time availability and adoption of agricultural technology by farmers could not be traced. The free time at the disposal of the family members for engaging in family farming is an important and essential consideration in adoption of farm technology.

In this study leisure time availability was expected to have positive relationship with the extent of adoption.

Family farming time and perception

Dikle *et al.* (1992) observed a significant but negative relationship between time spent for reading and utility perception of agricultural information.

No other studies could be traced out between leisure time available and act of perception of farmers. However, it was assumed to have positive influence on feasibility perception.

2.7.6 Annual Income

Annual income and adoption

A non significant relation of annual income with extent of adoption of improved practices was reported by Balasubramanian and Kaul (1982).

Naik (1988) also confirmed a similar relation between annual income and extent of adoption of improved practices in paddy.

Baadgaonkar (1987) and Aziz (1988) observed a significant positive relation between annual income and extent of adoption of improved agricultural practices.

Anithakumari (1989) established no significant relationship of annual income with adoption behaviour.

Theodore and Mansingh (1994) found out a negative and significants relation between income and extent of adoption of farmers.

Babu (1995) observed significant positive correlation between annual income and adoption of scientific practices.

A positive relationship between annual income and adoption was expected in this study.

Annual income and perception

Bhilegaonker and Dakh (1978) found that farmers with medium income level had high perception of the utility of mobile farm advisory service indicating a positive relationship.

Muthukrishnan (1982) reported that income and perception of attributes of biogas plants were positively related.

Seema (1986) discovered that income from agriculture and other sources had no significant relation with role perception or role performance of farm woman.

Balan (1987) obtained positive relationship between annual income and perception about effectiveness of soil test recommendation among farmers.

The findings of Latha (1990) revealed positive and significant relation between annual income of users and their perception of biogas technology.

For this study also a positive association between annual income and perception was postulated.

2.7.7 Family educational status

Sundaram (1986) established that educational status had the maximum direct effect on the perception of farmers about the effectiveness of soil conservation practices.

Aggarwal and Arora (1989) revealed that the highest educational level of a family member of adopter family was significantly associated with the adoption of biogas plants.

Latha (1990) found out that family educational status had positive and significant relationship with the perception of users about the efficiency of biogas technology.

Fathimabi (1993) revealed that family educational status had no significant relationship with utility perception of agricultural labourers about welfare programmes.

Based on these studies, it was expected that there would be positive relationship between family educational status and the dependent variables.

2.7.8 Attitude towards scientific agricultural practices

Attitude and adoption

Attitude is the degree of positive or negative affect associated with a psychological object (Thurstone, 1946). The attitude of farmers about an innovation is important in the adoption of that innovation.

Reddy (1987) reported that attitude of farmers towards Watershed Development Programme and its adoption were interrelated positively and significantly.

Chandra and Singh (1992) found positive correlation between attitude and adoption in the case of tribal agriculture.

Chiprikar and Khuspe (1992) found that attitude towards grape production technology was strongly and significantly related to its adoption.

Significant positive relationship between farmers' attitude and adoption of improved sugarcane production technology was reported by Singh *et al.* (1992).

Similar result was reported by Sulaiman and Prasad (1993) among paddy farmers regarding fertilizer adoption.

Devi (1994) stated that more than half of male agricultural labourers had high attitude towards scientific practices, whereas more than half of the female agricultural labourers had only low attitude towards scientific agricultural practices.

Susamma (1994) observed a positive and significant association between attitude of farmers towards sericulture and adoption of recommended sericulture practices.

A positive relation between attitude and adoption was anticipated in this study also.

Attitude and Perception

Sobhana (1982) revealed that attitude towards farming had positive and significant relationship with role perception and role performance.

Seema (1986) observed that role perception of farm women was not significantly related with attitude towards farming.

Latha (1990) established positive relationship between attitude and perception of farmers about the utility of biogas technology.

Based on the theoretical perspective and logical reasoning, it is postulated that attitude towards scientific agricultural practices would be positively related with the feasibility perception of agricultural labourers.

Alex (1994) found out that attitude was positively and significantly related to the role perception of agricultural labourers.

2.7.9 Innovativeness

Innovativeness and adoption

The review of studies on innovativeness in relation to adoption is summarised below.

Author with year	Relationship established
Krishnamoorthy (1988)	Positively significant
Anithakumari (1989)	Positively significant
Singh (1989)	No relationship
Krishnamoorthy (1991)	Positively significant
Reddy (1991)	Positively significant
Rajednran (1992)	Non-significant
Geethakutty (1993)	Non-significant

A positive relationship between innovativeness of agricultural labourers and their adoption behaviour was postulated for this study.

Innovativeness and perception

Sundaram (1986) observed positive and significant correlation between innovation proneness and perception of farmers about the effectiveness of soil conservation practices.

Balan (1987) also reported positive and significant relation between perception about soil testing and innovativeness.

Ramagowda and Siddaramaiah (1987) found that perception about innovation attributes namely profitability, trialability and observability were positively and significantly correlated with innovativeness.

Latha (1990) revealed significant relationship between innovation proneness and perception about efficiency of biogas technology.

Fathimabi (1993) established position and significant relationship of innovativeness with utility perception of agricultural labourers.

A positive relationship between innovativeness and feasibility perception was postulated for this study.

2.7.10 Self reliance

Studies pertaining to the relationship between self reliance and dependent variables were scanty and hence other relevant studies were reviewed.

Prasad (1983) had reported a high and significant relationship between self reliance and achievement motivation in the case of rice farmers.

Significant relationship of self reliance of farmers with their management orientation was reported by Sreekumar (1985).

Porchezhian (1992) pointed out significant correlation between self reliance and entrepreneurial behaviour of farmers.

Damodaran (1994) found out significant relationship between self reliance and perception about risk in banana cultivation.

Based on the above a positive relationship was anticipated between self reliance and the dependent variables.

2.7.11 Extension guidance

Extension guidance and adoption

The review of studies on extension guidance in relation to adoption of improved agricultural practices is summarised below:

Author and year	Nature of relationship
Prakashkumar (1980)	Positively significant
Rameshbabu (1987)	Positively significant
Reddy (1987)	Positively significant
Nandakumar (1988)	Non-significant
Ajayakumar (1989)	Positively significant
Rajendran (1992)	Positively significant

Based on the above it is anticipated that extension guidance would be positively related to the extent of adoption.

Extension guidance and perception

Desai (1981) found out that extension guidance was positively related to economic performance of cotton farmers of Karnataka.

No studies establishing the relationship between extension guidance and perception could be reviewed. The degree of guidance actually received by agricultural labourers directly from various extension personnel would be a determining factor in the perception of feasibility. Since extension guidance is obviously having a

bearing on familiarising the adopters on the pros and cons of innovations, a positive relationship between these two variables was anticipated in the present study.

2.7.12 Social participation

The nature of relationship with extent of adoption as reported by researchers is summarised below:

Author and year	Nature of relationship
Swaminathan (1986)	Non-significant
Igodan *et al.* (1988)	Positively significant
Aswathanarayana (1989)	Positively significant
Gopala (1991)	Non-significant
Krishnamoorthy (1991)	Positively significant
Nagabhushanam and Guruprasad (1994)	Significant relationship

For the present study, however, a positive relationship is postulated to exist between the variable social participation and extent of adoption.

Social participation and perception

Bhilengaonkar and Dakh (1978) found that farmers with high utility perception of mobile farm advisory service had high social participation.

Pillai (1978) noticed no significant relationship between perception and social participation of the farmers.

Muthukrishnan (1982) observed no relationship between perception and social participation of users of biogas technology.

Sundaram (1986) reported that social participation had positive and significant relationship with the perception of effectiveness of soil conservations practices among farmers.

Latha (1990) found significant correlation between social participation of users of biogas technology and perception about its efficiency.

Fathimabi (1993) established positive and significant relationship between awareness of agricultural labourers about welfare programmes and their social participation.

A positive relation was postulated between the variable social participation and feasibility perception.

2.7.13 Economic motivation

Economic motivation and adoption

Various studies establishing the relationship between economic motivation and adoption have been summarised below:

Author and year	Nature of relationship
Prakashkumar (1986)	Positively significant
Balan (1987)	Positively significant
Krishnamoorthy (1988)	Positively significant
Vijayan (1989)	Positively significant
Satheesh (1990)	Non-significant
Gopala (1991)	Non-significant
Rajendran (1992)	Positively significant
Susamma (1994)	Positively significant

For the above theoretical perspective, a positive relation between economic motivation and adoption was postulated for the present study.

Economic motivation and perception

Sundaram (1986) revealed that economic motivation was having positive correlation with the perception of farmers about the effectiveness of soil conservation practices.

Fathimabi (1993) found out a positive and significant relationship between economic motivation and the utility perception of agricultural labourers about related welfare programmes.

Babu (1995) observed positive and significant correlation between economic motivation and evaluative perception of farmers.

No further studies could be traced for regarding the relationship of this variable. However, a positive relationship was anticipated.

2.7.14 Risk preference

Risk preference and adoption

Sakthivel (1979) reported that the perceived risk was not related with extent of adoption of farm practices but it was negatively related with the extent of adoption of the practices like seed treatments and plant protection measures.

Vijayan (1989) established significant relationship between risk preference and adoption of improved practices of banana growers.

Rejendran (1992) found risk preference having significant influence in explaining the variation in the utilization of the enterprises by the Scheduled Caste farmers.

Positive and significant relationship between risk orientation and adoption of recommended sericulture practices was established by Susamma (1994).

Sundarambal and Annamalai (1995) established significant positive relationship between risk preference and perception.

The above studies lead to the assumption that risk preference may have a significant bearing on adoption behaviour and hence a positive relationship between them was postulated.

Risk preference and perception

Cancian (1979) provided a theoretical frame work for studying the role of risk and uncertainity in the farmers decision making process. The pattern he traced suggested that poorer farmer would take a greater role in technological change than they had often been accorded and that past hestiancy on the part of farmers who were well off in local terms may be due to more rank protection than the intransigence.

Sundaram (1986) found risk orientation as an important variable having positive correlation with the perception of farmers about the effectiveness of soil conservation practices.

Pandey (1990) observed that when farmers were risk averse, they were likely to put a premium on production method that reduces the perceived risk.

In this study, the variable risk preference was postulated to have positive bearing on the feasibility perception.

2.7.15 Level of aspiration

The important findings as reported by researchers on the relationship of level of aspiration and adoption are presented below.

Author and year	Nature of relationship
Sushama *et al.*, 1981	Positively significant
Thiagarajan, 1981	Non-significant
Ramagowda, 1983	Positively significant
Reddy, 1987	,, ,,
Mahipal & Kherde, 1989	,, ,,

Devi (1994) reported that majority of agricultural labourers had high level of aspiration.

A positive relationship between level of aspiration and adoption was anticipated in this study.

Level of aspiration and perception

Padmanabhan (1981) observed that majority of agricultural labourers had very low level of aspiration and that they considered themselves to be in very low level of standard of living.

Fathimabi (1993) observed that level of aspiration had a positive and significant relationship with the utility perception of agricultural labourers about their welfare programmes.

Aspiration is the degree to which the individual sets his goals realistically in relation to his physical and mental attributes and in accordance with his environment.

Other studies establishsing the relationship between level of aspiration and feasibility perception of agricultural labourers or in similar areas, were not available. However, based on logical reasoning it is postulated that the level of aspiration would be positively related with feasibility perception.

2.7.16 Achievement motivation

Achievement motivation and adoption

Naik (1988) reported significant association between achievement motivation and extent of adoption of selected recommended practices in paddy.

Bonny (1991) found that achievement motivation was significantly contributing to the extent of adoption of commercial vegetable growers.

Reddy (1991) observed that achievement motivation had no association with the adoption level of registered cotton seed growers.

Sivanarayana and Jayaramareddy (1992) found out achievement motivation was not significantly related to the extent of adoption of small farmers in diversified farming.

Based on the above, a positive relation was postulated to exist between achievement motivation and adoption.

Achievement motivation and perception

Seema (1986) opined that achievement motivation had no significant relation with role perception, role performance and extent of participation of women in implementing the decisions.

Gowda (1989) reported that achievement motivation was positively associated with perceptions.

Anantharaman *et al.* (1986) found out significant direct effect of achievement motivation in managerial efficiency of cassava farmers in Kerala.

Sunilkumar (1993) observed that achievement motivation was not related with role perception of agricultural officers.

Alex (1994) observed significant positive correlation between achievement motivation and role perception.

Damodaran (1994) established significant contribution of achievement motivation with the perception about risk in banana cultivation.

On the basis of above, achievement motivation was believed to have a bearing on perception of individuals and on logical reasoning, a positive relation between these variables was postulated.

2.7.17 Management orientation

Management orientation and adoption

Patil (1985), Sreekumar (1985) and Syamala (1988) established positive and significant relationship between management orientation and adoption behaviour of farmers.

Bonny (1991) found out non-significant negative relationship between management orientation of commercial vegetable growers and their adoptive behaviour.

Ramachandran (1992) and Sakharkar *et al.* (1992) found out significant positive relationship between management orientation and adoption behaviour.

Sivanarayana and Jayaramareddy (1992) observed that management orientation had non-significant relationship with adoptive behaviour of small farmers in diversified farming.

On the basis of these in consistent findings, it was felt necessary to test the relationship in the context of the present study.

Management orientation and perception

Sudha (1987) reported no relationship between management orientation of farmers and their perception about lab to land programme.

Syamala (1988) reported that management orientation was positively and significantly related to the attitude of farmers towards demonstrated practices.

Damodaran (1994) revealed significant contribution of management orientation to perception about risk in banana cultivation.

For the present study, a positive relationship between management orientation and feasibility perception of agricultural labourers was postulated.

2.7.18 Extension orientation

Extension orientation and adoption

Gowda (1986) observed that extension participation was significantly associated with economic performance of contact farmers and fellow farmers.

Rameshbabu (1987) reported a significant association between extension participation and economic performance of grape growers.

Nandakumar (1988) established non-significant relation between extension participation and adoption.

Aswathanarayana (1989) reported that there was positive and highly significant association between extension contact and adoption of improved sericulture practices.

Satheesh (1990) observed a positive and significant relationship between extension participation and adoption of chawki rearing practices.

Reddy (1991) established a significant association between extension participation and adoption level of registered cotton seed growers.

Ramachandran (1992) found out significant positive relationship between extension orientation and adoption behaviour.

Sukarkar *et al.* (1992) revealed a positive association between extension participation and adoption behaviour of soybean growers.

Andrews (1994) found out positive direct effect of extension orientation on the extent of participation of women in sericultural operation.

Most of the studies indicated a significant relationship between extension participation and adoption, while some studies showed non-significant relationship. Therefore it would be interesting to study the extension orientation of agricultural labourers with respect to adoption of improved vegetable production technologies.

Extension orientation and perception

Sivakumar (1983) reported positive and significant association between degree of contact farmers with research station and research workers and their perception about research station and research workers.

Seema (1986) noted that contact with extension agency was important in explaining the role perception and role performance of farm women.

Sundaram (1986) found out positive correlation between extension contact and perception of farmers about the effectiveness of soil conservation practices.

Balan (1987) observed positive and significant relationship between extension participation and perception about soil testing.

Sudha (1987) revealed that there was positive significant relationship between extension orientation and perception about lab to land programme of both tribal and non-tribal participants.

Fathimabi (1993) established positive and significant relationship between contact with extension agency and their attitude towards welfare programmes.

Arulraj and Ulagalandan (1995) revealed that extension contact of sugarcane farmers was related positively to perception of the feasibility of early planting of the crop.

Based on the above, it can be predicted that extension orientation, with extension participation as its component, would influence perception of agricultural labourers.

2.7.19 Cosmopoliteness

Cosmopoliteness and adoption

Varying degrees of relationship have been established between the variable cosmopoliteness and adoption as summarised below:

Author and year	Nature of relationship
Gowder (1983)	Non-significant
Prakashkumar (1986)	Positively significant
Mahadevaiah (1987)	Positively significant
Aswathanarayana (1989)	Positively significant
Gopala (1991)	Positively significant
Krishnamoorthy (1991)	Non-significant
Rajendran (1992)	Positively significant
Sakkarkar *et al.* (1992)	Positively significant

Many research studies cited above pertaining to the influence of cosmopoliteness on adoption behaviour of farmers have pointed out a positive relationship. It would be appropriate to test this finding under the present study situation also.

Cosmopoliteness and perception

Jayasreemenon (1993) found that the role perception of group farming committee convenor was positively and significantly influenced by their cosmopoliteness.

Fathimabi (1993) observed that cosmopoliteness of agricultural labourers had a significant bearing on their utility perception about welfare programmes.

No other studies on the relationship between cosmopoliteness and perception could be traced. It would be interesting to assess the relationship between cosmopoliteness and feasibility perception of agricultural labourers. A positive relationship is anticipated for the study.

2.7.20 Information seeking behaviour

Information seeking behaviour and adoption

Godhandapani (1985) reported positive and significant relationship between information sources used and the extent of adoption.

Theodore (1988) opined that there was no significant relationship between information source used and adoption.

Sulaiman (1989), Athimuthu (1990), Chiprikar and Khuspe (1992), Geethakutty (1993) and Theodore and Mansingh (1994) established positive and significant relationship between information sources used and extent of adoption.

It would be appropriate to test these findings in the present study also and a positive relationship was anticipated.

Information seeking behaviour and perception

Kareem (1984) reported that role perception and role performance were positively and significantly correlated with the interpersonal communication behaviour of contact farmers.

Sundaram (1986) revealed that utilization of personal localite sources of information was not found to be significantly related to perception.

Balan (1987) reported that utilization of information sources was positively and significantly associated with the perception of farmers about utility of soil test recommendations.

Latha (1990) found out that utilization of interpersonal sources of information was having positive and significant relationship with the perception of users about the efficiency of biogas technology.

Fathimabi (1993) established significant positive relationship between mass media participation and utility perception.

Babu (1995) revealed a positive and significant relationship between information source utilization and evaluative perception of the respondents.

A positive relationship between this variable and feasibility perception was expected in this study also.

2.8 Knowledge of agricultural labourers on improved vegetable production technologies

Bloom *et al.* (1956) defined knowledge as those behaviours and test situations which emphasised the remembering either by recognition or recall of ideal material or phenomenon.

English and English (1958) defined knowledge as a body of understood information possessed by an individual or by a culture.

Knowledge in this study was operationaly defined as the body of information possessed by an agricultural labourer with respect to the different cultivation practices in vegetable production.

Godhandapani (1985) stated that majority of the irrigated groundnut growers had medium level of knowledge about nutrient recommendation.

Chenniappan (1987) stated that majority of irrigated cotton growers had medium level of knowledge on the practices recommended for irrigated cotton. The trend was from medium to high level of knowledge in general.

Patel and Jadhav (1987) in their study on onion growers revealed that most of the farmers did not have accurate knowledge of fertilizer requirements, pests and diseases and the appropriate control measures to be undertaken.

Aziz (1988) indicated that majority of farmers belonged to medium group in the case of knowledge about drought management practices of rice and coconut.

Bonny (1991) found out that majority of commercial vegetable growers had medium level of knowledge on improved vegetable cultivation practices.

Knowledge and adoption

Chiprikar and Kherspe (1992) found out that knowledge of grape growers was strongly and significantly related to adoption of grape production technology.

Geethakutty (1993) observed a positive and significant relationship between knowledge and adoption of rice management practices.

Nagabhushanam and Guruprasad (1994) noted that knowledge level played significant role in adoption of recommended practices by coconut growers.

Sureshkumar (1994) while analysing the participation of farm family women in marginal homestead farming systems pointed out that knowledge about scientific crop production influenced the nature and extent of participation in agricultural operations.

Susamma (1994) revealed that knowledge was significantly related to adoption of sericultural practices.

Theodore and Mansingh (1994) observed a negative and significant relationship between knowledge and extent of adoption of farmers.

Babu (1995) established a non-significant relationship between level of knowledge and extent of adoption of farmers.

On the basis of these findings, it was postulated that knowledge would be positively related to the extent of adoption of agricultural labourers.

Knowledge and perception

Seema (1986) observed that knowledge in farming contributed significantly to variations in role perception.

Sundaram (1986) noted that knowledge was having positive correlation with the perception of farmers about the effectiveness of soil conservation practices.

Alex (1994) revealed that knowledge about scientific agricultural practices had significant positive correlation with role perception of agricultural laboaurers.

There was a dearth of studies pertaining to the relationship between knowledge and perception. From the above studies, it is explicit that the influence of knowledge on the act of perception is in consistent. So it would be interesting to study the relationship between knowledge and feasibility perception of agricultural labourers.

2.9 Training needs of agricultural labourers

Rao (1969) defined farmers training as an intensive learning activity for a group of selected farmers assisted by competent trainers to understand and practise

the skills required in the adoption of new technology at a place where appropriate facilities exist and at a time and duration considered suitable by them.

Talbot (1975) interpreted training need in terms of skill and knowledge requirements resulting from change or expected change. He explained training need as a reactive need.

Alexander (1985) in his study on the training need of small rubber growers observed that areas in which the small growers preferred to undergo training both in knoweldge and skill aspects were plant protection, manures and manuring and plant propagation in that order.

Babu and Singh (1986) studied the crop wise training needs of young farmers which showed than an overwhelming majority of farmers wanted information on pulse crop followed by wheat and vegetables.

Mathiyazhagan and Singh (1986) reported that banana growers expressed highest training need in manuring and fertilizer application. Other areas in which training need was perceived as the most needed by respondents in descending order were propagation, prunning and desuckering, plant protection improved varieties of banana and storage.

