REORIENTING THE CONCEPT OF AGRICULTURAL DEVELOPMENT IN THE CONTEXT OF KERALA

By

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THESIS
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DECLARATION

I hereby declare that this thesis entitled "**Reorienting the concept of agricultural development in the context of Kerala"** is a bonafide record of research work done by me during the course of research and this thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title of any other University or Society.

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INTRODUCTION

1. INTRODUCTION

India greeted the year 2007 to the sixtieth anniversary of her independence and the fresh start of another Five year plan. Roughly about 73 per cent of Indian populace depends on agriculture, a sector contributing only 22 per cent to state income as per statistics (Economic survey, 2006). Though financial outlay on agriculture took a steady increase, contribution to national GDP declined considerably. Average growth rate for agriculture and allied sector for tenth five year plan (2002-07) was recorded as 2.7 per cent with 18.5 per cent share in GDP as against targeted 4 percent (Economic survey, 2004).

India has witnessed many revolutions: Green, white, blue, yellow and ultimately the rainbow revolution. But the advantages of these revolutions are not being reflected on the living conditions of rural India (the heart of India), whereas urban living style has gone far ahead of a common peasant's imagination (Verma, 2000). Novel ideas though, failed to permeate into rural India. When Gandhiji stated that India's prosperity lies in the development and progress of rural India, he envisaged that rural India and agriculture are nearly synonymous and the rural dimension in Indian economy is of towering importance. The increased imbalance in agricultural development has led to wide agrarian distress leading to farmers' suicides leaving far behind how it was celebrated in Thirukural.

'They live who live to plough and eat, the rest behind them bow and eat'.

It is rudimentary to account agricultural development in terms of statistical figures alone regardless of the fact that agriculture is multidimensional. Hence, it is imperative to refurbish a balanced and holistic approach towards agricultural development so that it encompasses the unseen, unveiled dimensions of agricultural development. There should be a balance among the facets of agriculture or else it may turn perilous.

"Man did not weave the web of life; he is merely a strand of it.
Whatever he does to the web, he does to himself" -Seattle chief, 1851

The approach paper to eleventh Five year plan has aptly highlighted a holistic frame work and suggested strategies to double the irrigated area, improve water management, water harvesting and watershed development, to reclaim degraded land, to bridge knowledge gap through effective extension, to diversify into high value outputs ensuring food security, to promote animal husbandry and fisheries, easy access to credit and focus on land reforms issues (Economic survey, 2007). The National Commission on Agriculture has already laid the foundation for such a framework.

In the 'draft strategic action plan for development — 2020' documented by the M.S. Swaminathan Research Foundation, it is quoted that the government did take concerted steps to meet the minimum needs of the population for food, but it, however, tended to overlook the potential to utilize agriculture as an "engine for economic growth and job creation".

The Commission on WTO concerns in Agriculture reported (WTO report, 2001) that the WTO-controlled global trading system within which Kerala must now seek to strengthen its agriculture and reorient agricultural trade, is one that is "inherently asymmetric in its impact". As a beginning, Virtual University for agrarian development has been set up as per the recommendations of the Commission in Kerala Agricultural University in collaboration with the Indian Institute of Information Management, Kerala. It deals with collection, documentation, analysis and interpretation of market and trade information and to build up a sustainable agricultural trade security system.

In this progressive path of agricultural resurrection, a comprehensive multi dimensional understanding of agricultural development shall serve as the firm base to development. In the present context of Kerala where the local

administrative bodies are vested with more powers to plan and execute developmental activities as the result of increased decentralized planning, a better understanding of the concept of agricultural development is imperativel.

Conceptual clarity determines the success of any idea. Agricultural scientists, extension personnel, elected heads of local administrative bodies and progressive farmers belong to the genre responsible to draw a framework for agricultural development. Since agriculture is a state subject, the success in agricultural performance is crucially dependent on the policies and actions initiated by the states. This is an opportune time, therefore, to give serious considerations to various facets of agricultural development in the state against the backdrop of the new economic policies pursued at the central level (Vyas and Bhargava, 1997).

It is in this background that the relevance of the present study titled 'Reorienting the concept of agricultural development in the context of Kerala, gains gravity. The objectives of the study are as follows:

a) To study the existing concept of agricultural development in Kerala as perceived by agricultural professionals, farmers and elected members of local administrative bodies
b) To systematically analyze the lacks and lapses in the existing concept
c) To identify and streamline the missing components for a more holistic model
d) To propose a reoriented multidimensional model for agricultural development in the context of Kerala

Scope of the study

The concept of the study and one of the tools (concept mapping) employed for research is a pioneering one. In the present decentralized set up of Kerala local governance has more powers and funds to conceive, formulate and implement

development projects with people's participation. Perceptual differences among major stakeholders of agricultural development *i.e.,* progressive farmers, agricultural extension officers, elected heads of local governing bodies and agricultural scientists, pose blocks to the formulation and execution of winning projects. Given the socio-demographic peculiarities of Kerala, a comprehensive framework is necessary to have a broad outlook towards the concept of agricultural development.

Limitations of the study

The present study was undertaken as part of a post graduation research programme and it had the inherent limitations of time, money and sample size. As the study was of qualitative nature, selection of limited number of respondents might have impeded the result outcome. Open ended survey question invited mixed responses from the respondents. While it offered opportunity for self expression, certain factors like time, involvement factor and effort to organize thoughts into meaningful depiction caused some of the respondents to leave focal question unanswered. Though paucity of descriptive literature in this area of research posed hindrances, sincere effort was taken to present a comprehensive picture.