Bhatnagar (1987) remarked that in training, focus is on learning by an individual new ways of doing things in terms of better performance and the transfer of learning in work situation directed to greater organisational effectiveness. Training need is actually the difference between 'what is' and 'what ought to be'.

Kanakasabapathi (1988) showed that nearly half of the tribal farmers perceived only a low level of training need. With regard to the perception of training need in respect to major operations in general plant protection was perceived as the area having the most important training need.

Bonny (1991) found out that majority of farmer respondents (70%) had medium level of training need perception in improved vegetable cultivation practices. The highest level of training need was perceived in the area of plant protection measures followed by manures and manauring.

Vinayakareddy (1991) revealed that majoarity of seed growers expressed their need for training in identification of off type plants in early stage of the crop growth, proper identification of pests and diseases and their control and application of correct dose of fertilizers.

2.10 Conceptual frame work for the study

The main objective of conceptual frame work developed here is to provide a perspective reference for systematically analysing the feasibility perception and utilization of improved vegetable production technologies by agricultural labourers as influenced by a multiplicity of personal, socio-cultural and techno-economic factors, constraints and consequences of utilizations.

The conceptual frame work developed is depicted in Fig. 1. It is expected to facilitate theoretical and empirical analysis of the dependent variables.

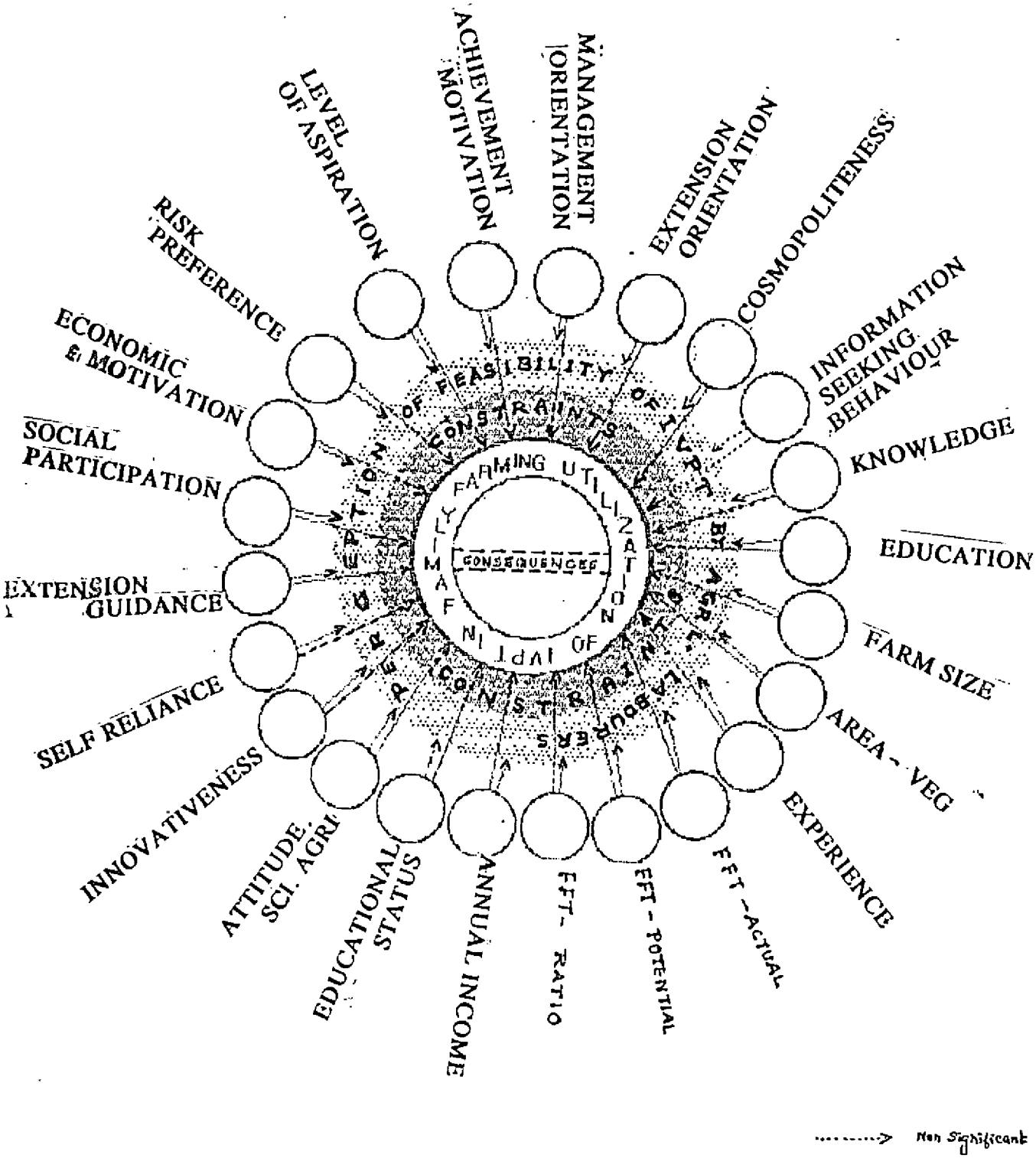


FIG. 1. Conceptual frame work for the study

2.11 Hypotheses for the study

Based on review of literature and conceptual frame work, the following null hypotheses were derived for the study.

a. There would be no significant relationship between the personal, socio-cultural and techno-economic characteristics of agricultural labourers and their perception of feasibility of improved vegetable production technologies.

b. There would be no significant relationship between the personal, socio-cultural and techno-economic characteristics of agricultural labourers and their utilization of improved vegetable production technologies in family farming.

Methodology

METHODOLOGY

The methodology employed for the study is furnished in under the following main heads.

3.1 Research design

3.2 Locale of the study

3.3 Selection of the sample

3.4 Improved practices in vegetable cultivation selected for the study

3.5 Operationalisation and measurements of variables

3.6 Training needs of agricultural labourers with respect to improved vegetable production technologies (IVPT)

3.7 Constraints faced by agricultural labourers in the utilization of improved vegetable production technologies

3.8 Consequences perceived by agricultural labourers in the utilization of improved vegetable production technologies

3.9 Methods used for data collection

3.10 Statistical tools used for the study

3.1 Research design

Research designs are developed to enable the researchers to answer questions as validly, objectively, accurately and economically as possible. This study, with the main objective of analysing the feasibility and utilization of vegetable production technologies in family farming by agricultural labourers was conducted, adopting an ex-post-facto research design. Ex-post-facto research is a systematic empirical enquiry in which the scientist does not have direct control over the

independent variables because their manifestation have already occurred or because they are inherently not manipulable (Kerlinger, 1973).

Inferences about relations among variables are made without direct intervention, from concomitant variation of independent and dependent variables. In this research study, since the manifestation of the independent variables had already occurred and there was no scope for manipulation of any variable, ex-post-facto research design was resorted to.

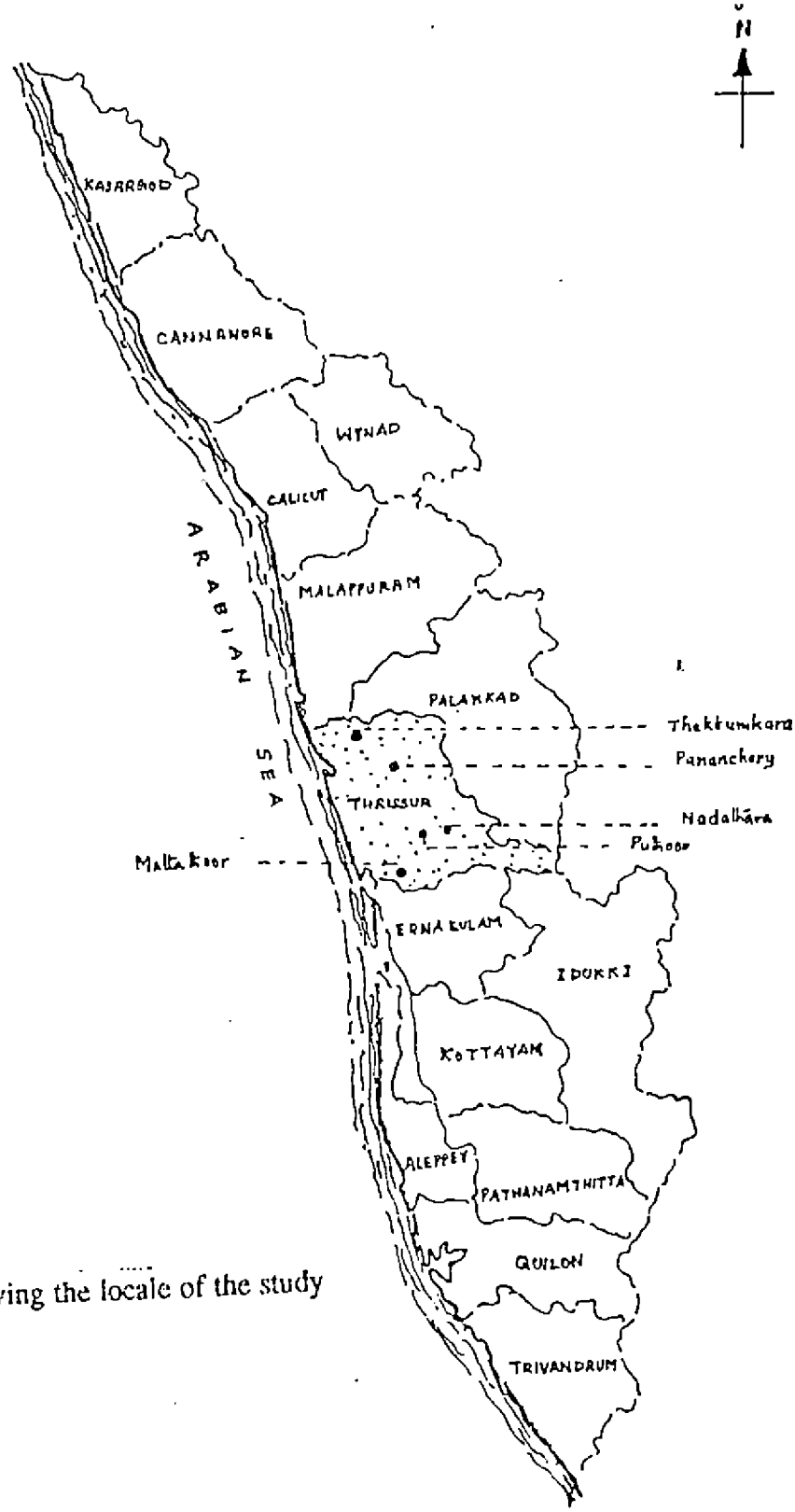
3.2 Locale of the study

The study was conducted in Thrissur district of Kerala. There were 3 sub-dicisions and 17 blocks in Thrissur district. A list of panchayats in Thrissur district with area under vegetables was collected from the Department of Agriculture. Five panchayats were selected using probability proportionate to area under vegetables. Thus the study was confined to these five panchayats namely Panamchery, Puthur, Nadathara, Mattathur and Thekkumkara.

The map showing the locale of the study area is presented in Fig.

3.3 Selection of the sample

In each panchayat, ward-wise area under vegetables was collected from the respective Krishi Bhavan. After deleting wards with negligibly small area under vegetables, four wards were selected for the study from each panchayat at random. A list of agricultural labourers growing vegetables was prepared for each ward and a sample of 20 agricultural labourers was selected from each panchayat, the total being distributed to the wards selected in proportion to area under vegetables. Thus, there were 100 agricultural labourers selected as respondents from the five panchayats.



Map of Kerala showing the locale of the study

3.4 Improved practices in vegetable cultivation selected for the study

With a view to select crops and related improved practices, a pilot study was conducted in non sample area of the district. Thirty respondents were selected for the pilot study. The list of different vegetables grown in these housesteads was collected using an interview schedule prepared for the study. Finally Brinjal, Bittergourd, Pumpkin, Amaranthus and Bhindi were selected for the study. The selection of improved practices in vegetable cultivation was done mainly based on the Package of Practices Recommendation and also on the basis of discussions with the experts in vegetable production in the Kerala Agricultural University. Accordingly, the following improved practices were selected under each crop.

A. Brinjal

1. Spacing of 60 cm x 75 cm
2. Improved varieties
3. Transplanting at 30-45 DAS
4. Manures and Manuring
   a) Fertilizer dose of 75:40:25
   b) Split application of N & K
5. Plant protection measures

B. Bittergourd

1. Spacing
2. Varieties
3. Manures and manuring
   a) Fertilizer dose of 70:25:25
   b) Split application of 'N'

4. After cultivation

5. Plant protection measures

C. Amaranthus

1. Improved varieties

2. Spacing at transplanting

3. Manures and manuring

4. Foliar fertilization

5. Plant protection measures

D. Bhindi

1. Improved varieties

2. Spacing (60 x 30 cm for summer crop)

(60 x 45 cm for Kharif crop)

3. Seed soaking

4. Manures and manuring

5. Plant protection measures

E. Pumpkin

1. Improved varieties

2. Spacing (4.5 x 2.0)

3. Manures and manuring

4. After care

5. Plant protection measures

Based on the results of the pilot study the final schedule was prepared and information were collected from 100 respondents.

3.5 Operation and measurement of variables

The very objective of the study necessitated the selection of the following two key variables as:

a) Feasibility of vegetable production technologies as perceived by Agricultural labourers.

b) Utilization of vegetable production technologies by the agricultural labourers.

In order to assess the influence of the profile characteristics of the agricultural labourers on the utilization of vegetable production technologies by them, the characteristics of agricultural labourers for the study were identified as detailed below.

Based on the review of literature, a list of 39 variables seemingly related to the utilization of agricultural technologies was prepared. The list of variables was sent to 100 judges, comprising mostly extension scientists working in transfer of technology projects of various Agricultural Universities in India. They were asked to rate the relevancy of each variable on a five-point continuum ranging from most relevant, more relevant, relevant, less relevant and least relevant with the weightages of 5, 4, 3, 2 and 1 respectively. Out of the 100 judges only 48 responded.

The final variables were selected based on the criterion of mean relevancy score, which was obtained by summing up the weightages obtained by a

variable and dividing it by the number of judges responded. The variables with their mean relevancy scores above the average mean relevancy scores were selected for the study. Accordingly, twenty three variables viz. Education, Farm size, Area under vegetables, Experience in vegetable cultivation, Family farming time per day, Annual income, Family educational status, Attitude towards scientific agriculture. Innovativeness, Self reliance, Extension guidance, Social participation economic motivation, Risk preference, level of aspiration, Achievement motivation, Management orientation, Extension orientation, Cosmopoliteness, Information seeking behaviour and knowledge were selected for the study.

3.5.1 Operationalisation and measurement of feasibility and utilization

3.5.1.1 Feasibility of agricultural technologies

Feasibility of agricultural technologies refers to the perception of the farmer in terms of the degree to which the technology is capable of being used or dealt with successfully under the existing conditions.

Theodorson and Theodorson (1970) defined perception as the selection, organisation and interpretation by as individual of specific stimuli in situation according to prior learning, activities, interests and experiences.

Thakar *et al.* (1970) developed a scale to measure the perception of extension personnel about the objectives of package programme. They asked the respondents to rate a set of objectives on a five point scale with responses as unimportant, not very important, undecided, important and very important.

Sudha (1987) developed a scale to measure perception about lab-to-land programme. A set of fourteen statements related to the perceptual field of the

programme were prepared on a four point continuum with the scoring pattern being, very effective-4, effective-3, less effective-2 and least effective-1.

In the present study, perception was measured using an arbitrary scale developed for the purpose. The scale is considered as arbitrary since the vigorous procedures of standardisation by estimating reliability and validity of the scale were not attempted in the present scale. However, an attempt was made to make the scale as scientific as possible. Feasibility of each selected practice was measured in a four point continuum of 'very much feasible', 'moderately feasible', 'less feasible' and 'not feasible' with a score of 3, 2, 1 and zero respectively. Thus a respondent will get a maximum score of 1.5 for 5 practices under a crop and a total of 75 for the five crops together. To get the feasibility Index of a respondent the total feasibility score was devided by the number of vegetable crops that he grows. For this, the selected crops only were considered.

3.5.1.2 Utilization of agricultural technologies

The concept of utilization, in the present study, refers to the acceptance of the practice by the farmer which is synonymous to the concept of adoption that is widely used in the transfer of technology process.

A review of the measurement procedure for adoption revealed that there are various measures developed and used for measurement ranging from simple to complex measurement procedures.

Wilkening (1952) developed an index for measuring adoption of improved farm practices. The index of adoption used was the percentage of practices adopted to the total number of practices applicable to a farmer.

Beal and Rogers (1960) developed an adoption scale for measuring adoption of a practice which credited an individual with a score of one for adoption and zero score for non-adoption of the practice.

Chathopadhyay (1963) used adoption quotient for measuring adoption behaviour. This is a ratio scale that measures behaviour on dimension of applicability, potentiality, extent time, consistency and differential nature of innovation.

Sengupta (1967), measured the general adoption level of respondents, firstly assigning equal weights for each of the practices considered and then credited with two scores for the correct adoption of the practice, one score for partial adoption and zero score for non-adoption of the concerned practice.

Singh and Singh (1974) used an adoption quotient which was a modification of the one developed by Chathopadhyay (1963). According to this, adoption quotient of each respondent was calculated by using the formula.

$$AQ = \frac{\Sigma\, e/p}{N} \times 100$$

where AQ - Adoption Quotient

e - Extent of adoption of each practice

p - Potential for adoption of each practice

N - Total number of practices selected

Since the intricacies of utilization of practices by agricultural labourers were not known and the data on different components of adoption like potentiality,

time, etc. could not be meaningfully interpreted, it was decided that a simple procedure may be followed to measure the adoption pattern of the respondents.

For each of the practices selected, equal weights were assigned. The proper utilization of the practice based on the Package of Practices Recommendation of Kerala. Agricultural University was credited with two scores; improper adoption with one score and non-adoption with zero score. Accordingly, for each selected crop, the utilization score ranged from 0 to 10 as five practices were included under each crop. To get the adoption index of a respondent, the total utilization score was divided by the number of selected crops that he raised under family farming. Thus the maximum obtainable utilization index was 10.

3.5.2 Operationalisation and measurement of Independent variables

1. Education

It refers to the extent of informal or formal learning received by the agricultural labourers. The differents educational levels of the respondents were scored as per the procedure followed in the socio-economic status scale of Trivedi (1963). The scoring procedure was as follows.

Level of education	Scores
Illiterate	0
Can read only	1
Can read and write	2
Primary school	3
Middle school	4
High school	5
Collegiate	6

2. Farm size

Farm size is defined as the total area of land in cents owned by the agricultural labourers.

3. Area under vegetables

It is operationalised as the area under vegetable family farming measured in cents.

4. Experience in vegetable cultivation

It is operationalised as the total number of years since the agricultural labourer is engaged in vegetable farming.

5. Family farming time

It is the extent of free time available to an agricultural labourer per day which can be utilized for family farming. In this study it is measured in terms of the total number of hours available to the family as a whole.

It is measured under three dimensions.

a) Family Farming Time (Actual) : which is the actual number of hours (FFT-A) at the disposal of the family that is being utilized for family farming.

b) Family Farming Time (Potential) : which is the proportion available at the disposal of the members for family farming (FFT-P) the members of the farm farming.

c) Family Farming Time (Ratio) : This was measured as the ratio of FFT-A to FFT-P.

6. Annual Income

It was operationalised as the total annual income obtained by the respondent from agriculture and other sources.

7. Family Educational Status

It was operationalised as the mean education status of the family of the respondent at the time of investigation.

To measure the family educational status, the respondent was asked to give the details regarding educational status of the family members. The same scoring pattern as in the case of educational status was used to measure this variable. The scores obtained for all the members were summed up. The summated scores divided by the number of effective members (above five years) gave the family educational status score.

8. Attitude towards scientific agriculture

It was operationally defined as the degree of positive or negative affect of an agricultural labourer towards scientific agricultural practices.

This was measured by using the scale developed by Alex (1994); with appropriate modification to suit the context of the study.

The scale was administered to the sample and the responses were collected on a five point continuum as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree' with scores 5, 4, 3, 2 and 1 respectively for positive statements. The scoring pattern was reversed in the case of negative statements. The

scores of all the 14 statements were summated to get the attitude score of each individual. The possible attitude score of an individual ranged from 14 to 70.

9. Innovativeness

It was operationalised as the degree to which an agricultural labourer is relatively earlier in adopting new ideas.

The procedure developed by Singh (1977) and adopted by Selvanayagam (1986) was used to measure innovativeness of a farmer.

The question "When would you prefer to adopt an improved practice in farming"? was employed. The scoring procedure was as given below.

Response	Score
1. As soon as it is brought to my knowledge	3
2. After I have seen some other farmers using it successfully	2
3. Prefer to wait and take my own time	1

10. Self reliance

It is operationalised as the extent of one's own belief confidence, credence, dependance or faith to control the span of life for future. For the measurement of this variable the procedure followed by Prasad (1983) and later modified by Manandhar (1987) was used. The question used to measure this variable is "how much of your future you feel depends on yourself"? out of 100, please indicate on one of the following items.

Items	Scores
100 per cent	5
75 per cent	4
50 per cent	3
25 per cent	2
Non at all depedent	1

11. Extension guidance

For this study, extension guidance was operationalised as the degree of guidance actually received by the agricultural labourers directly from the various extension personnel in relation to adoption of the various practices in vegetable family farming.

The procedure developed by Desai (1981) was used for the measurement of this variable. Extension guidance was quantified taking into account how much guidance or advice each respondent had received in various activities during the year prior to the investigation. This was measured by getting the responses for two statements related to two activities viz. how much of extension guidance was received during the last one year and how much useful the guidance was for them. The respondents' response was recorded in a three point continuum for the two statements.