Presentation of the thesis

The thesis is presented in six chapters. In the first chapter i.e., introduction gives a brief account of the background and relevance of the study. Chapter two covers the review of available literature pertaining to the present investigation. The detailed description of the methodology and statistical tools employed is furnished in chapter three. The results are compiled and systematically arranged supported by graphs and maps in chapter four. The fifth chapter discusses the relevance and importance of the results generated. The chapter six summarizes the study and is followed by references, appendices and abstract of the thesis.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

“Deeper you dig the sand, sooner the spring flows
Deeper your quest goes, better your knowledge grows” (Thirukural)

Any systematic scientific enquiry has its foundation built upon studies in the past. The main objective of this chapter is to review the theoretical and empirical information available from similar or at least related studies. Such recapitulation could serve as a basis for delineating an ideal conceptual framework for the present project and relating its empirical findings with those of earlier investigation.

The literature is reviewed under the following heads:

2.1 Meaning of development
2.2 Meaning of agricultural development
2.3 Perception of agricultural development
2.4 Models of agricultural development

2.1. MEANING OF DEVELOPMENT

MacIver and Page opined (1949) development as an upward course in a process that is of increasing differentiation. Adelman and Morris (1949) adopted a multi-indicator theory of development including transformations of production structures as well as social, cultural and political modernization.

Steinmetz (1969) stated development as a long-term educational process utilising a systematic and organised procedure by which managerial personnel learn conceptual and theoretical knowledge for general purpose. In the dynamic process of development, Rosenberg (1969) pointed out that, the emergence of imbalance or disequilibrium is a critical element in inducing technical change and economic growth. Disequilibrium among the several elements in the system creates the bottlenecks which focus the attention of

scientists, inventors, entrepreneurs, public administrators on the solutions of problems for attaining more efficient resource allocation.

Dag Hammarskjold Foundation (1975) defined that development is a whole; it is an integral, value-loaded, cultural process; it encompasses the natural environment, social relations, education, production, consumption and well being.

Development connotes growth of maturation. It implies gradual and sequential phases of change (Dahama and Bhatnagar, 1985). Sustainable development is development that meets the need of the present without compromising the ability of future generations to meet their own needs , defined Brundtland Commission (1987) in 'Our common future', report on world commission on environment and development. Environmental dimension, economic dimension and social dimension are the three dimensions identified in the report.

Agrawal (1999) defined development as a sustained increase in the real per capita income together with an improvement in the distribution of material welfare.

Chakrabarti and Cullenberg (2002) opined that for society to progress, the centre must be strengthened and once that is done, development would percolate to the periphery. So development came to be associated with the rate of development of capital accumulation. Even the world system theorists, like Frank and Wallerstein, who identified developed countries-the centre- as the cause of under developed in the peripheral countries, considered the growth of industrial centre in the peripheral countries to be crucial for the development of the periphery.

Menon (1995) opined that development in the Indian context aims at transforming traditional agrarian rural society into a modern agro based egalitarian society.

Sustainable development is a multidimensional concept, involving not less than seven dimensions. Sustainable development is viewed as the mutually beneficial interaction between the legitimate interests of business and the economy, government and

the polity, and civil society and culture. The dimensions identified are spiritual, human, social, cultural, political and economic and ecological (Philippine agenda, 1996).

Development is a dynamic process in the desirable direction. The desirability of direction and propriety of process have changed over the years in search of alternative strategies for sustained growth. From an unbridled development, the thrust is shifting gradually to development with justice and to self sustainable development (Joseph, 1997).

Adelman (1998) elucidated that most of the development literature and prescriptions for development policy have concentrated on the purely economic aspects of the development process and ignored interactions with social factors, political institutions and with institutional and cultural change. Both the process of development and development policy are interdependent, multi faceted, dynamic and highly non-linear. Adelman (2000) stated that the only constant in development is systematic dynamic change. Singh and Fazal (2000) identified development as a transcendental concept. According to them it is a human enterprise; it is a metadisciplinary phenomenon: an ideology by itself. Since it is a human enterprise, it is culture specific in content and manifestation. It implies organic change. Its aim is to foster a rich life as defined by a given culture.

Annan (2002) stated that our biggest challenge in this new century is to take an idea that seems abstract-sustainable development- and turn it into a reality for the entire world's people.

Haris (2003) recognized three dimensions as pillars of sustainable development: Economic Dimension, Environmental Dimension and Social Dimension.

2.5 MEANING OF AGRICULTURAL DEVELOPMENT

Agricultural development has suffered on account of incomplete planning, particularly at the local levels. The central fact to be kept in view is that agriculture lies,

almost entirely, in the private, unorganised sector. The biggest proportion of the farming community is composed of small and marginal farmers with their unique poor resource base and related problems.

Hayami and Ruttan (1971) opined that the design of a successful agricultural development strategy involves a unique pattern of technical change and productivity growth in response to the particular set of factor prices that reflect the economic implications of resource endowments and accumulation in each society. Viewed in a historical context, they comprehended that the problem of agricultural development is not that of transforming a static agricultural sector into a modern dynamic sector, but of accelerating the rate of growth of agricultural output and productivity, consistent with the growth of other sectors of a modernizing economy

Shenoj (1975) observed that agricultural development involves a large number of complementary activities to be performed by different units-public, co-operatives and private units at different level.

Hague *et al.* (1977) comprehended agricultural development as the improvement in productivity of foreign exchange earning crops like coconut and pepper and thereby enhancing the economic status of farmers, especially small holders. Agriculture development is an outcome of developing people's ability to set up goals, make decisions and carry out their plans (Sankariah and Deithmuller, 1977)

Alexander (1982) pointed out that agriculture development would lead to

1. The transformation of subsistence agriculture to commercial agriculture
2. Increase in commercial activities
3. Increase in decision of labour in agriculture
4. Transformation of occupational structure
5. Modernization of beliefs and values

As one deepens his understanding of agricultural development he can see more easily where and how his own agency does or ought to fit in (Moscher, 1975). Sustainable agriculture is a model of social and economic organization based on an equitable and participatory vision of development which recognizes the environment and natural resources as the foundation of economic activity. O'Connell (1992) pointed out that agriculture is sustainable when it is ecologically viable, socially just, culturally appropriate and based on a holistic scientific approach.

Allen (1993) expressed that agriculture does not exist and cannot function except at the intersection of society and nature. Stauber (1995) recognized philosophical underpinning of industrial agriculture as assumptions that follow:

a. Nature is a competitor to be overcome
b. Progress requires unending evolution of larger farms and depopulation of farm communities
c. Progress is measured primarily by increased material consumption
d. Efficiency is measured by looking at the bottom line
e. Science is an unbiased enterprise driven by the natural forces to produce social good

According to Sinha (1996), agricultural development is a process which is continuous and dynamic.

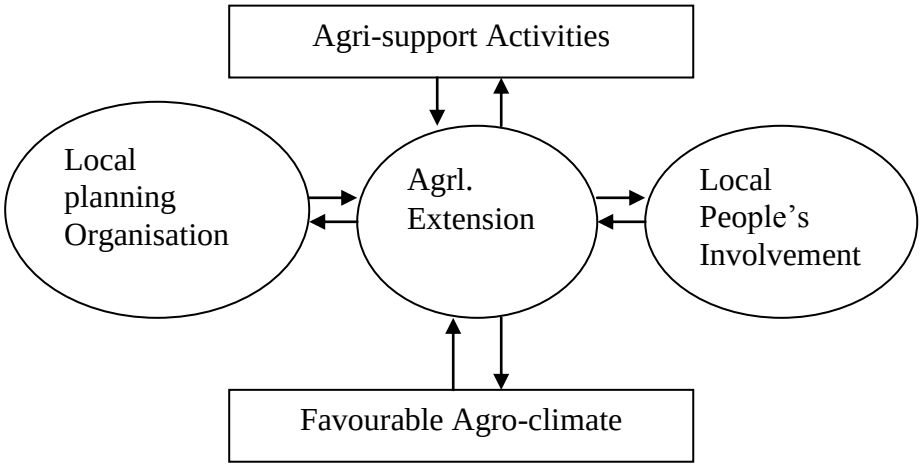
Suresh (1999) considered agricultural development as the development that occurs in the sphere of agriculture. It is referred to, as the considerable increase in the productivity of crops resulting from the modern techniques, which in turn will shape meticulously the socio- economic condition of the farmers. According to him agricultural development strategy should be developed in such a way so that maximum utilization of local resources, by working out optimum combination of enterprises, resources, various methods and practices, is possible.

FAO used three indicators *viz.*, expenditure intensity, contact intensity, technical manpower and cultivation ratio (TC ratio) to compare the performance of agencies involved in agriculture development (FAO, 2000). Success of economic planning depends to a very large extent upon the success of agricultural planning and development (Singh and Fazal, 2000).

The strategic action plan for development — 2020 prepared by the Union Ministry of Agriculture and documented by the B.V. Rao Centre for Sustainable Food Security, M.S. Swaminathan Research Foundation, Taramani (Chennai) stressed the need for growth entailing sustainable development, ensuring not just food but even nutrient security and avoidance of profligacy in farm practices to avoid ecological imbalance. It pointed out that there has to be a proper mix of geonomics and molecular, information technology and ecotechnology to improve productivity. In sum, need for "integrated natural resource management" (Swaminathan, 2000).

Ikerd pointed out that (2000) sustainable agriculture must be about sustaining people through agriculture, not just sustaining agriculture. Sankaran and Rai (2002) opined that agricultural development strategy for India in the 21st century must be through increasing productivity of land under cultivation with reduced costs of production and higher use efficiency of inputs with no harm to the environmental quality.

Banerjee (2003) expressed that after more than 200 years of industrialization in the Western World and more than fifty years of development in the Third World, the benefits delivered by the grand design of progress and modernity are ambiguous. Despite phenomenal advances in science, technology, medicine and agricultural production, the promise that development would eradicate world poverty remains unfulfilled in several parts of the globe, especially in the Third World . According to Jalihal (2004), the major components of agricultural development are agri-support, agri-climate, local planning, local leaders and local people.



The national policy on agriculture seeks to bridge the yield, productivity and production gaps and sustainably improve rural employment opportunities, income, equity, livelihood security and environmental security. The policy envisages promotion of sustainable agriculture through a regionally differentiated approach, development and transfer of technology, improvement of input use efficiency, incentives for agriculture, strengthening of infrastructure, risk management and management reforms (Singh and Padaria, 2004). In the changing agricultural and rural development scenario, there is a need to involve the three partners *ie.*, research, extension and client to work in participatory mode for sustainable agricultural development (Padaria, 2004). Moni (2004) opined that multifunctionality- an economic activity (producing goods) and a service to the community (food security), rural employment and environmental obligations such as soil conservation, sustainable natural resource management and biodiversity protection- is crucial to sustainable agricultural and rural development in our country. Multifunctional agriculture is the bottom line in our country.

The traditional understanding of agricultural development assistance focuses on improving productivity on the farm. However, approaches have changed. Agricultural development assistance includes wide range of investments and activities that contribute to foster economic development and reduce poverty and hunger. Howard and Taylor (2005) examined that agriculture development includes natural resources management and many other activities that contribute to improved productivity on the farm as well as efforts to create an enabling policy and institutional environment, develop agricultural input and output markets, build rural roads and other physical infrastructure necessary for the market access, facilitate rural employment through agribusiness and value added processing of agricultural commodities and build agricultural export capacity and opportunity.