The scoring procedure was as follows.

a) Technical guidance received during the last one year was :

Very adequate	Adequate	Not adequate
3	2	1

b) Technical guidance received was :

Verymuch useful	Much useful	Least useful
3	2	1

The scores obtained were summed up to get the respondent's score.

13. Social participation

Social participation refers to the degree of involvement of the respondent in formal organisations either as a member or as an office bearer. The scale used by Subramonian (1986) was followed with necessary modifications to suit the present study. Social participation was measured in terms of the membership of the individual in the organisations as well as his frequency of participation in these activities. The scoring pattern was as follows.

A score of 2 for official position and a score of 1 for mere membership were given in the case of each organisation. Scores 2, 1 and 0 were given for attending the activities of each organisation 'regularly', 'occassionally' and 'never'. To obtain the final score of the respondent, the scores given as the member or office bearer were multiplied with scores given for attendance in the activities and added up for all organisations. The respondents were then classified in to low or high groups based on the mean score obtained.

14. Economic motivation

Economic motivation refers to the extent to which an individual is oriented towards achievement of the maximum economic ends such as maximisation of farm profit.

This was measured using Supe (1969) scale with modification in the scoring procedure. Instead of five point continuum of response as developed by Supe, a dichotomy of Yes or No pattern was used in this study as done by Prasad (1983). The scale consisted of six statements of which first five statements are positive while the last one is negative. A score of 'I' has been assigned for the 'Yes' response and 'O' score for 'No' response in the case of positive statements. The scoring procedure was reversed in the case of negative statement. The scores obtained on each statements were cumulated to obtain the total score of a respondent on this variable.

15. Risk preference

Rish preference was operationalised as the degree to which an agricultural labourer is oriented towards risk and uncertainity and portrayed the courage to face the problems occurring.

The scale developed by Singh (1977) and adopted by Selvanayagam (1986) was used with slight modification for measuring risk preference in the present study. There were three statements included in the scale of which the first statement was positive and the other two negative. Based on the response of each statement a

terms of agree/disagree, the scores 1 and 0 were given for the positive statement and 0 and 1 for the negative statements, respectively.

The total score obtained by the respondent was taken as his risk preference score.

The scores ranged between zero and three.

16. Level of Aspiration

Level of aspiration was operationally defined as the possible goal an agricultural labourer sets himself in his performance.

Cantril and Free (1962) developed a self anchoring striving scale for measuring the general level of aspiration.

Chathopadhyaya (1963) used a semi structured projective technique to measure the level of aspiration of farmers.

Self anchoring striving scale developed by Cantrill was used in this study for measuring the level of aspiration. A figure of ladder with 10 steps was shown to each respondent with the explanation that the top of the ladder represented the best possible (score 10) and the bottom one represented the worst possible life for an individual (score 1). He/she was then asked to indicate a step on the ladder where he stood for each of the three time spans: a) at the present time (present) (b) five years before (past) and (c) five years from now (future). The scores were given corresponding to the steps indicated by the respondent and the scores on the present, past and future were calculated separately. With a scoring procedure of 10 scores, each time span will have a total score which ranged from 1 and 10.

17. Achievement motivation

Achievement motivation was operationally defined as the spontaneously expressed desire of an agricultural labourer to do something well for its own sake rather than to gain power, recognition or profit.

Achievement motivation scale developed by Singh (1974) was used for measuring this variable. It is a six item scale with five alternative responses to each item. The respondent was asked to select one of the alternatives for each item. The scoring was done using the method of summated rating. The respondents were then categorised in to low or high based on the mean value obtained.

18. Management orientation

Management orientation is operationalised in this study as the degree to which an agricultural labourer is oriented towards scientific farm management. Comprising planning, producion and marketing function in vegetable production under family farming.

For the measurement of this variable, a scale developed by Samantha (1977) was used. It consisted of eighteen statements, six each for planning, production and marketing orientation. Under each group, positive and negative statements are mixed retaining at the same time a more or less psychological order of the statements. For positive statements a score of one was assigned for agreement and zero for disagreement. For negative statements the scoring system was reversed. The scores were summed up, corresponding to the response pattern which gives the management orientation score of that respondent.

19. Extension orientation

This is operationally defined as the extent of contact of an agricultural labourer with different extension agencies and his participation in various extension activities or programmes like meetings, seminars, etc; organised by these agencies. The method followed by Kareem (1984) was used for quantifying this variable. The extension orientation was measured on two dimensions, viz. extension contact and extension participation.

Extension contact is operationalised as the frequency of contact of the individual respondent with different extension personnel. The categories of extension personnel included in the study were Assistant Directors of Agriculture; Agricultural officers and Agricultural Assistants. The frequency of contacts was assessed by using scoring procedure of Kareem (1984) with slight modification.

Sl.No.	Category of response	Score
1	Twice or more a week	4
2	Once a week	3
3	Once a fortnight	2
4	Once a month	1
5	Never	0

Extension participation is defined as the frequency of participation of the individual respondent in different extension activities conducted for the past one year. Extension activities conducted to evaluate the extension participation of the respondents were study tours, seminars, farm fair, meetings of the group, demonstrations and others.

The respondents participation in the above extension activities for the past one year is the index used to arrive at extension participation scores as below:

Sl.No.	Category or Response	Scores
1	Attended whenever conducted	2
2	Attended occasionally	1
3	Never attended	0

The scores obtained for both the sub-items by each respondent was calculated and the total score for extension orientation was obtained by summation of these two scores.

20. Cosmopoliteness

Cosmopoliteness in defined as the degree to which an agricultural labourer is oriented to his immediate outside social system. The cosmopolite farmer is likely to be a changed individual in that he is motivated to look beyond his environment while others continue to maintain a localistic frame of reference.

This variable was measured using the scale developed by Desai (1981). The dimensions of the variable were considered in this case:

a) the frequency of visit to the nearest town

b) the purpose of visit to the town

The items and scoring pattern followed were as shown below:

a) Frequency of visits to the nearest town

	Items	Score
1	Two or more per week	5
2	Once per week	4
3	Once in fifteen days	3
4	Once in a month	2
5	Seldom	1
6	Never	0

b) The purpose of visit

Items	Score
1. All visits relating to agriculture	5
2. Some relating to agriculture	4
3. Personal/domestic	3
4. Entertainments	2
5. Others	1
6. No response	0

The cumulated maximum score obtainable was 10 and the minimum was zero.

21. Information seeking behaviour

This was operationalised as the extent to which an agricultural labourer seeks information regarding vegetable production from different communication sources. The procedure followed by Nair (1969) was adopted with modification to

suit the specific requirements of the study. Information seeking behaviour was assessed both in terms of frequency and purpose. The score for frequency of use of sources/channels for seeking information ranged from 4 to 1 for 'regular', 'sometimes', 'rarely' and 'never' in order. If purpose of information seeking was for package of practices for all crops including vegetable crops, a score of 2 was assigned where as unit score was assigned if the purpose is for vegetable crops alone. The scores obtained for the purpose and frequency of use of the sources by the individual in seeking information from each source/channel reported under personal-cosmopolite, personal-localite and mass media sources were summed up to arrive at the total score for information seeking behaviour for each individual. The maximum score would indicate more information seeking behaviour and vice versa.

22. Knowledge on Improved Vegetable Production Technologies

For the purpose of this study, 'knowledge' was operationalised as the knowledge status of the agricultural labourers regarding Improved Vegetable Production Technologies (IVPT).

Knowledge test

Cronbach (1949) defined knowledge test as one in which procedures, apparatus and scoring have been fixed so precisely that the same test can be given at different times and places. A standard knowledge test is defined by Knoll (1957) as one that has been carefully constructed by experts in the light of acceptable objectives or purposes and procedures for administering, scoring and interpreting scores which are specified in detail so that the results should be comparable and norms and averages for different age and status have been predetermined.

In this study, the extent of knowledge of agricultural labourers about IVPT was measured using a knowledge test developed for the purpose. The steps followed in developing the knowledge test are described below.

Collection of items

The content of a knowledge test is composed of questions called items. An item pool of questions was prepared by reviewing literature such as the Package of Practices Recommendations of the Kerala Agricultural University (1993) and conducting discussion with the subject matter specialists. Finally a thorough scrutiny of the item pool was made with the assistance of the subject matter specialists. The selection of items was done on the basis of the following criteria.

1. The items should promote thinking.
2. It should differentiate the well informed agricultural labourer from the poorly informed ones and
3. It should have a certain difficulty index.

Twenty five items (questions) which covered all aspects of IVPT of the five crops selected were subjected to item analysis for developing a standardised knowledge test (Appendix-II).

Item analysis

The initially prepared twenty five items were checked to thirty respondents prior to the preparation of the final schedule. The respondents were randomly selected agricultural labourers who were altogether different from the sample selected for the main study and at the same time having identical conditions.

Item analysis yields two kinds of information, item difficulty and item discrimination. The index of item difficulty reveals how difficult an item is where as the index of discrimination indicates the extent to which an item discriminates the well informed individuals from the poorly informed ones.

Scores of values one and zero were given to correct and incorrect responses respectively. There was thus a possibility of respondents scoring a maximum of twenty five points for all correct answers and zero for all wrong answers.

The scores obtained by the thirty respondents were arranged in the descending order of total scores, from the highest to the lowest and the respondents were devided into three equal groups arranged in descending order of total scores obtained by them. The three groups were G_1, G_2 and G_3 with ten respondents in each group. For item analysis, the middle group, namely G_2 was eliminated retaining only the terminal ones with high and low scores.

The data pertaining to correct responses for all the items in respect of these two groups G_1 and G_3 were tabulated and the difficulty and discrimination indices calculated (Appendix-IIb).

An example of the calculation of the difficulty and discrimination indices is presented below.

Table 1
Difficulty and discrimination index of knowledge tests itmes

Item number in the initial tests	Frequency of correct answers		Total frequencies	Percentage of respondents going correct answers (P)	$E^{1/3}$
	S_1	S_3			
9	8	4	12	40.00	0.40
15	3	2	5	16.66	0.10
18	2	1	3	10.00	0.10
24	8	3	11	36.66	0.50

P = index of item difficulty

$E^{1/3}$ = index of discrimination

$$E^{1/3} = \frac{(S_1) - (S_3)}{N/3}$$

where S_1 and S_3 are the frequencies of correct answers in the group G_1 and G_3 respectively.

N = Total number of respondents in the sample

Substituting the value for item number (9) of the above table, the value arrived at was:

$$E^{1/3} \text{ for item } 9 = \frac{8-4}{30/3} = 0.40$$

Calculation of item difficulty index

The index of item difficulty was worked out in this study refers to the percentage of the respondents answering an item correctly. As Coombs (1950) pointed out, the difficulty of an item varied for different individuals. In the present study, the items with P value ranging from 25 to 75 were considered for final selection for knowledge test.

Calculation of Discrimination Index

The second criterion for item selection was the discrimination index indicated by $E^{1/3}$. Mehta (1958) in using $E^{1/3}$ method to find out item discrimination values emphasised that this method was somewhat analogous to, and therefore, a convenient substitute for the phi coefficient as formulated by Ferry and Michael (1951). In the present study, the items with $E^{1/3}$ values above 0.40 were considered for the final selection as defenite criterion of selection is not advocated by any researcher. In their studies, Lokhande (1973), Reddy (1976), Sadamate (1978) and Pillai (1983) had put these units as 0.35 to 0.55, 0.17 to 0.79, 0.12 to 0.87 and 0.35 to 0.50 respectively. The selected 14 items for the final format of the knowledge test are given in Appendix

Reliability

The split-half method was used to test the reliability of the test. All the 14 items of the knowledge test were divided into two, one having seven odd numbered items and the other with seven even numbered items and were administered to thirty respondents. The coefficient of correlation between the two sets of scores was 0.76 which was significant at 1 per cent level of probability. This indicated that the reliability of the test was high.

Content validity

Content validity is a kind of validity by assumption as described by Guilford (1971). Care was taken to include items covering the entire universe of relevant aspects of knowledge of agricultural labourers on improved vegetable

production Technologies. Items were collected through various sources such as scientists of Kerala Agricultural University and officials of the State Department of Agriculture. Hence it was assumed that the tests could measure the knowledge of the respondents with validity.

Method of scoring

Fourteen items were included in the knowledge test. Each respondent was given one score for correct answer and zero score for incorrect answer. The total knowledge score for each respondent was calculated by summing up the scores given for each item. Thus the maximum knowledge score that could be obtained by a respondent was 14 and the minimum zero. The respondents were then categorised as low and high on the basis of the mean value obtained.

3.6 Training needs of agricultural labourers with respect to improved vegetable production technologies

Training need was assessed following different measurements procedures by different investigators as indicated below.

i) Index of consensus (Cq)

Index of consensus was given for use on nominal and ordinal categories. This can be used when training needs were collected on different tasks and activities from trainees and supervisors on the same items and when each respondent makes but one choice only, in which case the consensus index can be worked out for each category of respondents.

The formula for calculating index of consensus is

$$Cq = \frac{f^1 - c^1 f}{F\,(c-1)}$$

Cq = consensus index

f = mean frequencies of persons preferring each category

c^1 = No. of categories with frequencies exceeding f

c = Total number of frequency categories

f^1 = category frequency larger than f

F = total frequency

ii) Training Need Quotient (TNQ)

For assessment of training needs of extension officers, Sharma and Singh (1970) developed a simple ratio scale (training need quotient) which accomodates variations in a number of items. The formula for calculating TNQ is

$$TNQ = \frac{Osij}{Msij} \times 100$$

where

Osij - sum of observed scores of j^{th} individual for i^{th} item

Msij - maximum score attributable to the items rated by j^{th} individual.

iii) Training need score

Gill and Sandhu (1981) measured training need using training need score. This measures the gap between knowledge and skills possessed by the farmers and needed by them as per the recommendation in selected subject matter areas. The training need score is measured using the formula,

TN score = 1 - Average of knowledge and skill score

$$\text{Average knowledge and skill score} = \frac{\text{Total knowledge score}}{\text{No. of question x No. of respondents}}$$

In the present study, the training need in major subject matter areas relating to vegetable crops was assessed using a three point rating scale with 'most needed', 'necessary' and 'least needed' with corresponding scores of 3, 2 and 1 as adopted by Kanakasabapathi (1988).

The important subject matter areas of vegetable cultivation where in the training need was assessed was finalised based on the recommendations of Package of Practices of Kerala Agricultural University (1993) and discussions with experts. The identified subject matter areas were:

1. Improved varieties of crops
2. Nursery practices
3. Seed rate and sowing
4. Manures and fertilizers
5. Planting and after care
6. Plant protection measures
7. Irrigation
8. Harvesting and post harvest aspects

The frequencies of each response category were multiplied by the score allotted to it and the cumulative score for each practice was worked out. Based on the cumulative scores, the practices were ranked.

3.7 Constraints experienced by agricultural labourers in the adoption of improved vegetable production technologies (IVPT) in family farming

Based on the discussion with agricultural labourers and also through review of relevant literature, some of the constraints faced by agricultural labourers were collected. A list containing thirteen such constraints were included in the final interview schedule.

The response to each constraint was obtained on a four point continuum viz. most important, important, less important and least important; with weights 4, 3, 2 and 1 respectively. For each constraint, the frequency of response under various points in the continuum were multiplied with the respective weights and added to get a cumulative index for that particular constraints. Based on the cumulative scores obtained, the important constraints were identified.

3.8 Consequences perceived by agricultural labourers as a result of their utilization of IVPT in family farming

Based on pilot study and relevant literature, some of the consequences of utilization of IVPT by agricultural labourers in family farming were selected. Thirteen of these consequences were listed in the final interview schedule.

The response to each consequence was obtained on a four points continuum viz. most important, important, less important and least important, with weights 4, 3, 2 and 1 respectively. For each consequence, the frequency of responses under various points in the continuum were multiplied with the respective weights and added to get a cumulative score. Based on the cumulative scores, the major consequences were identified.

3.9 Methods used for data collection

A pre-tested, structured, interview schedule containing appropriate questions for obtaining the required data was prepared. The interview schedule was discussed with a group of experts and necessary modifications were made to avoid ambiguity and redundance in the questions. The schedule was pre-tested before it was finalised. The data were collected through personal interview method by the researcher had developed adequate rapport with the respondents before the interview.

3.10 Statistical tools used for the study

The following statistical techniques were used in the analysis of data.

Mean

The respondents were grouped into categories with reference to the means of the independent variables. After grouping the respondents into two categories, the frequency of agricultural labourers falling in each category and respective percentages were worked out.

Correlation analysis:

Correlation co-efficient was worked out to measure the degree of association between the feasibility and utilization of IVPT and different explanatory variables.

In order to test the significance of the observed correlation coefficient, the students 't' test at (n = 2) degrees of freedom was used.

Step down Regression Analysis

Step down Regression Analysis was carried out to trace the independent variables contributing maximum variability in the dependent variables.

Multiple Linear Analysis (MLR)

Multiple Linear Regression Analysis was carried out to find out the relative contribution of each of the personal, socio-cultural and techno-economic characteristics on the dependent variables (T_1) and (T_2). The high R^2 values and the significant R value suggest the desirability of regression analysis in predicting the dependent variable.

Multi variate path coefficient analysis

Path analysis explains the cause and the effect relationship between dependent and independent variables. This was originally developed by Wright (1921) followed by Li (1955) and Singh and Choudhary (1979) to know the nature of influence with direct and indirect effect of the personal, socio-cultural and techno-economic factors on the dependent variable. Path coefficient can be defined as the ratio of the standard deviation of the effects due to a given cause to the total standard deviation of the effect.

Results and Disc

RESULTS AND DISCUSSION

The findings of the study and the discussions there on are presented in this chapter under the following heads.

4.1 Profile analysis of agricultural labourers on their personal, socio-cultural and techno-economic characteristics

4.2 Perceived feasibility of improved vegetable production technologies by agricultural labourers

4.3 Extent of utilization of Improved Vegetable Production Technologies by agricultural labourers in family farming

4.4 Influence of the personal, socio-cultural and techno-economic factors of agricultural labourers on feasibility perception

4.5 Influence of personal, socio-cultural and techno-economic factors of agricultural labourers on the utilization of improved vegetable production technologies

4.6 Training need of agricultural labourers on improved vegetable production technologies

4.7 Major constraints perceived by the agricultural labourers in the utilization of improved vegetable production technologies

4.8 Consequences perceived by agricultural labourers to their utilization of improved vegetable production technologies in family farming

4.1 Profile analysis of agricultural labourers on their personal, socio-cultural and techno-economic characteristics

Table 1. Distribution of respondents based on their personal, socio-cultural and techno-economic factors

Sl. No.	Variable	Category	Range	Frequency percentage
1	2	3	4	5
1	Education	Low	< 2.56	53
		High	2.56 and above	47
2	Farm size	Low	< 16.0	41
		High	16 and above	59
3	Area - vegetable	Low	< 7.27	60
		High	7.27 and above	40
4	Experience - vegetable	Low	< 6.94	55
		High	6.94 and above	45
5	FFT - Actual	Low	< 7.22	59
		High	7.22 and above	41
6	FFT - Potential	Low	< 11.79	49
		High	11.79 and above	51
7	FFT - Ratio	Low	< 0.58	60
		High	0.58 and above	40
8	Annual income	Low	< 11.310	57
		High	11.310 and above	43
9	Educational status	Low	< 3.44	56
		High	3.44 and above	44
10	Attitude towards scientific agricultue	Low	< 36.61	68
		High	36.61 and above	32
11	Innovativeness	Low	< 1.84	41
		High	1.84 and above	59
12	Self reliance	Low	< 2.87	46
		High	2.87 and above	54

Contd.

Table 1. Continued

1	2	3	4	5
13	Extension guidance	Low High	< 3.2 3.2 and above	66 34
14	Social participation	Low High	< 5.03 5.03 and above	73 27
15	Economic motivation	Low High	< 3.36 3.36 and above	61 39
16	Risk preference	Low High	< 1.95 1.95 and above	40 60
17	Level of aspiration	Low High	< 5.15 5.15 and above	62 38
18	Achievement motivation	Low High	< 17.57 17.57 and above	60 40
19.	Management orientation	Low High	< 11.64 11.64 and above	39 61
20	Extension orientation	Low High	< 12.9 12.9 and above	46 54
21	Cosmopoliteness	Low High	< 5.79 5.79 and above	59 41
22	Information seeking behaviour	Low High	< 22.39 22.39 and above	59 41
23	Knowledge	Low High	< 7.61 7.61 and above	61 39

A perusal of the Table 1 revealed that majority of the respondents were in the low category in the case of the variables namely education, Area under vegetables, Experience in vegetable cultivation, Family farming time (actual), FFT (ratio), Annual income, Educational status, Attitude towards scientific agricultural practices, Extension guidance, Social partaicipation, Economic motivation, Level of

aspiration, Achievement motivation, Cosmopoliteness, Information seeking behaviour and knowledge, while for the variable such as Farm size, FFT (potential, Innovativeness, Self reliance, Risk preference, Management orientation and Extension orientation, the distribution of respondents in the high category was fairly high.

Maximum bnumber of respondents in the high category was observed for the variable management orientation (61%) followed by Risk preference (60%), Farm size (59%), Innovativeness (59%), Self reliance (54%), Extension orientation (54%) and FFT potential (51%). Regarding the rest of the variables only less than 50 per cent of the respondents were found in the high category. Among them, maximum number of respondents (73%) was found in the low category in the variable social participation followed by Attitude towards scientific agriculture (68%), Extension guidance (66%), Level of aspiration (62%), Extension guidance (66%), Level of aspiration (62%), Knowledge (61%), Economic motivation (61%), Achievement motivation (60%), FFT ratio (60%), Area - vegetable (60%), FFT actual (59%), Annual income (57%), Educational status (56%), Experience in vegetable cultivation (55%), Education (53%), Extension guidance (56%), Cosmopoliteness (59%) and Information seeking behaviour (59%).

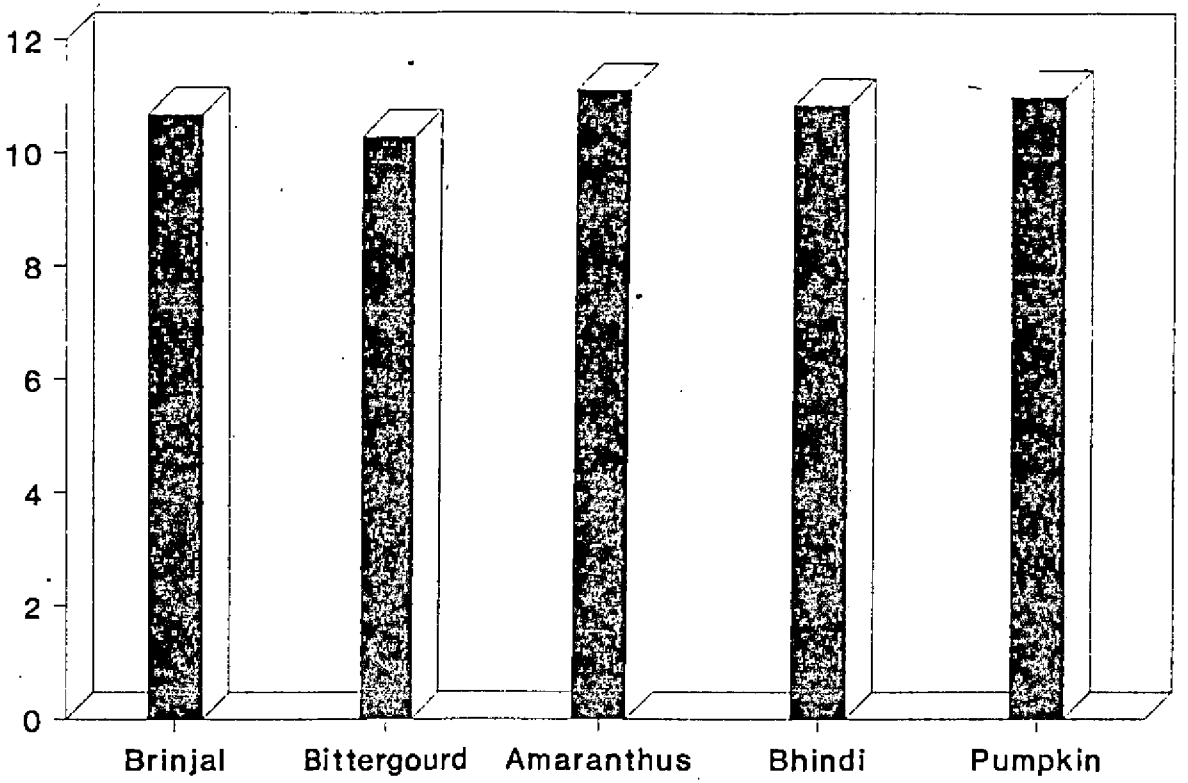
4.2 Perceived feasibility of Improved Vegetable Production Technologies (IVPT) by agricultural labourers in family farming

The feasibility scores of selected vegetable crops and improved production technologies as perceived by agricultural labourers are discussed below.

Table 2. Perceived feasibility of selected vegetable production technologies in family farming

Improved practices	Average perceived feasibility score of practices	Average feasibility score for the crop
BRINJAL		
1. Spacing of 60 cm x 75 cm	1.34	
2. Improved varieties	2.44	
3. Transplanting at 30-45 DAS	1.40	10.64
4. Split application of N & K at 75:40:25 NPK	2.94	
5. Plant protection measures	2.52	
BITTERGOURD		
1. Spacing	1.40	
2. Varieties	2.05	
3. Split application of 'N' at 75:25:25	2.92	10.27
4. After cultivation	1.55	
5. Plant protection measures	2.35	
AMARANTHUS		
1. Varieties	2.82	
2. Spacing at transplanting	1.57	
3. Manures and manuring	2.18	11.10
4. Foliar fertilization	2.96	
5. Plant protection measures	1.57	
BHINDI		
1. Varieties	2.57	
2. Spacing	1.80	
3. Seed soaking	1.86	10.84
4. Manure and manuring	2.21	
5. Plant protection measures	2.40	
PUMPKIN		
1. Improved varieties	2.92	
2. Spacing	1.67	
3. Manures and manuring	2.78	10.99
4. After care	1.90	
5. Plant protection mesures	1.72	

Fig.3. Perceived feasibility of selected crops in family farming



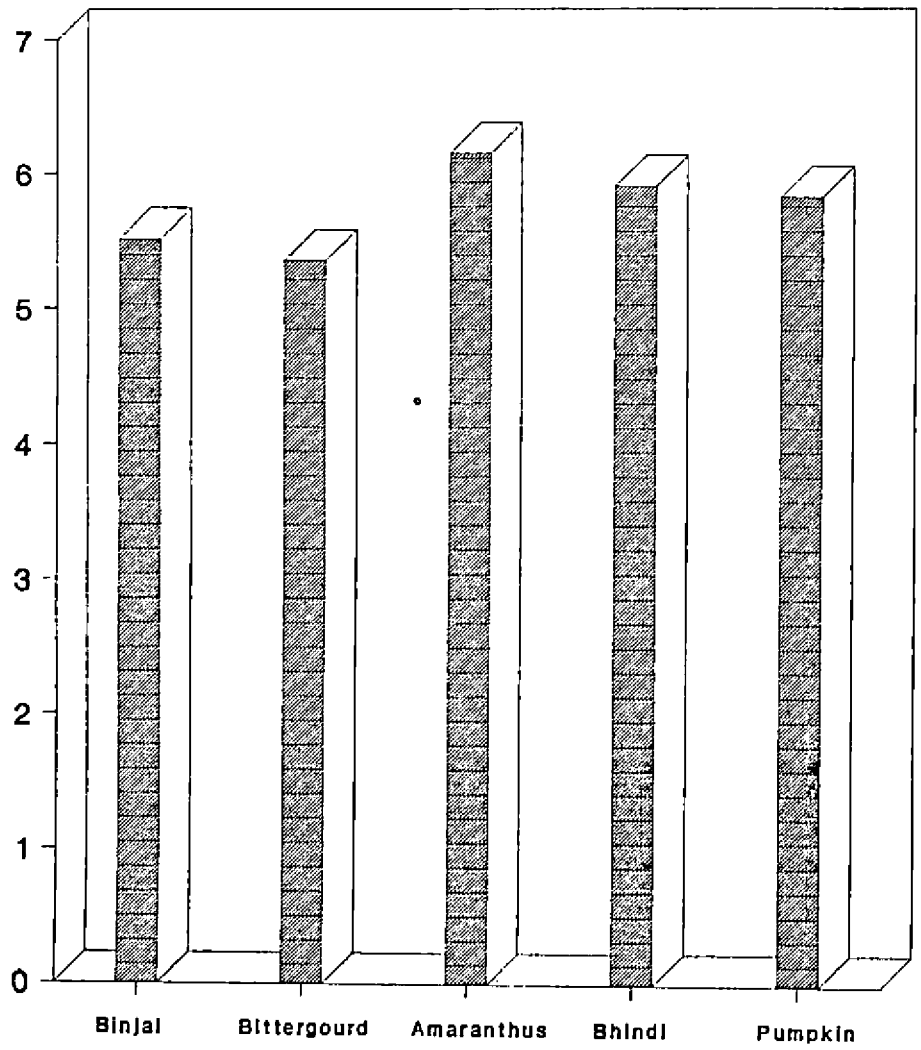
Among the crops selected, amaranthus received the highest feability score followed by pumpkin, ladies finger, brinjal and bittergourd respectively. Bittergourd and brinjal received feasibility perception scores below the average feasibility score of 10.76. Improved Production Technologies in bittergourd received the lowest score among the five crops selected.

With regard to the crop varieties, bittergourd varieties were less preferred (Feasibility score 2.05) while pumpkin varieties were the most preferred (2.82) followed by amaranthus, bhindi and brinjal respectively. Split application of N and K, split application of N and foliar application of fertilizer, were the most preferred practices in brinjal, bittergourd and amaranthus respectively. Improved varieties were most preferred among the selected practices in ladies finger and pumpkin cultivation. Among the individual practices, foliar fertilization in amaranthus received the highest feasibility perception score (2.96). This was attributed to the simplicity factor of the technology. The split application of fertilizers was perceived more feasible in family farming since it avoided large investment of money at a time. Moreover farmers perceived it as an effective technology since they got highest returns from the appropriateness of the recommendation tuned to the crop stages.

4.3 Extent of utilization of Improved Vegetable Production Technologies by agricultural labourers in family farming

The distribution of respondents on their extent of utilization is presented in Table 3. Based on the mean and standard deviation of utilization score, the respondents were grouped in to low, medium and high adopters. Farmers with

Fig.4. Utilization of IVPT in family farming by agricultural labourers



utilization score less than 4.14 and more than 7.36 were grouped as low and high adopters, respectively.

4.3.1 Distribution of respondents on the extent of utilization of Improved Vegetable Production Technologies in family farming

Table 3. Distribution of respondents on the extent utilization of Improved Vegetable Production Techniques in family farming

Category		Utilization score	Frequency (%)
Low	(X - SD)	Below 4.14	19
Medium	(X ± SD)	4.14 to 7.36	59
High	(X + SD)	Above 7.36	22
Total			100.00

X = 5.75
SD = 1.61

Medium adopters had utilization scores between 4.14 and 7.36. It has been explicit from the table that majority (59%) of the agricultural labourers were medium adopters. Only 19 per cent were low adopters, while high adopters accounted for 22 per cent.

4.3.2 Utilization of selected vegetable production technologies in family farming

The extent of utilization of each selected technology in family farming by agricultural labourers is discussed below:

Table 4. Utilization of IVPT in family farming by agricultural labourers

Practices	Mean utilization score (practices)	Utilization score for the crop
BRINJAL		
1. Spacing of 60 cm x 75 cm	0.562	
2. Improved varieties	1.22	
3. Transplanting at 30-45 DAS	1.06	
4. Split application of N & K at 75:40:25	1.40	
5. Plant protection measures	1.27	5.51
BITTERGOURD		
1. Spacing	0.85	
2. Varieties	1.15	
3. Split application of 'N' at 75:25:25	1.50	
4. After cultivation	0.63	
5. Plant protection measures	1.22	5.35
AMARANTHUS		
1. Varieties	1.24	
2. Spacing at Transplanting	0.96	
3. Manures and manuring	1.08	
4. Foliar fertilization	1.85	
5. Plant protection measures	1.02	6.15
BHINDI		
1. Improved varieties	1.40	
2. Spacing	0.93	
3. Seed soaking	0.72	
4. Manures and manuring	1.19	
5. Plant protection measures	1.67	5.91
PUMPKIN		
1. Improved varieties	1.59	
2. Spacing	0.73	
3. Manures and manuring	1.39	
4. After care	0.98	
5. Plant protection measures	1.14	5.83

From the table it is explicit that amaranthus production technologies received the highest utilization score of 6.15 followed by ladies finger, pumpkin, brinjal and bittergourd, respectively. Bittergourd received the lowest utilization and feasibility perception score. Utilization scores of brinjal and bittergourd are below the average utilization score of 5.75 when the scores of five crops are compared. Utilization index was highest fir the practice of foliar fertilization in amaranthus (1.85) followed by plant protection measures in bhindi (1.67) and improved varieties of pumpkin (1.59). Split application of fertilizers received the high utilization index in brinjal and bittergourd cultivation.

4.4 Influence of personal, socio-cultural and techno-economic factors of agricultural labourers on feasibility perceptions

The relationship of personal, socio-cultaural and techno-economic characteristics with the feasibility perception of agricultural labourers about the improved vegetable production technologies was established in this study first by correlation analysis and the findings are presented in Table 5.

Table 5. Results of the simple correlation analysis of feasibility perception with personal, socio-cultural and techno-economic factors

(n = 100)

Variable Number	Characters	Correlation coefficient (r)
1	2	3
X_1	Education	0.438**
X_2	Farm size	0.592**
X_3	Area under vegetable	0.389**
X_4	Experience in vegetable cultivation	0.184 NS

Contd.

Table 5. Continued

1	2	3
X_5	Family farming time - Actual	0.354**
X_6	Family farming time - Potential	0.228**
X_7	Family farming time - Ratio	0.436**
X_8	Annual income	0.249*
X_9	Family educational status	0.455**
X_{10}	Attitude towards scientific agriculture	0.509**
X_{11}	Innovativeness	0.476**
X_{12}	Self reliance	0.502**
X_{13}	Extension guidance	0.450**
X_{14}	Social participation	0.333**
X_{15}	Economic motivation	0.514**
X_{16}	Risk perference	0.428**
X_{17}	Level of aspiration	0.461**
X_{18}	Achievement motivation	0.486**
X_{19}	Management orientation	0.487**
X_{20}	Extension orientation	0.445**
X_{21}	Cosmopoliteness	0.416**
X_{22}	Information seeking behaviour	0.504**
X_{23}	Knowledge	0.574**

* Significant at 1% level
** Signfiicant at 5% level
NS - Non significant relation

A glimpse through the results of correlation analysis revealed that variables such as education, farm size, area under vegetables, Family Farming Time

in its Actual and Ratio dimensions, family educational status, self reliance, attitude towards scientific agriculture, innovativeness, extension guidance, social participation, economic motivation, risk preference, level of aspiration, achievement motivation, management orientation, extension orientation, cosmopoliteness, information seeking behaviour and knowledge were positively and significantly related to the perception of feasibility at one per cent level of significance, while family farming time - potential and annual income were significant at five per cent level. Experience in vegetable cultivation had positive but nonsignificant relationship with the feasibility perception of agricultural labourers.

4.4.1 Multiple Linear Regression Analysis (MLR)

In correlation analysis the research worker deals with the relationship of a dependant variable with an independant variable. But in practice, several independent variables affect the response (dependent variable). In the study of simultaneous variability of two or more causal factors on an effect (dependant variable), the researcher gets the relative contribition of each of the independant variables and a total predictability of the linear model to represent the relationship. The method of multiple linear regression was used for this purpose.

The findings of the multiple linear regression analysis presented in Table 6, revealed that the F value 4.34 obtained was significant indicating that are the variables together contributed significantly to the variation in feasibility perception of the respondent group. The coefficient of determination revealed that 56.80 per cent of the variation was explained by the twenty three variables.

Out of the 23 variables, only five variables namely farm size, innovativeness, management orientation, cosmopoliteness and information seeking behaviour were found to be significant.

Table 6. Results of the multiple linear regression analysis of the feasibility perception of IVPT and selected personal socio-cultural and techno-economic factors of agricultural labourers

Variable No.	Characters	Regression coefficient regression coefficient	Standard partial	t value	Probability
1	2	3	4	5	6
1	Education	2.9429	1.4266	0.093	0.926
2	Farm size	3.0996	6.4655	5.285**	0.000
3	Area under vegetables	-1.5479	-2.1258	-1.617	0.109
4	Experience in vegetable cultivation	-2.2929	-2.4227	-0.182	0.856
5	FFT - Actual	-2.0720	-3.4625	-0.105	0.916
6	FFT - Potential	1.3799	2.4842	0.098	0.922
7	FFT - Ratio	2.9735	1.9789	1.172	0.244
8	Annual income	-2.2333	-2.1704	-1.833	0.070
9	Family educational status	-1.5131	-2.6609	-1.319	0.190
10	Attitude towards scientific agriculture	-1.4357	-7.0790	-0.290	0.773
11	Innovativeness	1.9688	5.7524	2.680**	0.009
12	Self reliance	1.4415	6.3304	0.251	0.803
13	Extension guidance	2.5088	-1.1568	-0.553	0.582
14	Social participation	-3.5201	-1.5651	-0.133	0.895

Contd.

Table 6. Continued

1	2	3	4	5	6
15	Economic motivation	2.9696	1.9026	0.870	0.386
16	Risk preference	2.3582	8.2409	0.542	0.589
17	Level of aspiration	2.7009	2.0226	0.124	0.902
18	Achievement motivation	8.3701	1.9628	0.832	0.407
19	Management orientation	-4.7400	-6.6090	-2.110*	0.037
20	Extension orientation	-3.4971	-5.8464	-0.259	0.796
21	Cosmopoliteness	-5.7682	-3.6071	-2.016*	0.047
22	Information seeking behaviour	1.6927	4.9023	2.0748*	0.041
23	Knowledge	2.8605	2.8308	1.741	0.085
	Interest	= 7.59			
	R^2	= 0.568			
	F	= 4.34**			

**Significant at 1% level of significance

From the table it could bededuced that out of the variables contributing significantly unit increase in farm size caused 3.0996 unit increase in feasibility perception *Ceteris paribus*. Similarly unit increase of innovativeness and information seeking behaviour could generate increases of 1.9688 and 1.6927 units respectively in the feasibility perception *Ceteris paribus*. However, unit increases the variables managed in orientation and cosmopoliteness contributed increases of 4.7400 and 5.7682 units respectively in the reverse direction in the dependent structure. Thus it can be assumed that farm size predominates in contributing to perception of feasibility of technologies followed by innovativeness and information seeking behaviour.

4.4.2 Step down regression analysis

Though the multiple linear regression analysis gave the joint influence of all the selected independent variabales on the feasibility perception of agricultural labourers in family farming, it is always better to have a simpler model in which there arelesser number of predictors in explaining the relationship. So to get the joint influence of the best subject of a lesser number of predictors on feasibility perception of agricultural labourers, step down regression analysis was done using the 22 independent variables.

As a final step, six variables namely farm size, annual income, innovativeness, economicmotivation, management orientation and knowledge were obtained after exclusion of the variables with high probability values. The coefficient of determination (R^2) was found to be 0.507 which indicated that 50.7 per cent variation in the feasibility perception could be explained by these six variables. Results of step down regression are presented in the Table 7.

4.4.3 Path analysis

The single correlation coefficients indicated the degree and nature of relationships of each of the personal, socio-cultural and techno-economic characteristics with the feasibility perception ignoring the possible influence of other independent variables on the dependents variable. It could be of interest to split the amount of relationship that a particular characteristic had with the feasibility perception into (a) its direct influence, (b) possible indirect influence, on feasibility perception through other personal, socio-cultural and techno-economic characteristics.

Table 7. Results of step down regression analysis of feasibility perception with their personal, socio-cultural and techno-economic characters

Step No.	Variables for regression	Multiple regression coefficients (R)	R^2	F value
1	X_2, X_3, X_4, X_5, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}, X_{19}, X_{20}, X_{21}, X_{22}, X_{23} and X_{24}	0.7536	0.5679	4.34**
2	Down X_2	0.7536	0.5679	4.60**
3	Down X_6	0.7535	0.5678	4.88**
4	Down X_7	0.7535	0.5678	5.19**
5	Down X_{18}	0.7535	0.5677	5.53**
6	Down X_{15}	0.7534	0.5676	5.91**
7	Down X_5	0.7532	0.5673	5.32**
8	Down X_{13}	0.7530	0.5670	6.79**
9	Down X_{21}	0.7528	0.5667	7.32**
10	Down X_{11}	0.7525	0.5662	7.92**
11	Down X_{14}	0.7512	0.5643	8.57**
12	Down X_{17}	0.7498	0.5622	9.31**
13	Down X_{19}	0.7486	0.5603	10.20**
14	Down X_8	0.7413	0.5496	10.86**
15	Down X_4	0.7342	0.5390	11.69**
16	Down X_{10}	0.7263	0.5274	12.70**
17	Down X_{23}	0.7177	0.5150	13.96**
18	Down X_{22}	0.7125	0.5075	15.98**
Remaining variables X_3, X_9, X_{12}, X_{16}, X_{20} and X_{24}				

**Significant at 1% level

Since this information was not available in the earlier analysis, the data were subjected to the multi-variate path analysis in order to get the desired information. This path analysis would enable us to measure the direct and indirect effects of each of the selected independent variables on the feasibility perception and the results are presented in Table 8.