National Agricultural Renewal Year Programme of 2006-07 was planned to deal with soil health enhancement, augmentation of the area under irrigation coupled with efficiency and equity in water use, credit and insurance reform, technology upgradation and dissemination and farmer-centred marketing. Swaminathan (2007) opined that this should be in synergy with other major recent initiatives like the National Rural Employment Guarantee Programme, Bharat Nirman, and the National Rural Health Mission.

2.3 PERCEPTION OF AGRICULTURAL DEVELOPMENT

Imbalance within agriculture and between agriculture and other sectors of the economy is an important source of backward and forward linkages in transmitting technical progress in agriculture to overall economic development (Hirschman, 1959).

Kuznets (1966) concluded that there are three proximate reasons for the poor countries' poverty: their much lower labour productivity in agriculture; their somewhat lower labour productivity outside agriculture; and their larger share of employment in the (agricultural) sector that on average is less productive.

Balisacan (1998) studied the character of agricultural development and policy environment influencing the performance of the rural economy in Philippines and analysed the role of domestic policies directly and indirectly affecting agricultural structures and incentives, particularly market regulations and public investment biases against rural sector. He concluded that growth enhancing policy reforms in recent years have changed the economic environment.

Soyso *et al.* (1999) suggested that investing in agriculture is an important strategy for preventing future wars, humanitarian crises and international inventions.

Adebayo and Idowu (2000) opined that a properly functioning extension service with a positively disposed government policy can help transform agriculture.

Caron and Sabourin (2001) analysed that the best way of implementing agricultural development model is the effective transfer of market oriented modern technologies. Study conducted by Singh *et al* (2001). revealed that it is that highly skewed distribution of land holdings that resulted in uneconomical agriculture in North Eastern states of India.

Jeromi (2001) identified four factors constraining growth in agriculture sector and those are

i) Lack of long term policy
ii) Decline of capital formation in the public sector
iii) Lagging research and development efforts
iv) Over exploitation of natural resources like land and water

He also suggested that proper agricultural policy, making higher investments, developing new varieties of seeds, conserving natural resources and providing incentives to farms shall put the agricultural sector on an ambitious growth curve.

Louwaars (2002) stressed the need of seed supply systems to cater to the needs of different types of farmers. Desai (2002) argued that agricultural and economic development literature spanning the last five decades failed to identify the problem of declining total factor productivity after macro-agricultural reforms and how those policies missed he welfare mission behind it. Sankaran and Rai (2002) opined that promotion of health of soil plant system to be free from economic exploitation under overuse of inputs. Agricultural development based on agrochemical or mechanical innovation requires a thorough understanding of how human and social factors interact with the elements of biophysical domain (Pretty and Uphoff, 2002).

Lack of extensive database appears to be a major constraint for formulation of appropriate strategies in the agriculture and allied sectors in the State (Nair, 2002)

Modern farm practices have a strong positive association with agricultural productivity, while socio economic infrastructure plays a supporting role towards modern farming practices and thus indirectly determines the level of agricultural productivity (Pradhan, 2003). Bachbar *et al.* (2003) opined that changes in government policies, social constraints and environmental factors are the main features contributing to agricultural development. Atul and Hasija (2003) described social marketing as a factor to revamp and recharge agricultural extension system to meet the present world challenges. Transition to organic farming and concomitant incorporation of ecological processes and more flexible production options has allowed local farmers to enhance the sustainability of their farming systems by altering the exchange processes within the socio-ecological system (Carpenter, 2003).

Singh (2003) opined that an integrated watershed approach for natural resource management helps to alleviate drought, moderate impact of floods, prevent soil erosion, improve water availability and increase fuel, fodder and agricultural production on sustained basis. According to Krupnik (2003), industrialization of agriculture has brought a staggering number of ecological, social, cultural and economic side effects. It is possible to trace the crisis as it manifests itself in soil

erosion, pesticide pollution, loss of biodiversity, inequitable social consequences and other environmental and social problems.

Hanus (2004) has proposed an evaluation method for measuring sustainable development in agriculture. Three aggregate and one partial group of indicators are selected for ecological, economic and social dimensions of agricultural system. Farmers participatory diagnostic studies in Haryana, Western Uttar Pradesh, Tarai Region and Eastern Uttar Pradesh have revealed that besides short-run production problems, it is the farmers practices of nutrient mining, unregulated ground water extraction and continued cereal-based cropping patterns which have not only depleted the resources but also deteriorated the quality of resources in the Green Revolution Regions (Sharma, 2004).

Kishore (2004) argued that reduced rate of public capital formation and lack of adequate infrastructure and economic incentives have contributed to economic state in Bihar.

Babayan *et al.* (2004) identified some constraints currently affecting agricultural development and these include inadequate markets, inaccessibility to local and international markets, price instability, poor product quality, inadequate inputs and machinery, absence of long term credit, inadequate research, extension support and poor farmer organization. The main symptoms of agricultural development deficit are falling agricultural production, area, productivity, food insecurity, rising food imports and food and growth in absolute poverty and inequality and environmental problems affecting farming and forestry (Zeller and Johannsen, 2004).

Wang (2004) pointed the need to develop the rural economy, improve the farm competitive ability and increase farmer's income, the speed of agricultural mechanization for boosting agricultural industrialization and modernization. The industrialization of agricultural and concurrent increase in societal concerns on environmental protection, food quality have put the focus on agricultural management and its impact on soil quality (Schjonnin *et al.*, 2004).

The National Commision on Farmers have drawn attention to the knowledge deficit which constraints agricultural productivity. To overcome this, farmers will need effective links to universities and best practices (Swaminathan, 2006).

2.6 MODELS OF AGRICULTURAL DEVELOPMENT

Model is a framework, which indicates how works or activities will have to be performed well.

The static dual economy models emphasised the limited interactions between traditional and modern sectors. Hayami and Ruttan (1971) pointed out that the newer dynamic dual economy models identify agriculture as the traditional sector and industry as the modern sector and attempt to trace the increasing interaction between the two sectors in the process of development. Literature on agricultural development models can be outlined under the following heads:

a) The conservation model
b) The urban industrial impact model
c) The diffusion model
d) The high pay off input models

2.6.1. The conservation model

The conservation model of agricultural development evolved from the advances in crop and livestock husbandry associated with the English agricultural revolution and the concepts of soil exhaustion suggested by the early German soil scientists. Habakkuk (1968) described that the English agricultural revolution as the evolution of an intensive, integrated and crop livestock husbandary system.

The conservation model is concerned with the application of the laws of diminishing returns to agricultural sector with the assumptions that:

- Land for agricultural production is scarce and becoming more so
- Soil exhaustion is possible and action to prevent decreases in yields or to increase land productivity will have only slow effect at best (Getaneh, 2002).

According to Steven and Jabara (1988), this model fails to recognize the contribution of industrially produced inputs in increasing agricultural production as well as the impact of technological changes on the types of the demand for land in agriculture.

2.6.2. The Urban Industrial impact model

Todaro (1969) examined that agricultural development policies based on the urban industrialised model of agricultural development appear to have limited scope in most of the less developed countries where

a) A major problem is that of achieving a satisfactory rate of economic growth in the non-farm economy rather than the geographic distribution of economic activity
b) The technological prerequisites for the rapid agricultural growth in the phase of a constant or expanding agricultural labour force are frequently not available
c) Pathological growth or urban centres resulting from population pressures in rural areas frequently runs ahead of growth in the demand for non-farmer workers

The urban Industrial impact model was formulated to explain geographic variations in the intensity of farming and in the productivity of agricultural labour in an industrialising economy. According to Hayami and Ruttan (1971), the policy implications of this model appeared to be the most relevant for the less developed regions of the highly

industrialised countries. In these areas, agricultural development can be accelerated by either increased industrial decentralisation or migration of surplus agricultural workers to more distant urban industrialised centres. They also opined that urban industrial development was beginning to exert a differential impact on labour productivity in agriculture by facilitating the flow of capital into and the flow of labour out of agriculture.

According to Steven and Jabara (1988), the determinant factor of productivity and development in agriculture to be the distance and cost of transporting agricultural products to the urban market, i.e. bulky and perishables tend to be near urban and industrial areas while the less perishables tend to be produced far away on lower cost land.

2.6.3. The diffusion model

The diffusion model approach rests on the empirical observation of substantial differences in land and/ or labour productivity among farmers in any agricultural region, from the most advanced to the more backward. The route to agricultural development is, in this view, through more effective dissemination of technical knowledge and narrowing of dispersion in productivity among individual farmers and among regions. The diffusion model has provided the major intellectual foundation for much of research and extension effort in farm management and production economics since the emergence in the last half of the 19^{th} century, of agricultural economics as a separate sub discipline linking the agricultural sciences and economics (Hayami and Ruttan, 1971).

Steven and Jabara (1988) summarized limitations of the diffusion model that traditional farmers have good knowledge of available traditional technology and are effective allocators of their resources. Secondly, there has often been little new agricultural technology available in LDCs that would be productive if diffused. Third, extension personnel have often not been well trained and thus they have not been able to successfully transfer to farmers the available useful knowledge. Fourth, these extension agents have generally lacked detailed personal knowledge of agricultural and social conditions in the

areas they were supposed to improve, as they have often been outsiders, government appoints from urban or other parts of the nation.

2.6.4. The high pay-off model

Schultz (1964) added that there are very few reproducible agricultural factors in technically advanced countries that are ready-made for the poorest communities. In general, what is available is a body of useful knowledge which has made it possible for the advanced countries to produce for their own use factors that are technically superior to those employed elsewhere. Hopper (1965) explained that in the high pay-off model, agriculture technology is highly location specific and techniques developed in advanced countries are not, in most cases, directly transferable to less developed countries with different climates and different resource endowments.

Getaneh (2002) observed that, transformation of traditional agriculture was undertaken by investments aimed at increasing the availability and supply of modern high pay off inputs to farming activities in this model.

2.6.5. Frontier model

According to Angersen (1994), the frontier model is based on the assumption that land is physically infinite had it not been for transportation costs and problem of accessibility. In his model, transport cost and accessibility play a crucial role in determining the land rent and the agricultural frontier, and thereby land area under cultivation. In this approach, land is assumed to be homogeneous and differ only by the location as measured by distance from a centre (Village). Thus, land is assumed physically infinite. There is, however, scarcity of good land that is land close to the centre (land with low distance cost).

2.6.6. The induced innovation model

Hayami and Ruttan (1985) proposed a theory of induced technology and institutional innovations in agriculture by which they tried to overcome the limited knowledge provided by their predecessors as to how agricultural production could be accelerated. They developed the model by considering technical changes as endogenous factors of development process in which technological change is considered as a dynamic response to changes in resource endowments and to growth in demand.

In depicting this model, Steven and Jabara (1988) indicated four interacting elements: resource endowments, cultural endowments, technology and institutions. Any change in any of these elements due to changed supply or demand conditions could induce changes in any other. The induced innovation hypothesis has been the dominant paradigms used for analyzing the invention and diffusion of new agricultural technologies and linkages between the agricultural and non agricultural technologies. According to the studies of Olmstead and Rhode (2006) on United States, demonstrated that this model suffer from serious conceptual problems.