Table 8. Results of the path analysis of selected independant variables with the feasibility perception of agricultural labourers

(n = 100)

Variable No.	Characteristic	Direct effect		Total indrect effect		Largest indirect effect	
		Effect	Rank	Effect	Rank	Effect	Through variable No.
4	Farm size	0.5276	I	0.0648	VI	0.1764	25
10	Annual income	-0.1923	VI	0.4416	II	0.2721	4
13	Innovativeness	0.2909	V	0.1856	V	0.2492	25
14	Economic motivation	0.2911	IV	0.2227	IV	0.2462	25
21	Management orientation	-0.4882	II	0.9749	I	0.2772	4
25	Knowledge	0.3352	III	0.2387	III	0.2776	4
Residual effect		= 0.4924					

A bird's eye view of the results presented in Table 8 showed that farm size had the highest direct effect on the feability perception of IVPT in family farming by agricultural labourers, followed by knowledge on IVPT. Economic

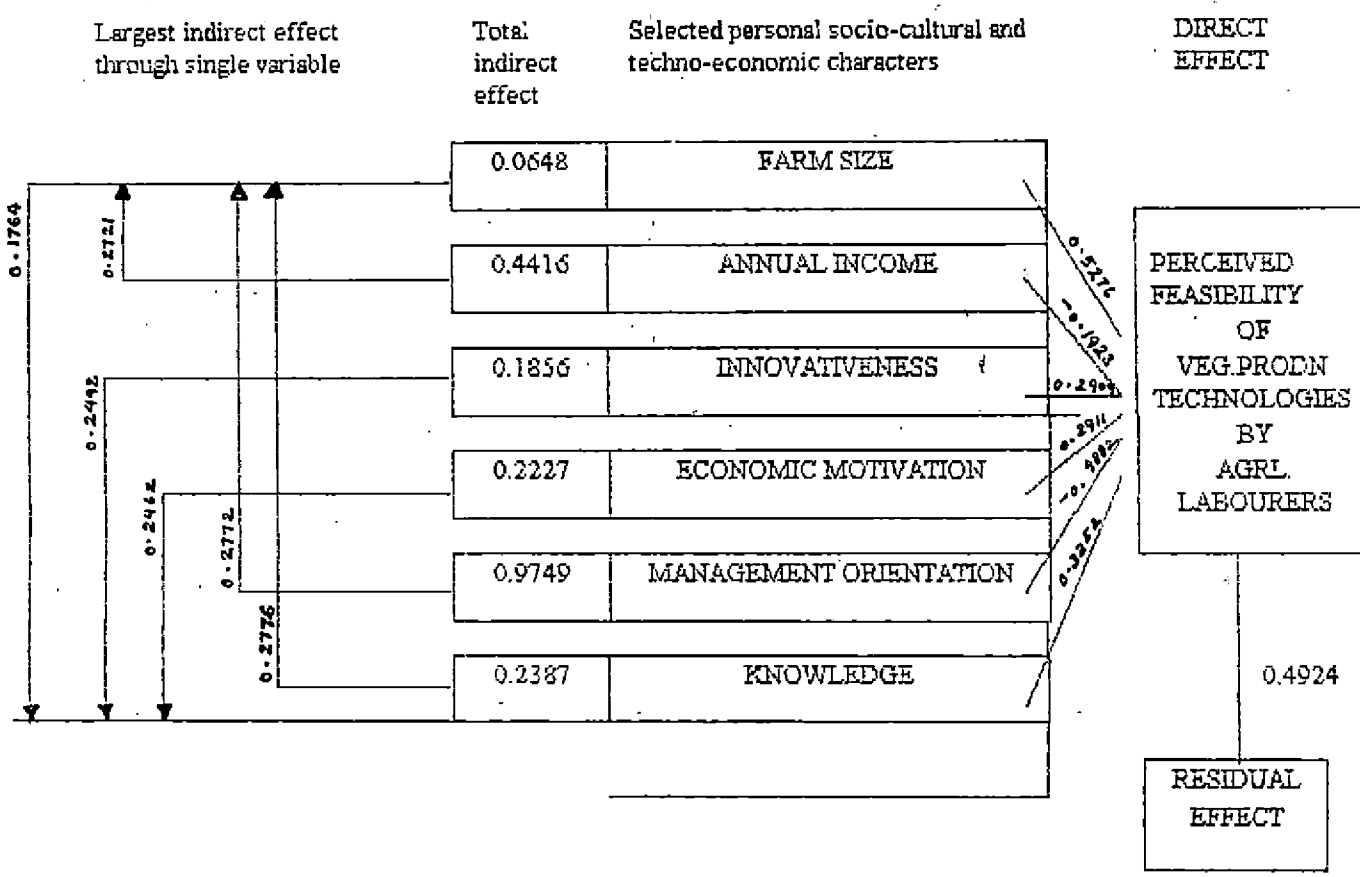


Fig - 5 Path diagram showing the direct and indirect effects of the selected personal, socio - cultural and techno - economic characteristics on Feasibility perception.

motivation and innovativeness were also found to have substantial direct effect. Annual income and management orientation were found to have negative direct effect on the dependant variable. Variables such as farm size, innovativeness and economic motivation exerted maximum indirect effects through the variable knowledge. In the case of variables annual income, management orientation and knowledge maximum indirect effects were found to be through the variable farm size. Thus farm size and knowledge cana be considered as crucial variables influencing the perception of feasibility of technologies by agricultural labourers.

Based on the correlation analysis, multilinear and stepdown regression analyses and path analysis, the relationship of these independent variable with the perception of feasibility of technologies has been analysed and discussed below.

Education was found postively and significantly correlated with perception of agricultural labourers. Perception is a more complex process by which people select, organise and interpret sensory stimulus into meaningful and coherent picture of the work (Berelson and Steiner, 1964). Higher the level of education, better would be the degree of perception. Education widens the sphere of social perspective and helps the individual in proper interpretation of external stimuli. Even when induced flow of information ceases from the technology generating system to the consumption system, education enables individuals to tap information at his own capacity and assists in rational perception. This finding is in conformity with Sundaram (986), Balan (1987) and Latha (1990). But in subsequent multiple linear

regression analysis and step down regression analysis this failed to emerge as important.

Farm size was positively and significantly related with perception of agricultural labourers. The size of holding may be an indicator of the levelof assets and a higher level of assets implies a willingness for adopting new ideas by the farmers which in turn is reflected in their better perception of the feasibility of innovations. Farm size contributed significantly to the perception of feasibility and this produced the largest direct effect on feasibility perception and its most indirect effect routed through the variable knowledge on improved technologies. High land holiding status is reflected in better risk bearing capacity. An agricultural labourer with more risk bearing capacity will have more of awareness, knowledge and technological adoption and hence this finding. This finding corroborates with that reported by Seema (1986) and Balan (1987).

Positive and significant relationship was observed between area under vegetables and feasibility perception though it did not contribute significantly to the variations in the feasibility perception in subsequent analysis. Total Farm size becomes significant in feasibility perception of farm technologies in general, but area under the specific crop determines the utilization of crop specific technologies and thus it affeects feasibility perception. Damodaran (1994) also reported a similar relationship.

The results revealed a non-significant positive relationship between experience in vegetable cultivation and feasibility perception. A perceptual accuracy depends upon an individual's post experience in each area in which the stimulated mental activity functions. With varying past experiences, two persons have the same perceptual capacity and hence this finding in line with those reported by Sobhana (1982), Reddy (1987) and Sunilkumar (1993).

Family farming time, in its three dimensions of actual, potential and Ratio of actual to the potential was found with significant and positive relationship with perception of feasibility of technologies. More utilization of leisure time at disposal of the family in vegetable family farming implies a shift towards scientific farming incorporating improved farm inputs which demand more individual attention and time. This may orient his attention to feasible technologies and influence the symbolic adoption behaviour. However this variable failed to contribute significantly in subsequent analysis.

There was significant and positive relationship between annual income and feasibility perception of agricultural labourers. Annual income was found to have its largest indirect effect through the variable farm size in the multivariate path analysis. Agricultural labourers with higher farm size would have more risk bearing ability owing to higher income. Since modern farm technologies involves risks in adoption, compared to low income group, high income group would have better

perception of feasibility. This finding was in line with Balan (1987) and Latha (1990).

The overall educational status of the family is likely to affect the comprehension of the members absout the utility and feasibility of vegetable production technologies under their specific farm and home situation. Higher educational status naturally results in developing the cognitive domain of attitude towards the technology and hence better perception. This substantiates the positive and significant relationship between family educational status and perception of feasibility as reported by Sundaran (1986), Latha (1990) and Fathimabi (1993).

Attitude towards scientific agriculture was found positively and significantly related to the feasibility perception, though it failed to contribute significantly in subsequent regression analysis. The theory of attitude behaviour consistency (Fishbein and Raven, 1962; Mc Guire, 1969) indicates that the development of vavourable or infavourable attitude towards an object or situation will be dependent on the benefits associated with the objeect or situation. Attributes of the technology, thus, determine agricultural labourers attitude and cause selectivity in perception. Agricultural labourers, who might have adjudged the pros and cons. of scientific agricultural practices and with a favourable attitude towards them would have better perception of their feasibility and hence this finding. This was in line with the observations of Latha (1990) and Alex (1994).

The feasibility perception of technologies by agricultural labourers was found positively and significantly related to the variable innovativeness, with significant contribution in the dependent variable in with linear regression analysis. In path analysis, this was found with positive direct effect to feasibility perception, with its largest indirect effect being routed through the variable knowledge on vegetable technologies. Bemis (1972) theory of self perception stated that people come to know their attitudes, emotions and other internal states partially by inferring them from their over behaviour and the context in which this behaviour occurs. An important cause for innovativeness is an underlying willingness to change and also to try new ideas and hence agricultural labourers with more innovativeness will have a vigorous sense of initiation from inside to know more about the technology. The more knowledge of technology attributes the better will be perception of feasibility. This finding is in line with those of Latha (1990) and Fathimabi (1993).

Self reliance was found to have positive and significant relationship with feasibility perception. According to Ariyaratna (1979), self reliance is more than merely financial and it includes the possibility for dynamic adjustment with a changing system and as a value basis pertaining to the attainment of broader goals that an individual has set for himself. Hence an agricultural labour having high self reliance will have a natural inclination to orient himself to perceive the feasibility of vegetable production technologies to meet the changing needs of the family. Damodaran (1994) also observed similarly.

The positive and significant relationship between the extension guidance and feasibility perception is not beyond logical reasoning. The relative accuracy of perception depends upon the intensity of the attention process. The degree of guidance actually received by agricultural labourers directly from various extension personnel would be a determining factor in the perception of feasibility, and this has a reinforcing effect on their cognitions. This result is in line with the findings of Desai (1981).

Social participation is quite important in determining the individual cognition, where in objects, ssituations and people are evaluated based on collective thinking. The social interaction model of diffusion of innovation (Havelock, 1969) suggests that most people wait until they discuss the innovation with others who already have experience with it before adopting the innovations. More over, greater involvement of agricultural labourers in various organisations will provide them with opportunity for better exposure to interpersonal channels of communication and innovative ideas and hence better perception of the feasibility of technologies, as reported by Sundaram (1980), Latha (1990) and Fathimabi (1993).

Higher level of economic motivation creates a desire in the agricultural labourers for better performance which motivates them to seek out new technologies in order to maximise their profit. They will have more perception about the potentialities of technological attributes for the obvious reason that they undergo a process of change only when there is a strong economic urge. This explained the

positive and significant relationship between economic motivation and perception of feasibility of technologies. In path analysis this exerted maximum indirect effect through knowledge indicating that high economic motivation would cause an inclination in agricultural labourers toward symbolic adoption of EVPT, restraianed by multiplicity of constraints. Consequently, his cognitive horizon is widened and thus a better perception of technological feasibility. Fathimabi (1993) and Babu (1995) also observed a similar association.

Risk preference established significant positive relationship with the feasibility perception but failed to emerge significant in subsequent multilinear regression analysis and path analysis. Agricultural labourers assuming greater degree of risk would evince more interest in search of details of technology. A sound apprehension of the technological attribute enhances clarity in perception and hence the finding. Studies by Sundaram (1986) and Pandey (1990) confirmed this finding.

Level of aspiration was found positively related with the feasibility perception. Agricultural labourers occupy the lower social stratum and studies have revealed their low level of aspiration. Labourers who are optimistic in their life and confident about their future will be striving for better performance in life. This attitude will be reflected in all of their activities, as supported by the theory of self fulfilling prophecy (Devito, 1985). Thus a higher level of aspiration acts as a precursor for betterment of family farming they are engaged in and this invariably leads to objective perception of technological attributes. Fathimabi (1993) also reported a result in confirmity with this finding.

The perception of feasibility of technologies was found positively related with the achievement motivation of agricultural labourers. As Kahl (1965) revealed, how the person defines a situation affects the expression of achievement motivation in behaviour and the values and goals that the person perceives in the situation are important. Higher levels of achievement motivation creates a desire for better performance in agricultural labourers which motivate them to seek out information on IVPI and hence influence the perception of itsfeasibility in family farming. However, this failed to emerge as significant in subsequent analyses. Studies by Anantharaman (1991), Sunilkumar (1993), Alex (1994) and Damodaran (1994) confirmed this finding.

The results indicated a positive and significant relationship between management orientation and feasibility perception. A higher level of management orientation implies a better involvement in activities related to planning, production and marketing aspects of farming. Harding (1982) indicated that farm management process is essentially one of the decision making, incorporating the five stages of search and choice. The search involved an identification and evaluation of alternative production strategies, while the choice required the strategy selection. Both these necessitate a sound perception of the feasibility of technologies and hence the finding. In subsequent regression analyses, this contributed significantly and had largest indirect effect through the variable farm size, indicating that management orientation and farm size are interrelated. Syamala (1988) and Damodaran (1994) also observed similar relationship.

Extension orientation was found to have significant positive relationship with feasibility perception. The contact of farmers with extension functionaries and their participation in various extension activities will naturally enhance their curiosity to know more about IVPT and thus better perception. French and Raven (1959) while delineating the types of social powers identified expert power as a form of potential influence over another person by virtue of special knowledge that an individual possesses. With agricultural labourers attaching more expert power to the extension functionaries, behaviour relevant to the area of expertise of different extension functionaries are generated which in turn enhances the thirst for innovation and perception of feasibility. Seema (1986), Sundaram (1986), Fathimabi (1993) and Arulraj and Ulagalandan (1995) also substantiated this finding.

Another variable having significant positive relationship with the feasibility perception was cosmopoliteness, which emerged as important in multilinear regression analysis also. More cosmopoliteness leads to more external orientation and a cosmopolite individual is expected to top most of information that trickles down to the sphere of rural social system. They are expected to have good rapport with extension functionaries than locaalise agricultural labourers and have better perception of feasibility of technologies. Studies by Fathimabi (1993) and Menon (1993) confirmed this finding.

Information seeking behaviour was also found positively and significantly related to perception of feasibility. In multilinear regression analysis

also this emerged as significant contributor. Seeking information from different sources and getting more cognition about an object, the outlook of the individual gets changed which is reflected in his perception towards the object. As outlines in the theory of stability and change in behaviour (Secord and Backman, 1961) individuals attain congruency in perceptual - cognitive state in relation with another person when the other's behaviour contains implications congruent with elements of his own behaviour and self concept. This probably explains how information seeking behaviour and perception are related. Balan (1987), Latha (1990) and Babu (1995) also revealed positive relationships.

The results explicated that knowledge was significantly and positively related to the feasibility perception. Knowledge on IVPT provide the agricultural labourers diversity of alternatives and widens his mental horizon. Knowledge promotes rationality which is the ability of a person to be logical in his decision and reaction to any situation. More the knowledge on IVPT, the better will be his ability to perceive vividly. In path analysis this exerted largest indirect effect through the variable farm size making it explicit that larger farm size orient an individual better to acquiring relevant knowledge, in addition to contributing to his risk bearing capacity. Studies by Seema (1986), Sundaram (1986) and Alex (1994) confirmed the relationship.

4.5 Influence of personal, socio-cultural and techno-economic factors of agricultural labourers on the utilization of improved vegetable production technologies (IVPT)

The relationship of personal, socio-cultural and techno-economic characteristics with the utilization of IVPT by agricultural labourers in family farming was established in this study first by simple correlation analysis and the findings are presented in Table 9.

Table 9. Results of single correlation analysis of extent of utilization of IVPT by agricultural labourers with the personal, socio-cultural and techno-economic characteristics

(n = 100)

Variable No.	Characteristics	Correlation coefficients
1	2	3
X_1	Education	0.670**
X_2	Farm size	0.511**
X_3	Area under vegetables	0.703**
X_4	Experience in vegetable cultivation	0.063^{NS}
X_5	Family Farming Time - Actual	0.547**
X_6	Family Farming Time - Potential	0.340**
X_7	Family Farming Time - Ratio	0.638**
X_8	Annual income	0.263**
X_9	Family educational status	0.597**
X_{10}	Attitude towards scientific agriculture	0.677**

Contd.

Table 9. Continued

1	2	3
X_{11}	Innovativeness	0.547**
X_{12}	Self reliance	0.705**
X_{13}	Extension guidance	0.624**
X_{14}	Social participation	0.612**
X_{15}	Economic motivation	0.639**
X_{16}	Risk preference	0.569**
X_{17}	Level of aspiration	0.677**
X_{18}	Achievement motivation	0.693**
X_{19}	Management orientation	0.689**
X_{20}	Extension orientation	0.737**
X_{21}	Cosmopoliteness	0.669**
X_{22}	Information seeking behaviour	0.748**
X_{23}	Knowledge	0.745**

** Significant at 1% level of significance
NS - Nonsignificant

It was found out that out of twenty three independent variables included in the study, the variables education, farm size, area under vegetabales, family farming time (FFT) - Actual, FFT - Potential, FFT - Ratio, annual income, family educational status, attitude towards scientific agriculture, innovativeness, self reliance, extension guidance, social participation, economic motivation, risk

preference, level of aspiration, achievement motivation, management orientation, extension orientation, cosmopoliteness, information seeking behaviour and knowledge were positively and significantly related with the utilization of IVPT by agricultural labourers at 0.01 level of significance. Only one variable, namely, experience in vegetable cultivation did not have any significant relationship with the dependent variable.

4.5.2 Multiple Linear Regression Analysis (MLR)

Using all the twenty three variables, MLR was done in order to get the relative contribution of each of the independent variable on the dependent variable. The findings are presented in Table 10.

It was revealed that the F-value (13.82) obtained was significant indicating that all the variables together contributed significantly to the variations in the extent of utilization of the respondent group. The coefficient of determination revealed that 80.7 per cent of the variation in the extent of utilization was explained by these 23 variables.

Out of the 23 variables, only seven variable namely Area under vegetables, Family Farming Time (Actual), Attitude towards scientific agriculture, Social participation, Management orientation, Information seeking behaviour and knowledge were found to be significant.

Table 10. Results of Multiple Linear Regression Analysis of Extent of utilization of IVPT with their personal, socio-cultural and techno-economic characteristics

(n = 100)

Variable	Characteristic	Regression coefficient regression coefficient	Standard partial	t value	Probability
1	2	3	4	5	6
X_1	Education	2.0118	1.6555	1.62	0.108
X_2	Farm size	1.6659	5.8985	0.721	0.172
X_3	Area under vegetables	1.0997	2.5636	2.917**	0.004
X_4	Experience in vegetable cultivation	-8.6383	1.5493	-1.739	0.085
X_5	FFT - Actual	1.6003	4.5394	2.064**	0.042
X_6	FFT - Potential	-6.7307	-2.0569	-1.212	0.228
X_7	FFT - Ratio	3.8667	4.3681	0.387	0.699
X_8	Annual income	-3.7337	-6.1594	-0.778	0.438
X_9	Family educational	-1.5555	-4.6435	-0.344	0.731
X_{10}	Attitude towards scientific agriculture	-5.2860	-4.4243	-2.708**	0.008
X_{11}	Innovativeness	1.5220	7.5985	0.526	0.600
X_{12}	Self reliance	2.9712	2.2148	1.312	0.192
X_{13}	Extension guidance	3.6737	2.8754	0.206	0.838
x_{14}	Social participation	3.2476	2.4511	3.110**	0.002

Contd.

Table 10. Continued

1	2	3	4	5	6
X_{15}	Economic motivation	4.7226	5.1360	0.351	0.726
X_{16}	Risk preference	2.0274	1.2026	1.183	0.240
X_{17}	Level of aspiration	-2.7388	-3.4815	-0.319	0.757
X_{18}	Achievement motivation	-3.1673	-1.2608	-0.800	0.426
X_{19}	Management orientation	-2.9902	-7.1413	-3.381**	0.007
X_{20}	Extension orientation	1.0544	2.9923	1.982	0.050
X_{21}	Cosmopoliteness	-9.9629	-1.0565	-0.088	0.930
X_{22}	Information seeking behaviour	8.0171	3.9421	2.495*	0.014
X_{23}	Knowledge	2.0822	3.4978	3.219**	0.002

Intercept = 2.8069
R^2 = 80.7
F = 13.82
**Significant at 1% level
* Significant at 5% level

It is explicit from the results that out of the independent variables unit increase in information seeking behaviour contributed an increase of 8.0171 units in the utilization behaviour *Ceteris paribus*. Similarly area under vegetables (1.0997), Family Farming Time - Actual (1.6003), social participation (3.2476) and knowledge (2.0822) contributed significantly to utilization of improved technologies

in vegetable family farming. However, attitude towards scientific agricultural practices and management orientation contributed to increases of 5.2860 and 2.9502 units respectively in adoption behaviour but in the reverse direction. Thus it can be deduced that information seeking behaviour predominates in contributing to the utilization behaviour of agricultural labourers engaged in family farming, followed by social participation, knowledge, Family Farming Time - Actual and area under vegetables respecetively.

4.5.3 Step down regression analysis

The step down regression analysis was employed to identify the best set of variables that could predict the dependant variables. The results of step down regression analysis are presented in Table 11.

It was found out that out of the total variation of 80.70 per cent by all the independent variable, 77.28 per cent was contributed by nine variables namely, Area under vegetable, Family Farming Time - Actual, Experience, Attitude towards scientific agriculture, Social participation, Management orientation, Extension orientation, Information seeking behaviour and knowledge.