2.6.7. The Cultural Change First Model

It is a model that stresses the importance of significant social and cultural changes as prerequisite for rapid agricultural growth. In this model, development is a function of cultural values, institutions and technology. According to Hoselitze (1960), it is suggested that for LDCs to become developed, these countries must change their traditional institution first.

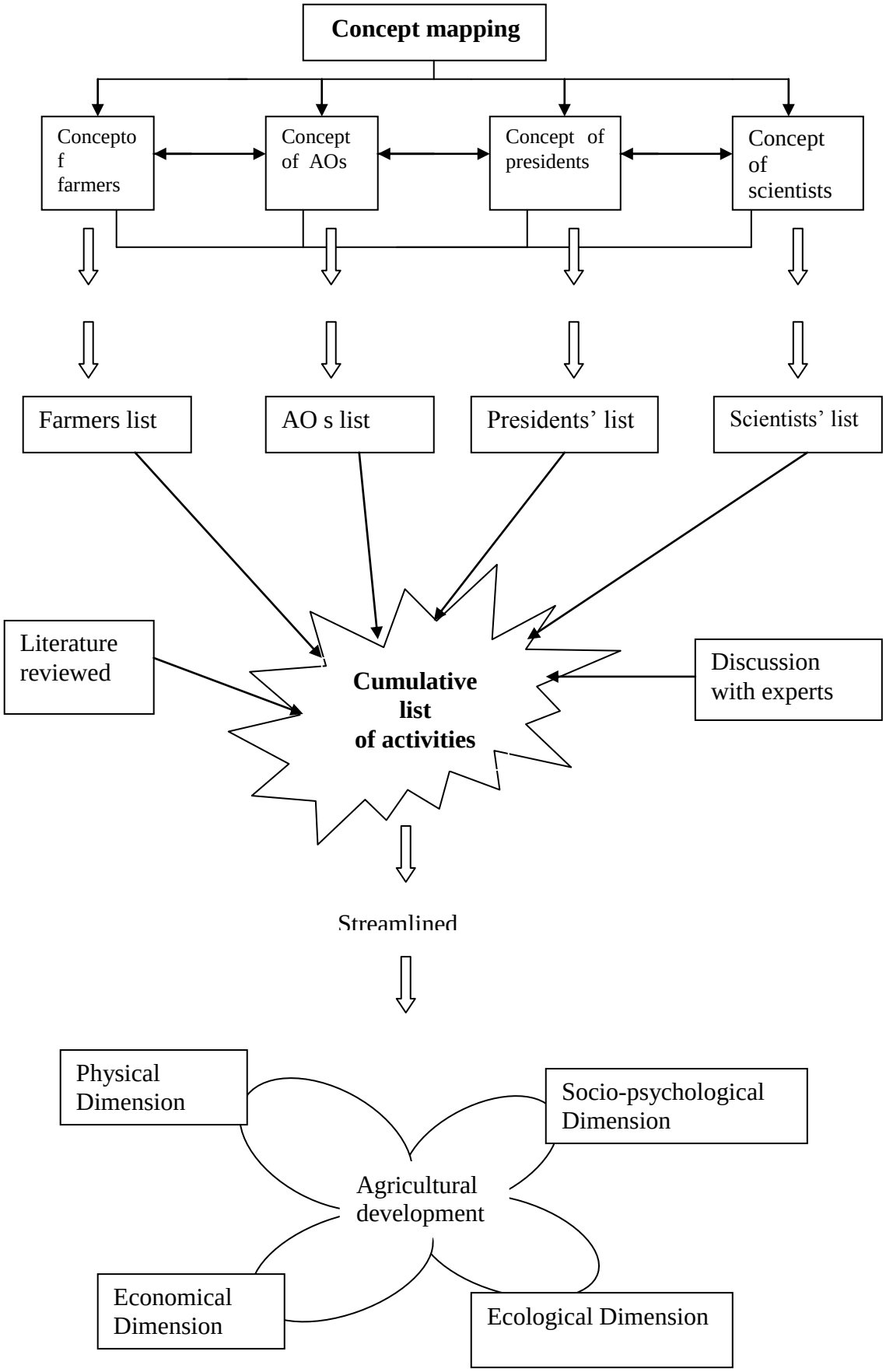
Hagen (1962) pointed out that value orientation of traditional societies have to become universalistic and achievement oriented before rapid growth could be achieved.

Elder (1968) related this model to the phenomenon traditionalism which in turn is seen as interrelated collection of social institutions and cultural beliefs that blocked the path of progress.

2.6.8 Threshold Model

According to Olmstead and Rhode (2006), threshold model is the standard tool for analyzing the timing and extent of technological diffusion and are more modest in concentrating on short-run cost calculations.

Figure 2.1 **Conceptual framework**



METHODOLOGY

3. METHODOLOGY

This chapter deals with the brief description of the methods and procedures followed in conducting the research study, which are presented under the following sub-heads.

3.1 Research design

3.2 Locale of the study

3.3 Selection of respondents

3.4 Measuring perception of agricultural development by different respondent groups

3.5 Generating list of activities under agricultural development as identified by different respondent groups

3.6 Ranking activities of agricultural development under various dimensions

3.7 Preparing model for agricultural development

3.8 Procedure employed for data collection

3.9 Statistical tools used for the study

3.1. RESEARCH DESIGN

The present study was conducted by adopting an 'ex-post facto' research design. According to Kerlinger (1983), ex post facto research is 'systematic empirical enquiry in which scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulatable'.