Table 11. Results of the step down regression analysis of the extent of utilization of IVPT with personal, socio-cultural and techno-economic characteristics of agricultural labourers

Step No.	Variables for regression	Multiple regression coefficient (R)	R^2	F value
1	X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}, X_{19}, X_{20}, X_{21}, X_{22}, X_{23} and X_{24}	0.8983	0.8070	13.82**
2	Down X_{22}	0.8983	0.8070	14.63**
3	Down X_{14}	0.8983	0.8069	15.52**
4	Down X_{18}	0.8981	0.8067	16.48**
5	Down X_{10}	0.8980	0.8064	17.53**
6	Down X_8	0.8978	0.8060	18.69**
7	Down X_{16}	0.8975	0.8056	19.98**
8	Down X_{12}	0.89973	0.8051	21.42**
9	Down X_3	0.8967	0.8040	22.98**
10	Down X_9	0.8963	0.8033	24.30**
11	Down X_{19}	0.8947	0.8005	26.54**
12	Down X_{17}	0.8919	0.7955	28.20**
13	Down X_7	0.8891	0.7905	30.19**
14	Down X_2	0.8842	0.7818	31.88**
15	Down X_{13}	0.8791	0.7728	34.01**
(Remaining variables X_4, X_5, X_6, X_{11}, X_{15}, X_{20}, X_{21}, X_{23} and X_{24})				

** Significant at 1% level

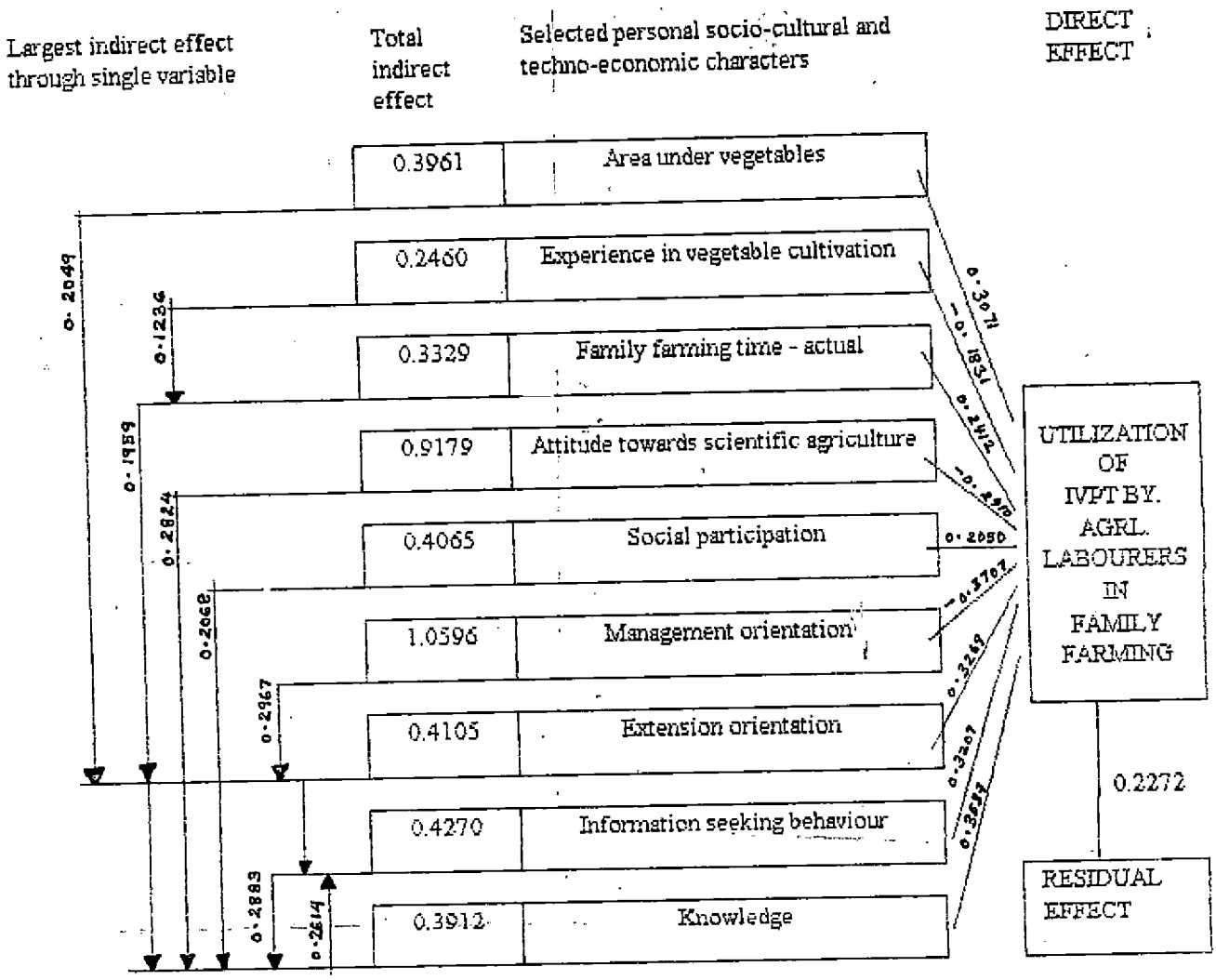


Fig. 6 Path diagram showing the direct and indirect effects of the selected personal, socio - cultural and techno - economic characteristics on utilization of IVPT by agricultural labourers.

4.5.4 Path analysis

Path analysis was carried out in order to measure the direct and indirect effects of each personal, socio-cultural and techno-economic characters on the dependent variable and the results are presented in Table 12.

Table 12. Results of path analysis of selected independent variables with the extent of utilization of IVPT

(n = 100)

Variable No.	Characteristics	Direct effect		Total indirect effect		Longest indirect effect	
		Effect	Rank	Effect	Rank	Effect	Through variable No
5	Area under vegetable	0.3071	V	0.3961	VI	0.2049	22
6	Experience in vegetable	-0.1831	IX	0.2460	IX	0.1236	7
7	Family farming time -	0.2142	VII	0.3329	VIII	0.1959	25
12	Attitude towards scientific agriculture	-0.2410	VI	0.9179	II	0.2824	25
16	Social paticipation	0.2050	VIII	0.4065	V	0.2068	25
21	Management orientation	-0.3707	I	1.0596	I	0.2967	22
22	Extension orientation	0.3269	III	0.4105	IV	0.2764	24
24	Information seeking behaviour	0.3207	IV	0.4270	III	0.2883	25
25	Knowledge	0.3537	II	0.3912	VII	0.2614	24

Residual effect = 0.2272

The results of path analysis indicated that knowledge on improved vegetable production technologies had the highest direct effect on the extent of utilization of IVPT by agricultural labourers in family farming; followed by extension orientation. Information seeking behaviour and Area under vegetables are the other two variables with substantial direct effect.

Of the remaining variables, family farming time - Actual and social participation had positive direect effects on the dependent variable. VAriables such as experience in vegetable cultivation, Attitude towards scientific agriculture and management orientation had vegetative direct effect on the dependent variable.

It can be noticed that variables like Information seeking behaviour, family farming time - Actual, Social participation and attitude towards scientific agriculture exerted their largest indirect effects through the variable knowledge, while that of variables like area under vegetables and management orientation was through the variable extension orientation. The largest indirect effect of the independent variable experience in vegetable cultivation was through the variable Family Farming Time - Actual and that of Extension orientation and knowledge was through the variable information seeking behaviour.

On the basis of the results in correlation analysis, multileaner regression and step down regression analyses and path analysis, the relationship of each independent variable with the utilization of improved vegetable production technologies and its observed indirect influences have been discussed below.

Education was found positively and significantly related to the utilization behaviour of agricultural labourers. Education plays an enabler role in enhancing the knowledge level and reorienting atitudes of people towards the technology. Rationality in one's decision making regarding acceptance or rejection of an innovation is a function of one's educational level and for adoption of any innovation, decision making is a key component. However, education did not emerge as significant in subsequent statistical analyses. Sulaiman (1989), Satheesh (1990) and Rajendran (1992) also observed similar results.

Farm size established a positive and significant relation with utilization of IVPT but failed to emerge as significant in further regression and path analyses. Agricultural labourers with higher land holding status usually have better socio-economic status and this enable them to endure higher risk. Better financial resources enable an individual to invest for different specialised farm operations. Since the risk bearing capacity and financial stability are closely related with higher land holding status, it appears to be an important factor associated with adoption. This finding is in line with that of Swaminathan (1986), Reddy (1987) and Satheesh (1990).

A higher gross area under vegetables reflects higher dependence of the agricultural labourers on vegetable cultivation. Modern technologies are risk involving and only labourers with more area under the crop can afford to utilize it in family farming. Area under vegetables emerged as significant variable in correlation

analysis, multilinear and step down regression analyses. In path analysis this had largest indirect effect through extension orientation. Higher area under the crop opens more alternatives for an individual to opt for and he would have a desire for more knowledge about IVPT and in variably a better orientation towards extension functionaries, who constitute the knowledge disseminating system. This facilitate more utilization of innovations in family farming. Sulaiman (1989), Satheesh (1990), Gopala (1991) and Nanchinal *et al.* (1991) also reported similar association.

It was interesting to note that experience was having only a non significant positive relationship with the utilization of IVPT by agricultural labourers. Unlike in the earlier farming situations, accessibility to farm innovations and consequent symbolic adoption has improved considerably owing to rapid explosion of the communication system. It cannot be deduced that labourers with more experience have more grasp of technology. In path analysis, this was found exerting its largest indirect influence through the variable Family Farming Time - Actual, indicating that its positive effect is manifested through the actual time spent on family farming. This contradicted the findings of Bonny (1991) and Susamma (1994).

The availability of leisure time for family farming was found positively related to the extent of utilization as anticipated earlier. Out of the three dimensions of the variable family farming time viz. Actual, Potential and Ratio dimensions, only the Actual dimension emerged significant in subsequent analyses. In path

analysis, it had largest indirect effect through the variable knowledge making it explicit that one who actually utilized most of potential component of time at his disposal for family farming had increased familiarity with technology and his quest for more knowledge on it. Andrews (1994) and Susamma (1994) observed similarly.

Though annual income established a positive and significant relationship with utilization of IVPT, it failed to emerge significant in subsequent statistical analyses. Utilization of improved technologies in family farming involves risk and only labourers with sufficient farm income can afford adopting them. High level of income enhances the socio-economic status of any individual, enhances his cosmopoliteness and his contacts with chage agents since they benefit always from the "wind fall effect" in diffusion of technologies. Aziz (1988) and Babu (1995) also reported positive relationship.

Family educational status could establish a significant positive relationship with utilisation of IVPT. Since family farming is based on family as a whole rather than individual characteristics, those of the family exert considerable influence. But this didn't contribute significantly in further statistical analyses. This finding was in line with that of Aggarwal and Arora (1989).

Atitude towards scientific agricultural practices was found positively and significantly related to utilization of IVPT. Altitude is a result of the respondent's perception, knowledge and experience with IVPT. Attitude being a component of behaviour, a favourable attitude will lead to a favourable behaviour, unless the

behaviour is restricted by other external or internal factors. In path analysis, this had the largest indirect effect through the variable knowledge, which indicates that an agricultural labourer with better attitude towards modern crop production practices will have a quest for more relevant knowledge in order to gather consonance for his cognitions regardint the technology. Singh *et al.* (1992), Sulaiman and Prasad (1993) and Susamma (1994) also observed similar relationship.

While theorising the typology of innovative farmers Rogers and Shoemaker (1971) postulated that the inquisitiveness and curiosity arising out of a farmer's search for efficient and latest farm technologies leads him to gather enough knowledge on improved practices. Lerner (1981) had indicated that a vigorous sense of initiation from within one's self to activate new ways could be referred to as innovativeness and this manifests in all behavioural aspects of an individual and hence the positive relationship between innovativeness and utilization of technologies observed in correlation analysis. Similar results were reported by Anithakumari (1987), Krishnamurthy (1991) and Reddy (1991).

Self reliance though found positively and significantly related to the utilization of IVPT, faialed to contribute significantly to adoption behaviour of agricultural labourers in multilinear and step down regression analyses. Coleman (1971) stated that self structure is one of the major determinants for developing assumptions and attitude about anything. When people are highly self reliant, they would be more oriented to increasing their potentialities and this may influence their

adoptive behaviour also. Findings of Prasad (1983), Sreekumar (1985) and Porchezhian (1992) were in line with the above.

In the correlation analysis, a positive and significant relation was observed between extension guidance and the utilization of IVPT indicating that the degree of guidance received from the change agents has a bearing on the adoption of these practice by agricultural labourers. Extension guidance is momentous in facilitating access of agricultural labourers to innovations by familiarising them varied technological attributes and also in achieving consistency in adoptive behaviour by reducing cognitive dissonance. Rameshbabu (1987), Ajaykumar (1989) and Rajendran (1992) reported similar results.

Social participation established a positive and significant relationship and contributed significantly to the variations in utilization of IVPT by agricultural labourers. In path analysis this exerted maximum indirect effect through the variable knowledge. Greater degree of social participation widens the sphere of knowledge of agricultural labourers and enhances familiarisation. More knowledge genetrates multiplicity of alternatives in the process of decision making. The Social Interaction model of diffusion of innovation (Havelock, 1969) suggests that most people wait until they discuss the innovation with others who already have experience with it before adopting the innovations by themselves. For agricultural labourers with meagre land under possession and low access to the production inputs, utilization of improved technologies in family farming involves risk. By the phenomenon of

"risky shit" decisions in groups are more risky and less cautions than decisions made by individuals before discussion (Stoner, 1961). Diffusion of responsibility reduces fear of failure and agricultural labourers will be better oriented towards adoption of technologies and hence this finding in line with Aswathanarayana (1989), Krishnamoorthy (1991) and Susamma (1994).

Economic motivation established significant positive relationship in correlation analysis and failed to contribute in subsequent analyses. It is theoretically established and accepted that different motives of an individual energise and drive them towards the achievement of specific goals. Among different motives, economic motivation is finding a place of eminance. Being in a comparatively lower economic stratum, the urge for economic improvement would be an important motive among agricultural labourers. They are hard pressed for money to make both ends meet and they might have a cognition that economic progress is a precursor for overall development. Naturally those with high economic motive would have utilized the technologies more, which probably explains the above result. Studies by Anitha (1989), Rajendran (1992) and Susamma (1994) also confirmed this finding.

Results revealed a positive and significant relation between risk preference and utilization of IVPT. The minimum maximum - maximum minimum postulates reflecting individuals tendancy to minimise risk and maximise profits in varying circumstances could very well be cited here. It is a known fact that only persons willing to take risk have succeeded in different farm ventures. The initial

unfamiliarity and ambiguity of technological attributes and low level of inputs at one's disposal necessitates that only individuals with risk preference can better orient themselves to utilization of technologies and hence the finding. Rajendran (1992), Susamma (1994) and Sundarambal and Annamalai (1995) reported similar relationship.

It is the level of aspiration which drives an individual ahead and which imparts meaning for his actions. Agricultural labourers occupying the lower social stratum have low level of aspiration with majority falling in the low category. Those engaged in vegetable family farming with high level of aspiration would have set standards of high status to act as guidelines for better performance and as outlined by social bearing theory, individuals are apt to learn that the behaviour of such standards are frequently rewarded and reproducing such behaviour is likey to have favourable consequences. This would lead to more utilization of IVPT in family farming to raise living standards and hence the finding. Reddy (1987) and Devi (1994) also reported similar relationship between these variables.

Achievement motivation expresses an intrinsic value orientation that demands action for the sake of a sense of fulfilment. Since strongly motivated individuals generally ascribe success to their efforts, they experience more rewards and thus are more acative in attempting to achieve. Hence the observed positive relationship between achievement motivation and utilization of IVPT. In further analysis, this was found not having any significant influence. Studies by Naik (1988), Bonny (1991) and Reddy (1991) confirmed this result.

A higher level of management orientation implies a better involvement in activities related to planning, production and marketing aspects of any enterprise It was interesting to note that majority of agricultural labourers fell in the high category with respect to management orientation and this may be attributed to their associateship with big farmers over years where they play crucial role in farm planning, production and marketing aspects. Since management is often a neglected but critical input for consolidating the effects of other inputs on individual with good management orientation would be the forerunners in adopting farm technologies. This explains the positive and significant relationship between management orientation and utilization of IVPT. In multilinear and step down regression analyses, this contributed significantly and in path analysis its largest indirect effect was exerted through the variable extension orientation. This can be attributed to the process of "consensual validation" by which an individual attains congruency by checking his ideas and beliefs against those of other people (Secord and Backman, 1974). At adoption stage, extension functionaries are attached greater credibility by virtue of their expert power and legitimate power and individual with greater management orientation invariably will be with more extension orientation in adoption of farm innovations. Syamala (1988), Ramachandran (1992) and Sakharkar *et al.* (1992) reported a similar association.

It was a happy augury that extension orientation contributed significantly to utilization of IVPT by agricultural labourers, with its major indirect effect being

routed through information seeking behaviour. Majority being in the high category with respect to extension orientation, it can be assumed that agricultural labourers seek information on technologies from change agents indicating that extension faunctionaries exert their influence through their expert power by virtue of special knowledge and legitimate power by virtue of the fact that both accept certain norms and values which prescribe behaviour in a particular fashion (French and Raven, 1959). It can be deducted from the path analysis that extension orientation adds to information seeking behaviour and thus to technological adoption. Experience of change agent in one area may give rise to expectations of proficiency in aother areas as well. Satheesh (1990), Reddy (1991) and Ramachandran (1992) also substantiated this finding.

Cosmopoliteness as a characteristic variable was also found to wield its influence on the utilization of IVPT by agricultural labourers. It has been found in many studies by Prakashkumar (1986), Aswathanarayana (1989), Gopala (1991) and Rajendran (1992) that cosmopolitan farmers excel in the adoption of improved practices. More cosmopoliteness means more external exposure. A cosmopolitan individual is bound to be a better knower of scientific developments than a localite farmer. He is also expected to have better contact with extension agencies which would have facilitated his utilization of improved vegetable prodution technologies. Studies by Gopala (1991), Rajendran (1992) and Sakharkar *et al.* (1992) confirmed this finding.

The information threshold theory putforth by Gaikwad (1968) outlined that the high exposure of an individual to different information sources may enable him to compare the various technologies and select the most rational information to be used by him in his farming activity. When a farmer receives the same technology through different information sources, it may not be possible for him to resist his attention from being concentrated on that technology and its further use. Rogers (1958) has pointed out the importance of personal influence in adoption. This substantiates the positively significant relation observed between information seeking behaviour and utilization of IVPT. Its largest indirect effect in path analysis was exerted through the variable knowledge. Information seeking behaviour and knowledge are mutually dependant and each is the means and the end of the other. Labourers with more information seeking behaviour would have sound knowledge on IVPT which is crucial for proper adoption. Sulaiman (1989), Geethakutty (1993) and Theodore and Mansingh (1994) revealed positive relationships.

Knowledge is one of the three components of behaviour, which is vital for behavioural change and adoption. The concept of information influence (Deutsch and Gerard, 1955) indicated that when an individual possesses adequate knowledge, his or her actaivities are largely determined by a tendancy to conform with the knowledge level and hence the observed positive association between knowledge and utilization of IVPT. In subsequent regression and path analysis, this contributed significantly with its largest indirect effect being routed through information seeking behaviour. Knowledge determine and directs the information seeking behaviour and

it may also influence selectivity of information channels. Increased knowledge removers the initial unfamiliarity with a choice situation by greater familiarity and understanding of technological attributes and thus its adoption. Geethakutty (1993) and Susamma (1994) confirmed this finding by reporting a similar relationship.

4.6 Training need of agricultural labourers on Improved Vegetable Production Technologies (IVPT)

The pracatice-wise training needs of the respondents in vegetable cultivation is shown in Table 13.

Table 13. Practice-wise training need of agricultural labourers

Sl.No.	Practice	Total score	Rank
1	Improved varieties of crops	263	II
2	Nursery practices	213	V
3	Seed rate and sowing	202	VI
4	Manures and fertilizers	237	IV
5	Planting and after care	183	VIII
6	Plant protection measures	272	I
7	Irrigation	195	VII
8	Harvesting and post-harvest aspects	241	III

From the Table 13 it is clear that agricultural labourers perceived plant protection as the most important area where training is required. Plant protection

recorded the highest score of 272, followed by improved varieties of crops (26?), harvesting and post-harvest aspects (241) and manures and fertilizers respectively.

With meagre land of his own, an agricultural labour tries to derive maximum returns with minimum investments. The yield is seriously limited by the high incidence of pests and diseases. The toxic limits of inceticide application also pose serious concern to him as many of the vegetables are consumed raw. Hence the highest perception of training need in plant protection is quite understandable.

The perception of high training need in the area of plant protection is in conformity with the findings of Alexander (1985), Kanakasabapathi (1988) and Bonny (1991).

The next area of training need according to order of preference was improved varieties of crops. Most of agricultural labourers were growing only conventional varieties of vegetables which had only low yield potential. It was heartening to observe that some labourers who were part of the extension programme of the Kerala Agricultural University and the Department of Agriculture were aware of some promising varieties of vegetables and they might have a status of opinion leader to some extent. With meagre land under possession labourers engaged in family farming would have an eye not only on utilizing full labour potential of the family but to generate some additional income through surplus production. Improved varieties of vegetables occupy the foremost position in this since selection of varieties is the fundamental and momentous step. Moreover, in this era of

communication revolution, a farmer is pell well with immunerable crop varieties and a multiplicity of channels trying to establish credibility. In this context the training need preferred as above is justifiable.

Harvesting and post harvest aspects was ranked third in the order of training need preference. In addition to engaging themselves in family farming most of agricultural labourers were found either associated with commercial vegetable growers or in joint farming with fellow labaourers in leased in land. Due to the perishable and bulky nature of the produce, they suffer occasional set backs due to the loss incurred. Product diversification through value added products is the only means and this might have forced them opting this area as the third. An effective training programme offering necessary information regarding correct stages of harvest for processing and post harvest preservation techniques has to be provided.