Based on the analysis of available literature and keeping in view with the objectives of the study, it could be well inferred that most of the attributes included in the study were ex post facto in nature and offer little chance to be manipulated by the researcher. Therefore, ex post facto research design was considered appropriate.

3.2. LOCALE OF THE STUDY

The nature of the study demands an in-depth analysis rather than in spread. Out of the fourteen districts of Kerala, Thrissur was purposefully selected as the study area. Presence of College of Horticulture, many agricultural research stations, training and extension centres under Kerala Agricultural University and different agro-ecological zones made the selection of this district appropriate for the study.

3.3. SELECTION OF SAMPLE

For drawing a representative sample size of 120, equal number of respondents were selected from four different categories, viz., progressive farmers, elected heads of local administrative bodies, agricultural extension officers of the department and agricultural scientists of KAU.

Thirty progressive farmers were chosen from randomly selected Panchayats of the district. Most of the farmers belonged to different farmer groups.

Agricultural officers, the key extension officers of agriculture department, were selected from five random blocks. The blocks thus chosen for this purpose were Mullassery, Wadakkanchery, Chavakkad, Chowannur and Ollukkara.

The selection of thirty respondents representing elected heads of local bodies were done in a similar manner. Panchayat presidents were chosen for this study from Panchayats falling under blocks of Mullassery, Wadakkanchery, Chavakkad, Chowannur and Ollukkara.

Agricultural scientists were randomly selected from College of Horticulture, different agriculture research stations, training and extension centres under KAU to represent the fourth category of the sample.

3.4. MEASURING PERCEPTION OF AGRICULTURAL DEVELOPMENT BY DIFFERENT RESPONDENT GROUPS

3.4.1. Formulation of open ended question

Qualitative text data in the form of brief, open ended survey responses are elicited in organizational research to gather new information about an experience or topic, to explain or clarify quantitative findings and to explore different dimensions of respondents' experiences (Sproull, 1988). According to Erickson and Kaplan (2000), open-ended questions can also capture diversity in responses and provide alternative explanations to those that closed ended survey questions are able to capture. Miles and Huberman (1994) opined that open-ended questions are used in organizational research to explore, explain or reconfirm existing ideas. The open ended question posed in this study was intended to study the differences in understanding the concept of agricultural development.

The focal question structured for this purpose was as follows:

Based on your knowledge and experience over the years and as a stakeholder in the process of development, how would you define agricultural development?

All the respondents belonging to the four different categories were given the same question.

3.4.2 Assigning scores to open ended responses

The open ended responses collected from different respondent groups were assigned scores on the basis of a previously identified definition which was

found suitable for the present study as per experts' opinion. The definition identified is given below:

Agriculture development includes natural resources management and many other activities that contribute to improved productivity on the farm as well as efforts to create an enabling policy and institutional environment, develop agricultural input and output markets, build rural roads and other physical infrastructure necessary for the market access, facilitate rural employment through agribusiness and value added processing of agricultural commodities and build agricultural export capacity and opportunity.

The responses were then scored out of ten based on the ten idea points identified in the above mentioned definition of agricultural development as given below:

1. Natural resources management
2. Activities that contribute to improved productivity on the farm
3. Efforts to create an enabling policy and institutional environment
4. Develop agricultural input and output markets
5. Build rural roads and other physical infrastructure
6. Market access
7. Facilitate rural employment through agribusiness
8. Value added processing of agricultural commodities
9. Agricultural export capacity
10. Opportunity

3.4.3 Comparison of mean scores between various respondent groups

The mean score of the four individual respondent groups were calculated and were compared with each other.

3.4.4 Mapping the concept of agricultural development as perceived by different respondent groups

3.4.4.1 Mapping the concept

Open-ended survey responses are extremely useful in explaining organizational issues. This type of text contains narrative characteristics of longer text documents and 'free list-in context' type of texts. But quantifying a qualitative data has always been interesting as well as a challenging task.

Ryan and Bernard (2000) suggested that for analyzing free flowing text there are two broad methodological approaches namely, word based and code based methodologies. In the word based analysis method, words are used as units of analysis. It is applied in organizational research primarily in inductive qualitative studies allowing data structure to emerge or validate a thematic content analysis (Jehn, 1995). Carley and Kaufer (1993) opined that this method make use of natural meaning embedded in language structures to represent meaning in sparse type of text. These methods typically employ computer assisted coding, which has the advantages of less time consuming automation and improved reliability of coding. Shapiro (1997) pointed out that one of the disadvantages of word based method is that it does not add an understanding or explanation of the word unit in its social or psychological context.

Code based analysis or thematic coding methods are often used for reducing text data into manageable summary categories or themes for making inference about a sample (Weber, 1990). This method is used with denser types of text, such as in depth interview transcripts in which richer text can lead to the identification of recurring themes or metaphors. Criticisms of this method, according to Kelle and Laurie (1998), are that it relies on researcher driven classification and allows interdependence between coders.

Concept mapping is particularly suitable for open-ended survey text because it combines the strength of word based and code based methodologies while mitigating some of their weaknesses. Jackson and Trochim (2002) explained that concept mapping is similar to word based approaches in that it allows for visual representation of conceptual similarities through statistical mapping but differs in that that it retains context by using intact respondent statements as unit of analysis instead of words. It is similar to code based approaches because it allows human judgment to cluster these similarities thematically, but different that it uses statistical analysis based on respondent judgments as a basis for those decisions. By blending the strength of existing text analysis techniques and coupling those with the use of advanced multivariate statistical methods, concept mapping offers researchers a way to code and represent meaning in the text data based on respondent input with considerable savings in analysis time and improvement in analytical rigour. Hence concept mapping was adopted for the purpose of this study as it suited the best.