Manures and fertilizers was the fourth area in which training was preferred. Agricultural labourers with experience of decades in farming are aware of the importance of different inputs even when they don't prefer using those in their own homesteads due to different bottlenecks. It was found that the beneficial effects of manuring have been well demonstrated to them while being a part in decision making and adoption in other farm holdings. The critical stages of manuring and the qualaity and methods of fertilizer application are being cared more than in previous times owin to the steeping costs of fertilizers.

Nursery practices, seed rate and sowing, irrigation and planting and after care occupied the subsequent positions in the order, which throws light in to the relatively less importance attached to these in a family farming homestead situation.

4.7 Major constraints perceived by agricultural labourers in the utilization of Improved Vegetable Production Technologies (IVPT)

Table 14 outlines the important constraints experienced by agricultural labourers in family farming utilizing IVPT.

It is explicit that uneconomic holding size, inadequacy of capital, increased cost of plant protection chemicals and fertilizers and lack of leisure time availability were the important constraints experienced by the agricultural labourers in vegetable family farming.

Vegetable family farming utilising improved practices requires considerable leisure time at disposal of the family. Since agricultural labourers derive their livelyhood from labour in other farms they obviously lack leisure time sufficient to incorporate improved crop production technologies the use of which yields more when cared most. Thus lack of leisure time availability becomes an important bottleneck.

Table 14. Major constraints perceived by agricultural labourers in the utilization of IVPT

(n = 100)

Sl.No.	Constraints	Cumulative index
1	Uneconomic holding size	364
2	Inadequacy of capital	355
3	Increased cost of plant protection chemicals and fertilizers	352
4	Lack of leisure time availability	329
5	Inadequate supervision and guidance by officers	317
6	Lack of knowledge about scientific vegetable cultivation	312
7	Water scarcity	302
8	Poor storage and other post harvest facilities	298
9	Non-availability of supply and other service	296
10	Inadequate market facilities	284
11	Low price for the produce	276
12	Non-availability of PP equipments	270
13	Incompatibility of technology	262

Inadequate supervision and guidance by officers was cited to be the next important constraint, which vindicates the fall of majority of agricultural labourers in the low category with respect to the variable extension guidance. In proper adoption of IVPT and its timeliness guidance is crucial and the emergence of this as

constraints points to the need to strengthen extension system among this weaker section of society.

Knowledge is the precursor for proper adoption behaviour. Majority of the agricultural labourers belonged to the low category regarding knowledge on IVPT and this was well substantiated by their perception of lack of knowledge about scientific vegetable cultivation as the next important constraints. This points the need of imparting training on improved vegetable production technologies suited to the needs of agricultural labour situations in marginal homesteads.

The size of holding has a bearing on adoption of modern crop production technologies. The inability to take risk because of small holding size makes the agricultural labourers entwined in extricabily in the coils of traditional and unscientific farming over the years. The constraints of uneconomic holding size was found forcing agricultural labaourers to engage themselves in vegetable farming in leased-in lands as a joined farming venture. However, cultivation in leased-in land probably restrict them in adopting improved practices which foster sustainability of land and soil, but to adopt practices which give immediate returns exploiting land to the maximum extent.

Most of the improved practices in vegetable production are capital intensive in the context of family farming in marginala homesteads of agricultural labourers. This was reflected in the constraint inadequacy of capital perceived as important by them. This was found as equally important as uneconomic holdng size.

This also throws light on the effects of lack of incentive provided specifically for the improvement of vegetable cultivation, especially in the marginal agricultural labourer households and to the necessity of interference by the credit system. For this agricultural labourers engaged in joined family farming in leased-in lands have to be viewed as a single system.

Increased cost of plant protection chemicals and fertilizers was cited to be the next important constraint. A satisfactory level of adoption of plant protection measures in comparison with other technologies suggests that even in vegetable family farming for sustenance also plant protection chemicals have become inevitable and that agricultural labourers cannot afford to ignore its utilization. Incidence of pest and diseases severely limit vegetable production. Improved varieties perform well only when supplemented by fertilizer application. This could have prompted them to perceive high cost of plant protection chemicals and fertilizers as an important constraint.

Other constraints in the order of importance were water scarcity, poor storage and post harvest facilities, non-availability of supply and other services, inadequate market facilities, low price of the produce, non-availability of plant protection equipments and incompatibility of technologies. Incompatibility of technology happened to be the least important constraint.

4.8 Consequences perceived by agricultural labourers to their utilization of improved vegetable production technologies in family farming

Taable 15 outlines the important consequences perceived by the agricultural labourers as a result of their involvement in vegetable family farming utilising IVPT.

Table 15. Consequence perceived by agricultural labourers to their utilization of IVPT in family farming

(n = 100)

Sl.No.	Constraints	Cumulative index
1	Economic utilization of leisure time	267
2	Enhancement of family income	263
3	Generation of additional employment	260
4	Promotion of family integrity	240
5	Increase in adoption level	231
6	Self confidence	217
7	Sense of accomplishment	211
8	Progress in living conditions	199
9	Self reliance	191
10	Lack of time to care children and other home operations	185
11	Increase in social status	173
12	Drudgery	160
13	Social recognition	132

The data reveal that economic utilization of leisure time, enhancement of family income, generation of additional employment, promotion of family integrity etc. were the important consequences which were perceived by agricultural labourers.

Out of the varied consequences, agricultural labourers perceived economic utilization of leisure time as the most important consequence. Economic betterment will be the leading motive behind any action of agriculturala labourers who are hard pressed in resourcelessness. Utilization of IVPT in family farming helped tap most of the leisure time at disposal of the family for productive pruposes. This indirectly reflects the satisfaction of agricultural labourers on one side and predicts continued increased utilization owing to positively perceived consequence on the other.

Enhancement of family income was the next identified consequence, establishing the fact that this section of society considers economic advantage as momentous. In addition to contributing to the home consumption, surplus production in leased-in lands enhances family income. Family farming saves lot of hired labour and causes deployment of otherwise wasted manpower of family for productive purposes.

Labour in agriculture is seasonal in nature and agricultural labourers seek alternatives during period of unemployment. Family faming involving IVPT

generate additional employment for them and majority of them perceived this as the third consequence.

Family farming being a collective approach aimed at enhancing family income, promotes the integrity of family. The placement of this as the fourth major consequence is thus well substantiated. When every member is oriented to the same objective, integrity becomes the inevitable consequence. Moreover, sharing of the risk lying latent in the incorporation of technologies would facilitate development of integrity.

Increase in adoption level was the next important consequence. The risk orientation and decision making ability of the family head will be more in family farming situation and utilizing the leisure time of the whole families more incorporation of modern technologies at sustainable level is possible. This increases the adoption level and his self confidence in having tapped the potentials of technology standing within the constraints. This justifies the falling of increase in adoption level and self confidence as the next important consequences.

In addition to perceiving the above consequences, agricultural labourers viewed sense of accomplishment, progress in living conditions, self reliance, increase in social status and social recognition as the other positive consequences. This throws light into the fact that family farming utilizing IVPT has multiplied effecets contributing to versatile development of agricultural labourers.

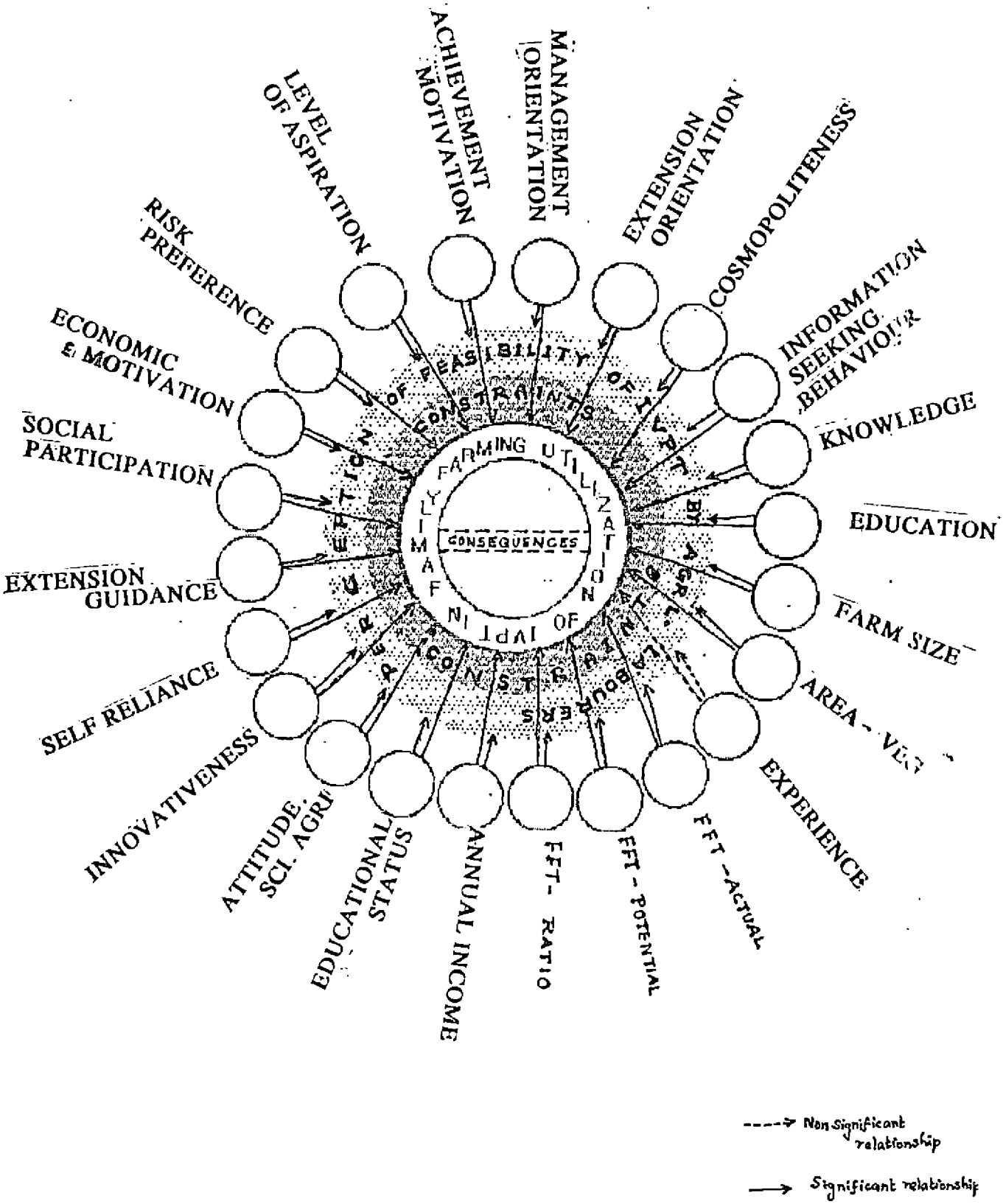
However, lack of time to care children and other home operations and drudgery were cited to be the negative consequences which have to be considered while formulating micro level development strategies for the marginal homesteads of agricultural labourers.

Empirical diagram for the study

The empirical diagram of the study is shown in Fig.7. All the variables except experience in vegetable cultivation exert their influences on the dependent variables feasibility perception and utilization of IVPT.

It could be reduced that perception of feasibility of practices affect the utilization of these practices with the constraints to adoption interplaying between these two variables.

It was consumed that the independent variables in the outer most circle affect the two dependent variables. The utilization of IVPT occupied in the inner most circle with the constraint circle and perception circle around it in order. Thus effect of each independent variable on the dependent variable was having a bearing on the feasibility perception and the bottlenecks to adoption.



Empirical diagram based on the findings of the study

Summary and Conclusion

SUMMARY AND CONCLUSION

On account of technological change in agriculture and decline in self employment, there has been a steep decline over the last few years in the proportion of self employed households in agriculture and an increasing casualisation of agricultural labourers. The agricultural labour and small farm household sector contribute not only the potential for growth but also provides the market for a sustained process of development. Standard of living of many agricultural families is low as a direct consequence of low productivity, underemployment and lack of opportunities in non-farm sector.

For the upliftment of agricultural labourers with meagre land of their own, concerted efforts are to be initiated such that from the land holding, maximum returns are ensured, utilizing the family labour. Since raising of vegetables is promising, the feasibility of improved production technologies and their utilization have to be analysed. Returns from vegetable growing are quite high and could be much higher if the improved technologies are adopted. Increases in vegetable area in agricultural labour homesteads will not only provide gainful employment for under utilized family labour but also would reduce income inequality among different sizes of farm. In this context, the present study was conducted with the following specific objectives:

i) to analyse the perception of feasibility of improved vegetable production technologies by agricultural labourers engaged in family farming.

ii) to assess the extent of utilization of improved vegetable production technologies in vegetable family farming.

iii) to identify the relationship between selected personal, socio-cultural and techno-economic factors and the utilization of improved vegetable production technologies.

iv) to assess the level of knowledge of agricultural labourers on improved production technologies.

v) to identify the constraints in and consequences of utilization of improved vegetable production technologies in family farming.

The study was conducted during 1994 in the Thrissur district. Five Panchayat (Pananchery, Puthur, Nadathara, Mattathur and Thekkumkara) were selected and 20 agricultural labourers were selected from each Panchayat and thus the total sample size was 100.

Perception of feasibility of improved vegetable production technologies (IVPT) by agricultural labourers engaged in family farming and their utilization of these technologies were the two dependent variables of this study. The personal, socio-cultural and techno-economic factors selected as independent variables are education, farm size, area under vegetables, experience in vegetable cultivation, family farming time per day, annual income, family educational status, self reliance, extension guidance, social participation, economic motivation, risk preference, level of aspiration, achievement motivation, management orientation, extension orientation, cosmopoliteness, information seeking behaviour and knowledge.

Feasibility perception and utilization were measured using arbitrary scale developed for the purpose. The independent variables were quantified using already existing scales or following established procedures. The required information was

collected through personal interview using a pre-tested structured interview schedule.

Percentage analysis, correlation analysis, multiple regression analysis, step down regression analysis and path analysis were employed in the analysis of the data and in interpretation of the results.

The salient findings of the study are furnished below:

1. Among the crops selected, amaranthus received the highest feasibility score followed by pumpkin, ladies finger, brinjal and bittergourd respectively. Bittergourd and brinjal received feasibility perception scores below the average feasibility score of 10.76.

2. Among the individual practices foliar fertilization in amaranthus received the highest feasibility perception score (2.96). Among crop varieties, bittergourd varieties were the least preferred (2.05) while pumpkin varieties were most preferred. Split application of fertilizers was most preferred in family farming.

3. Majority of agricultural labourers (59%) belonged to the medium category in extent of utilization of IVPT. Only 19 per cent were low adopters.

4. Amaranthus production technologies received the highest utilization score (6.15) while bittergourd received the lowest (5.35). In amaranthus cultivation, utilization index was highest for the practice of foliar fertilization (1.85), while it was plant protection measures (1.67) in Bhindi, improved varieties (1.59) in pumpkin. Split application of fertilizers received the high utilization index in brinjal and bittergourd cultivation.

5. In profile analysis maximum number of respondents in the high category was deserved for the variable management orientation (61%) followed by risk preference (60%), farm size (59%), innovativeness (59%), self-reliance (54%). Extension orientation (54%) and FFT-potential (51%). Maximum number of respondents (73%) was found in the low category in the variable social participation, followed by attitude towards scientific agriculture (68%) and extension guidance (66%).

6. All the independent variables, except experience in vegetable cultivation were found positively correlated with feasibility perception. In multiregression analysis, five variables namely, farm size, innovativeness, management orientation, cosmopoliteness and information seeking behaviour contributed significantly in the variations in feasibility perception. The coefficient of determination revealed that 56.80 per cent of the variations was explained by all the independent variables together. Unit increase in farm size generated 3.0906 units increase in feasibility perception *ceteris paribus* while it was 1.9688 and 1.6927 units in the case of innovativeness and information seeking behaviour.

7. In step down regression analysis, six variables namely, farm size, annual income, innovativeness, economic motivation, management orientation and knowledge explained 50.7 per cent variation in feasibility perception.

8. Results of the path analysis revealed that out of the selected independent variables, family size, annual income, innovativeness, economic motivation, management orientation and knowledge were significant in influencing the feasibility perception. Largest indirect effects of farm size, innovativeness and economic motivation were exerted through the variable knowledge, while these

of annual income, management orientation and knowledge were exerted thro igh the variable farm size..

9. The correlation analysis between the selected independent variables and utilization of IVPT revealed that all variables except experience in vegetable cultivation were positively and significantly correlated with utilization of IVPT by agricultural labourers. The multi-linear regression analysis though all these variables together experienced 80.70 per cent variations in the extent of utilization, contribution of seven variables were found to be significant. Unit increase in information seeking behaviour contributed to an increase of 8.017 units in the utilization behaviour ceferis paribus, while the contribution of area under vegetables (1.0997 units), Family Farming time - Actual (1.6003), social participation (3.2476) and knowledge (2.0822) also contributed significantly.

10. Step down regression analysis revealed that out of a total variation of 80.70 per cent by all the variables together, 77.28 per cent was contributed by nine variables namely area under vegetables, FFT-Actual, experience in vegetable cultivation, attitude towards scientific agriculture, social participation, management orientation, extension orientation, information seeking behaviour and knowledge.

11. In path analysis, knowledge on improved vegetable production technologies was found to exert the highest direct effect on the extent of utilization. Information seeking behaviour, FFT-Actual, social participation and attitude towards scientific agriculture exerted their largest indirect effects through the variable knowledge, while that of variables like area under vegetables and management orientation was through the variable extension orientation.

12. Majority of agricultural labourers (61%) belonged to the low category in knowledge on IVPT. Plant protection was cited to be the most preferred area where training was required, followed by improved varieties of crops, harvesting and post-harvest aspects and manures and fertilizers respectively.

13. Uneconomic holding size inadequacy of capital, increased cost of plant protection chemicals and fertilizers and lack of leisure time availability were the important constraints of utilization of IVPT in family farming.

14. Economic utilization of leisure time, enhancement of family income, generation of additional employment and promotion of family integrity were the important consequence perceived by agricultural labourers. Lack of time to care children and other house operations and drudgery were cited to be the negative consequences.

Implications of the study

1. In family farming situations of agricultural labourers amaranthus was found to have highest feasibility perception score while bittergourd scored the lowest. This was attributed to the more incidence of pests and diseases in bittergourd while amaranthus cultivation involved relatively lesser amount of inputs and lesser risk. Improved varieties of pumpkin were the most preferred while bittergourd varieties were least preferred. This suggests that in family farming for sustenance, agricultural labourers discard varieties demanding high plant protection costs. Among the individual practices foliar fertilization in amaranthus received the highest perception score, making it explicit that they consider the simplicity factor of technology as the momentous one. More over

the immediacy of return from input was also highlighted to be reason. Split application of fertilizers was cited advantageous since it avoided large investment of money at a time.

2. In determining perception of feasibility farm size, annual income innovativeness, economic motivation, management orientation and knowledge were found to be significant. Through farm size and knowledge indirect effects of other variables exerted making it explicit that these two were crucial in facilitating better perception of feasibility. Thus change agents are required to impart more knowledge in IVPT to agricultural labourers. Promotion of joint family farming will help them in nullifying the effects of small farm size which is found to be a major bottle neck.

3. Experience in vegetable farming failed to establish any significant effect on perception of feasibility. This suggested that in this era of rapid communication explosion, even a novice farmer enjoy sound access to information flow in farm sector.

4. The fall of majority of agricultural labourers in the medium range of adoption of technologies proved that they are technology oriented and innovative. The highest utilization score of amaranthus suggested that the feasibility perception behaviour had influenced the utilization. Agricultural labourers were found not to adopt the improved practices in bittergourd and brinjal which comparatively need high inputs. Rather than improved production technologies for individual crops, recommendations with an integrated approach involving combination of crops suited to the meagre land holdings of agricultural labourers was found necessary for sustainable development.

5. It was found that social participation, attitude towards scientific agriculture, family farming time - Actual, Extension orientation, Area under vegetables, management orientations and knowledge were significant in predicting the utilization behaviour of agricultural labourers in family farming. Highest direct effect in utilization was that of knowledge through which the indirect effects of information seeking behaviour, Family Farming Time-Actual, social participation and attitude towards scientific agriculture were exerted. Area under vegetables and management orientation were found influencing the adoptive behaviour of agricultural labourers by their indirect effects through the variable extension orientation. Thus knowledge and extension orientation are the crucial variables influencing utilization of IVPT.

6. Profile analysis revealed that out of the crucial variables predicting feasibility perception behaviour and utilization behaviour, majority of agricultural labourers belonged to the low category for variables , Area under vegetables (60%), Family Farming time-Actual (59%), Annual Income (57%), Attitude towards scientific agriculture (68%), Social participations (73%), Economic motivation (61%) and knowledge (61%). In the case variables farm size (59%), Innovativeness (59%), Management orientation (61%) and Extension orientation (54%) distribution of respondents in the high category was fairly high. This suggests that the level of Social participation, attitude towards scientific agricultural knowledge, Family Farming Time-Actual, Annual Income and Economic motivation are to be increased for better feasibility perception and utilization. Training Strategies have to be evolved with and eye to enhance level of these crucial variables.

7. In respect of their deficiency of expertise, majority of agricultural labourers have to be trained in advanced plant protection methods followed by improved crop varieties, harvesting and post harvest aspects and manures and fertilizers in the order of the perceived relevance to their specific situations.

8. Uneconomic holding size, inadequacy of capital, increased cost of plant protection chemicals and fertilizes and lack of leisure time availability were cited to be the important hurdles to utilization of technologies in family farming. Promotion of joint family farming involving a few families as a group will help them stand these hurdles. Joint management of the operations will avert the element of risk there by assisting in more adoption. The prospects of providing more capital to this lowest stratum of farming community have to be analysed taking a group of families as a single entity.

9. Perception of consequences like economic utilization of leisure time, enhancement of family income, generation of additional employments and promotion of family integrity as the foremost ones, substantiate that family farming involving IVPT has multiplied positive effects. But the negative consequences cited point to the need of appropriate development strategies to equip them with the skills of proper time management and elimination of the element of drudgery from day to day farming operations.

Suggestions for future research

1. Since the present study was felt voluminous, there seems a need to study the feasibility of technologies crop wise.

2. The relationship between feasibility perception and utilization as influenced by the constraints has to be studied.

3. Studies aimed to analyse the feasibility of joint family farming among agricultural labour households as mutual help labour exchange systems, will help formulate appropriate strategies for upliftment of these marginal holdings.

4. A detailed constraint analysis would be interesting to throw light into the dual farming roles of agricultural labourers, who while engaged in wage labour on the land holdings of others gets free access to technologies and feels quarantined to the technologies while in his homestead.

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Appendices

APPENDIX-I
KERALA AGRICULTURAL UNIVERSITY
REGIONAL AGRICULTURAL RESEARCH STATION
PATTAMBI

Dr.P.Rajendran
Associate Professor

Dept. of Agricultural Extension
18-3-1994

Sir,

Sri.Abdul Jabbar, P.K., M.Sc.(Ag.) student under my guidance is undertaking a research study entitled "Feasibility and Utilization of Improved Vegetable Production Technologies in Family Farming by Agricultural Labourers in the Thrissur district" as part of his research work.

In view of your professional experience and expertise, you have been identified as a judge for rating the relevancy of a list of independant variables furnished in the schedule attached. I therefore request you to kindly spare some of your valuable time for this purpose. You are free to add any new variable relevant to this study. I request you to return the list duly filled at your earliest convenience in the enclosed self addressed stamped envelope. Hoping your kind co-operation.

Thanking you,

Yours sincerely,

(P. Rajendran)

Encl: 1. Schedule
2. Stamped self-addressed envelop

Sl. No.	Independant variables	Relevancy				
		Most relevant	Relevant	Un decided	Less relevant	Least relevant
1	2	3	4	5	6	7
1	Age					
2	Education					
3	Farm size					
4	Family size					
5	Area under vegetables					
6	Experience in vegetable cultivation					
7	Family Farming time per day					
8	Annual income					
9	Family Educational status					
10	Attitude towards scientific agriculture					
11	Number of female children					
12	Innovativeness					
13	Scientific orientation					
14	Socio-economic status					
15	Self reliance					
16	Extension guidance					
17	Social participation					
18	Economic motivation					

19	Risk preference
20	Level of inspiration
21	Change pronences
22	Credit utilization
23	Credit orientation
24	Achievement motivation
25	Management orientation
26	Occupational status
27	Fatalism
28	Optimism
29	Thrift orientation
30	Extension orientation
31	Rationality in decision making
32	Deferred gratification
33	Cosmopoliteness
34	Cosmopolitinism
35	Information seeking behaviour
36	Market perception
37	Cropping intensity
38	Mass media participation
39	Knowledge of vegetable production techniques
40	Any other (Please specify)

APPENDIX-Ia

VARRIABLES SELECTED FOR RELEVANCY RATING WITH MEAN RELEVANCY SCORE

Sl.No.	Variable	Mean Relevancy Score
1	Education	2.81
2	Farm size	3.38
3	Area under vegetable	3.79
4	Experience in vegetable cultivation	2.91
5	Family farming time per day	2.97
6	Annual income	3.02
7	Family educational status	2.82
8	Attitude towards scientific agriculture	3.15
9	Innovativeness	2.98
10	Self reliance	2.91
11	Extension guidance	3.40
12	Social participation	2.89
13	Economic motivation	3.56
14	Risk preference	2.79
15	Level of aspiration	2.68
16	Achievement motivation	3.07
17	Management orientation	3.66
18	Extension orientation	2.74
19	Cosmopoliteness	2.79
20	Information seeking behaviour	3.85
21	Knowledge	2.80
Average mean relevancy score of 39 variables		= 2.66

APPENDIX-IIa
ITEMS OF KNOWLEDGE TEST

Knowledge of improved practices in vegetable cultivation

Give your responses for the following statements

Sl. No.	Items	Response
1	Little leaf is a serious disease of brinjal	True/False
2	Bacterial wilt is a serious problem in brinjal cultivation	Correct/Incorrect
3	A brinjal variety developed from the Kerala Agricultural University	Correct/Incorrect
4	Rotten fruits seen on brinjal are due to fungal diseases	Yes/No
5	The vector of pumpkin mosaic is	Correct/Incorrect
6	Mosaic affected plants gradually become healthy if retained in the field	True/False
7	Ambili is a variety of ashgourd	True/False
8	A waiting period of 11 days is necessary if carbaryl is applied on bittergourd	True/False
9	Application of nitrogen at vining and at full blooming is very much effective in bittergourd	True/False
10	Baiting with banana mixed with furadan effectively controls fruit flies	Ture/False
11	M.C. 84 is a good variety of pumpkin	True/False
12	Priya is a good variety of bittergourd	True/False
13	Amaranth variety Kannara local flowers in Nov-Dec. only	True/False
14	Spraying 1% urea immediately after each harvest is highly beneficial in Amaranthus	True/False
15	Kiran is an amaranth variety	Ture/False
16	Seed soaking for 24 hours before sowing is recommended for bhindi during summer	True/False

17	In brinjal and bhindi, granular application of phorate or carbofuran at seeding minimises pesticides application at later stages	True/False
18	Incorporation of neem leaves in the basins one week prior to planting reduces nematode attack on bhindi	True/False
19	Planting of vegetable in pits or trenches during summer helps in conserving moisture	True/False
20	Leaf webbers in amaranth can be controlled by spraying 0.1% Malathion	True/False
21	For Kharif crop of bhindi more plant to plant spacing is recommended than summer crop	Yes/No
22	Knots in roots of some vegetables are caused by nematodes	Yes/No
23	Spraying against fruit flies should be done at the ventral surface of leaves	True/False
24	A pesticide used to control fruit and shoot borers in binjal (----------)	True/False
25	Give the name of fungicide used for soil drenching in vegetable nursery (----------)	True/False

APPENDIX-IIb

Difficulty and Discrimination Index of knowledge test items

Item number in the initial test	Freqency of correct answers		Total frequencies	Percentage of respondents giving correct answers (P)	$E^{1/3}$
	S_1	S_2			
1*	8	4	12	40.00	0.40
2*	8	5	13	43.33	0.30
3	5	2	7	23.33	0.20
4	4	2	6	20.00	0.20
5	2	1	3	10.00	0.10
6*	10	4	14	46.66	0.60
7	4	2	6	20.00	0.20
8	3	1	4	13.33	0.20
9*	8	4	12	40.00	0.40
10*	8	2	10	33.33	0.60
11	2	0	2	6.66	0.20
12*	6	3	9	30.00	0.30
13*	7	3	10	33.33	0.40
14*	8	5	13	43.33	0.30
15	3	2	5	16.66	0.10
16*	8	4	12	40.00	0.40
17*	9	3	12	40.00	0.60
18	2	1	3	10.00	0.10
19*	8	5	13	43.33	0.30
20	2	1	3	10.00	0.10
21*	8	4	12	40.00	0.40
22*	7	3	10	33.33	0.40
23	5	3	8	26.66	0.20
24*	8	3	111	36.66	0.50
25	2	0	2	6.66	0.20

* Final items selected

FEASIBILITY OF UTILISATION OF IMPROVED VEGETABLE PRODUCTION TECHNOLOGIES IN FAMILY FARMING BY AGRICULTURAL LABOURERS IN THRISSUR DISTRICT

INTERVIEW SCHEDULE

PART-A

Name of the Panchayath.....

1. Name and address of the farmer (Agrl. labourer) :

   Age :

2. Education : Illiterate/Can read only/Can read and write/ Primary school/Middle school/High School

3. Farm size (cents) :

4. Area under vegetables (cents) : (Own land)/(Leased in)

5. Experience in vegetable cultivation (yers) :

6. Family farming time per day
   Actual :
   Potential :

   Hired labour :

7. Annual income (Rs.)

   a) From agriculture :
   b) From non-farming source :

   Total income :

8. Family education status

Name	Age	Educational Status I (O)	R (1)	R&W (2)	P (3)	M (4)	H (5)	C (6)
1.								
2.								
3.								
4.								
5.								

9. Attitude towards scientific agricultural practices

	SA	A	UD	DA	SDA
1. Food grain production can be increased only by cultivating HYV					
2. High yielding varieties deteriorate the quality of soil					
3. Application of chemical fertilizer increases the production of crops					
4. Continuous use of chemical fertilizers spoil the soil					
5. Crop production can be increased only by using chemical fertilizers					
6. Application of chemical fertilisers is a waste of money and time					
7. Adoption of recommended spacing facilitate easy intercultural operation					
8. Spacing is a sheer waste of land					
9. Application of pesticides is harmful to crops					
10. Use of pesticides is not a profitable practice					
11. Plant protection by means of chemical compounds causes environmental pollution					
12. Modern plant protection practices save money and time					
13. Heavy crop losses have not occured since the invention of modern scientific plant protection practices					
14. A successful farmer must use fungicide and pesticide					

10. Innovativeness
When would you prefer to adopt an improved practice in farming?

1. As soon as it is brought to my knowledge :

2. After I have seen some other farmers using it successfully :

3. Prefer to wait and take by own time :

11. Self reliance:
How much of your future you feel depends on yourself (out of 100 per cent)

100 per cent/75 per cent/50 per cent/25 per cent/Not at all

12. Extension guidance

i) How much of technical guidance was received during the last one year : Very adequate/Adequate/Not adequate

ii) How useful was the technical guidance you have received : Very much/Much/Least

13. Social participation

	Participation			Frequency of participation		
	Yes/No	As member	As Office bearer	Regularly	Occasionally	Never
Panchayat						
Co-operative Society						
A.D.C.						
Farmers' Organisation						
Arts & Sports Club						
Group Farming Padasekharam						
Any other						

14. Economic motivation
Indicate whether you agee/disagree with the following statements

	Agree	Disagree
1. A farmer should work toward larger yields and economic profit		
2. The most successful farmer is one who make the maximum profit		

	Agree	Disagree
3. A farmer should try any new farming idea which may earn him more money		
4. A farmer should grow cash crops to increase monetary benefits in comparison to growing of food crops for home consumption		
5. It is difficult for the farmer's children to make good start unless be provides them with economic assistance		
6. A farmer must earn his livings, but the most important thing in life cannot be defined in economic term		

---

15. Risk preference
Do you agree with the following statements

	Agree	Disagree
1. A farmer should be willing to take greater number of risks to stay in farming		
2. It is best for a farmer to use old methods, proven over year		
3. Trying new methods involves much danger or loss		

16. Level of aspiration

You see the picture of a ladder with 10 steps. Suppose we say that the top of the ladder (pointing up) represents the best possible life for you and the bottom (pointing down) represents the worst possible life for you)

a) Where on the ladder do you fee personally stand at present? Step No.

b) Where on the ladder do you feel personally you stood 5 years ago? Step No.

c) Where do you think you will be in five years from now? Step No.

10
9
8
7
6
5
4
3
2
1
0

17. Achievement motivation
Check one of the alternatives the each items

Sl.No.	Items	Categories				
1.	Success brings relief or further determination and not just pleasant feedlings	Strongly agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly disagree (1)
2.	How true it is to say that your efforts are directed towards avoiding failure	Quite untrue (1)	Not very true (2)	Unsure (3)	Fairly true (4)	Quite true (5)
3.	How often do you seek opportunity to excell?	Hardly ever (1)	Seldom (2)	About half the time (3)	Fre-quently (4)	Nearly always (5)
4.	Would you hasitate to undertake something that might lead to your failing?	Hardly (1)	Seldom (2)	About half the time (3)	Fre-quently (4)	Nearly always (5)
5.	How many situations do you avoid in which you may be exposed to evaluation?	Most (1)	Many (2)	Some (3)	Few (4)	Very few
6.	In how many spheres do you thing you will succeed in doing as well as you can?	Most (5)	Many 94)	Some (3)	Few (2)	Very few (1)

18. Management orientation
a) Planning orientation (Give your agreement/disagreement)

	Agree	Disagree
1. Each year one should think of afresh about crops to be cultivated in each type of land		
2. It is not necessary to make prior decision about the variety of crops to be cultivated		
3. The amount of seeds, fertilizers, pp chemicals, needed for raising a crop should be assessed before cultivation		
4. It is now necessary to think ahead of the cost involve in raising a crop		

Agree Disagree

5. One need not consult any agricultural exper for planning

6. It is possible to increase yield through farm protection

b) Production orientation

1. Timely planting of a crop ensures good yield

2. One should use a much fertilizers as he likes

3. Determining fertilizer dose by soil testing saves time

4. For timely weed control one should even use suitable herbicides

5. Seed rate should be given as recommended by the specialists

6. With low water rates one should use as much irrigation water as possible

c) Marketing orientation

1. Market is not useful to farmer

2. A farmer can get good price by garding his practice

3. Processing facilities can help a farmer to get better price for his produce

4. One should sell his produce for the nearest market irrespective of price

5. One should purchase his inputs from the shop where his relatives purchase

6. One should grow these crops which have more market demand

19. Extension orientation

a) Extension contact

Category of personnel	Grequency of contact				
	Twice or more a week	Once a week	Once a fortnight	Once a month	Never
Assistant Director of Agrl.					
Agricultural Officer					
Agricultural Assistanta					

b) Extension participation

Sl.No. Activities	Attending whenever	Occasionally attending	Never attending
1. Study tours			
2. Seminars			
3. Farm fair			
4. Meeting of the group			
5. Demonstrations			
6. Others (specify)			

20. Cosmopoliteness

a) Frequency of visit to nearest town

1. Twice or more a week
2. Once a week
3. Once a fortnight
4. Once a month
5. Very rarely
6. Never

b) Purpose of visit to the town in a month

1. All visits relating to agriculture
2. Some visit relating to agriculture
3. Personal/domestic matters
4. Entertainment

21. Information seedking behaviour

Source	Frequency				Purpose	
	Regularly	Sometimes	Rarely	Never	For the vegetables + other crops	For vegetables alone
1. Mass media sources						
T.V.						
Radio						
Films						
Newspapers						
Farm publications						
Agrl.Exhibitions						
2. Personal cosmopolite sources						
Research scientists						
Agrl. Officers						
Agrl. Assts.						
Others (specify)						
3. Personal localite sources						
Progressive farmers						
Neighbours						
Friends						
Relatives						

PART-B

Feasibility and utilisation of improved vegetable production technologies

Practices	Feasibility				Utilization		
	Very much feasible	Moderately feasible	Less feasible	Not feasible	Proper utilization	Improper utilization	No utilization
Brinjal							
1. Spacing of 60 x 75 cm							
2. Improved varieties							
3. Transplanting at 30-45 DAS							
4. Manures and manuring a) Fertilizer dose of 75:40:25 b) Split application of N & K							
5. Plant protection measures							
Bittergourd							
1. Spacing							
2. Varieties							
3. Manures & manuring a) Fertilizer dose of 70:25:25 b) Split application of N							
4. After cultivation							
5. Plant protection measures							
Amaranthus							
1. Varieties							
2. Spacing at transplanting							
3. Manures and manuring							
4. Foliar fertilization							
5. Plant Protection measures							

Practices	Feasibility				Utilization		
	Very much feasible	Moderately feasible	Less feasible	Not feasible	Proper utilization	Improper utilization	No utilization
Bhindi							
1. Varieties							
2. Spacing (60 x 30 for summer) (60 x 45 for Kharif)							
3. Seed soaking							
4. Manures and manuring							
5. Plant protection measures							
Pumpkin							
1. Improved varieties							
2. Spacing (4.5 x 2.0)							
3. Manures and manuring							
4. After care							
5. Plant protection measures							

PART-C

Knowledge of improved practices in vegetable cultivation:

Give your responses for the following statements

Sl. No.	Item	Response
1	Little leaf is a serious disease of brinjal	True/False
2	Bacterial wilt is a serious problem in brinjal cultivation	Correct/Incorrect
3	Mosaic affected plants gradually become healthy if retained in the field	True/False
4	Application of nitrogen at viving and at full blooming is very much effective in bittergourd	True/False
5	Baiting with banana mixed with furadan effectively conteols fruit flies	True/False
6	Priya is a good variety of bittergourd	True/False
7	Amaranth variety Kannara local flowers in Nove-Dec. only	True/False
8	Spraying 1% urea immediately after each harvest is highly beneficial in Amaranthus	True/False
9	Seed soaking for 24 hours before sowing is recommended for bhindi during summer	True/False
10	In brinjal and bhindi, granular application of phorate or carbofuran at seeding minimises pesticide application at later stages	True/False
11	Planting of vegetable in pits or trenches during summer helps in conserving moisture	True/False
12	For Kharif crop of bhindi more plant to plant spacing is recommended than summer crop	True/False
13	Knots in roots of some vegetables are caused by nematodes	True/False
14	A pesticide used to control fruit and shoot borers in brinjal (----------)	True/False

PART-D

Please give the perception of your training need in the following subject matter areas related to cultivation of vegetable crops

Subject matter	Most needed	Necessary	Least needed
1. Improved varieties of crops			
2. Nursery practices			
3. Seed rate and sowing			
4. Manures and fertilizers			
5. Planting and after care			
6. Plant protection measures			
7. Irrigation			
8. Harvesting and post harvest aspects			

PART-E

Constraints in utilization of recommended practices

Which one of the following constraints would you identify as the most importan. and important/Less important/Least importanct?

	Most important	Important	Less important	Least important
1. Poor storage and other post harvest facilities				
2. Lack of knowledge about scientific vegetable cultivation				
3. Uneconomic holding size				
4. Inadequace of capital				
5. Non-availability of supply and other services				
6. Inadequate suppervision and quidance by officers				
7. Inadequate market facilities				
8. Water scarcity				
9. Low price for the produce				
10. Non-availability of pp equipment				
11. Increased cost of PP chemicals				
12. Incompatibility of technology				
13. Any others (please specify)				

PART-F

Perceived consequences of utilization

	Most perceived	Moderately perceived	Least perceived
1. Increase in adoption level			
2. Increase in social status			
3. Enhancement of family income			
4. Progress in living condition			
5. Generation of additional employment			
6. Economic utilization of leisure time			
7. Drudgery			
8. Lack of time to care children and other home operations			
9. Social recognition			
10. Self reliance			
11. Self confidence			
12. Sense of accomplishment			
13. Promotion of family integrity			
14. Any other (please specify)			

FEASIBILITY AND UTILIZATION OF IMPROVED VEGETABLE PRODUCTION TECHNOLOGIES IN FAMILY FARMING BY AGRICULTURAL LABOURERS IN THE THRISSUR DISTRICT

By

ABDUL JABBAR, P. K.

ABSTRACT OF THE THESIS

submitted in partial fulfilment of the
requirement for the degree of

Master of Science in Agriculture

(AGRICULTURAL EXTENSION)

Faculty of Agriculture
Kerala Agricultural University

DEPARTMENT OF AGRICULTURAL EXTENSION

COLLEGE OF HORTICULTURE
VELLANIKKARA, THRISSUR

1996

ABSTRACT

The research study entitled "Feasibility and Utilization of Improved Vegetable Production Technologies in family farming by agricultural labourers in the Thrissur district" was conducted to analyse the feasibility and utilization of vegetable production technologies in family farming by the agricultural labourers in Thrissur district in relation to their personal and socio-economic factors and to assess the constraints and consequences these of.

The study area comprised of five panchayats namely, Pananchery, Puthur, Nadathara, Mattathur and Thekkumkara and a total of 100 agricultural labourers engaged in family farming were selected as respondents. Data were collected from the agricultural labourers using a pre-tested structured interview schedule. Appropriate statistical techniques like correlation analysis, regression analysis and path analysis were done to analyse the data.

The perception of feasibility of technologies and extent of utilization were measured using arbitrary scale developed for the purpose. Five crops namely, brinjal, bittergourd, pumpkin, ladies finger and amaranthus were selected for the study with five selected practices under each crop.

The study revealed that amaranthus received the highest feasibility score, while bittergourd and brinjal received feasibility perception scores below the average feasibility score. Foliar fertilization in amaranthus received the highest feasibility perception score. Among crop varieties, pumpkin varieties were the most preferred while bittergourd varieties got the least scores.

Majority of agricultural labourers belonged to the medium category in extent of utilization and only 19 per cent were low adopters. Amaranthus production technologies received the highest utilization score while bittergourd received the lowest. Split application of fertilizer received the high utilization index in brinjal and bittergourd cultivation.

The correlation analysis revealed that all independent variables except experience in vegetable cultivation were positively correlated with feasibility perception. Variables like farm size, annual income, innovativeness, economic motivation, management orientation and knowledge were significant in influencing the feasibility perception. All variables except experience in vegetable cultivation were found positively correlated with utilization of IVPT. Knowledge on IVPT exerted the largest direct effect. Information seeking behaviour, FFT-Actual, social participation and attitude towards scientific agriculture, management orientation, area under vegetables and extension orientation were found to influence significantly.

Plant protection was cited to be the most preferred area where training was required, followed by improved varieites of crops harvesting and post harvest aspects and manures and fertilizers respectively. Constraints such as uneconomic holding size, inadequacy of capital, increased cost of plant protection chemicals and lack of leisure time availability were cited as most important. Economic utilization of leisure time, enhancement of family income, generation of additional employment and promotion of family integrity were the important consequences. Lack of time to care children and other house operations and drudgery were cited to be the negative consequences.