The idea of concept map was developed by Joseph D. Novak in 1972 as a part of a research programme that intended to identify specific changes in children's understanding of science concepts by examining interview transcripts. Novak and Canas (2006) explained that out of the necessity to find a better way to represent children's conceptual understanding, emerged the idea of representing children's knowledge in the form of a concept map. Thus was born a new tool not only for the use in research but also for many purposes.

Concept mapping is a method particularly useful for helping social science researchers enabling them to interpret qualitative data systematically. Trochim and Linton (1986) elaborated that concept mapping is a type of structured conceptualization that can be used by groups to develop a conceptual framework that can guide evaluation or planning. The term 'structured conceptualization' refers to any process which can be described as a sequence of concrete, operationally defined steps and which yields a conceptual representation.

Jackson and Trochim (2002) defined concept mapping as a type of participatory text analysis that directly involves respondents or their proxies in the coding of the text. It is a multi-step, hybrid method that uses original intact respondent statements as units of analysis, solicits the actual survey respondents or respondent proxies who use pile sorting to code the data, aggregate quantitatively across individual conceptual schemes and enables the data structure to emerge through the use of multidimensional scaling and cluster analysis of the aggregated individual coding data.

Concept mapping tools empower experts to play an active role in the knowledge capture process and enable to build knowledge models with interconnected sets of linked concept maps and resources of the domain (Jayakumar and Barua, 2007). As a knowledge capture method, concept mapping is appealing for its elegant cognitive pattern enabling better comprehension.

There are several specific methodologies that share the name concept mapping but having considerable difference in the methodology adopted and the results generated. Novak and Gowin (1997) opined that one form of concept mapping widely used in education is essentially an informal process whereby an individual draws a picture of all the ideas related to some general theme or question and shows how these are related. The resulting map usually has each idea in a separate box with lines connecting related ideas and labeled with connective terms like leads to, results from, is a part of *etc.*

Another form of concept mapping (Trochim, 1989) is a more formal group process tool that includes a sequence of structured group activities linked to a series of multivariate statistical analysis that process the group input and generate maps. Instead of representing the mental models of individual respondents, it depicts an aggregate representation of the text in the form of thematic clusters as generated by respondents. It is this form of group oriented concept mapping that was utilized for the present study.

Concept mapping process involves six steps: (Figure 3.1)

1) Preparation (including selection of participants and development of focus for the conceptualization)
2) Generation of statements
3) Structuring of statements
4) Representation of Statements in the form of a concept map (using multidimensional scaling and cluster analysis)
5) Interpretation of maps
6) Utilization of Maps

A detailed description of the steps involved in the process of mapping is given below.

3.4.1.1 Preparation

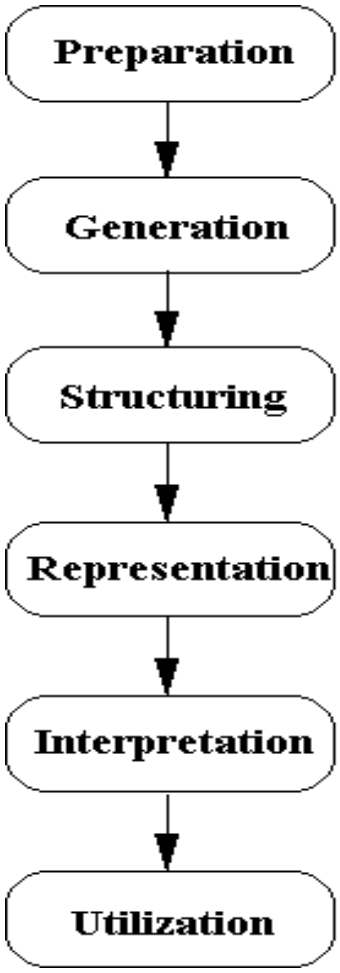
The focal question required for initiating the process of mapping was carefully formulated after discussing with experts. The open ended question was formulated to elicit free list-in type of responses.

3.4.1.2 Generation of Statements

After the participants and focus statements were defined, the actual concept mapping process began with the generation of a set of statements which ideally should represent the entire conceptual domain for the topic of interest. It was done to create units of analysis. A unit of analysis consisted of a sentence or a phrase containing a single idea. Unitising was done to retain the context of each concept and making it readily available for the sorters. Each answer was thus broken down into separate statements by the researcher.

This procedure was done separately with the data collected from the four categories of respondents. The number of statements pooled out of each group

Figure 3.1. The six steps in the concept mapping process.



varied. It was 91 statements from the category of Panchayat presidents, 90 from farmers, 81 from agricultural officers and 60 from agricultural scientists.

3.4.1.3 Structuring of Statements

The statements obtained furnished information about the inter relationships using a card sorting procedure. Each of the statements was printed on separate 3'x5' cards. These statement embossed cards were given to different sorters and instructed to code these units into piles of similar statements. Sorters were asked to put each card in a pile with other cards that contained similar statements. There was no limit of the number of piles that could be created and the only limitation put before sorters was that there should not be a miscellaneous pile. Each sorter was instructed to name each pile of statement printed cards that best represented the statements in it. The statements pooled from the cumulative concepts of each respondent group were sorted and piled by five individual sorters, thus making a total of 20 sorts.

3.4.1.4 Representing of Statements

There were four steps involved to represent the conceptual domain.

1) Creating individual matrix

An individual matrix with as many rows and columns as there were statements was created for each sorter. All of these values in these matrices were either '1' or '0'. '1' indicated that the statements for that row and column were placed by that sorter together in a pile while '0' indicated that it was not. An example of a hypothetical sort with ten statements is shown in figure 3.2. Five individual matrices were created for each of the four respondent groups.

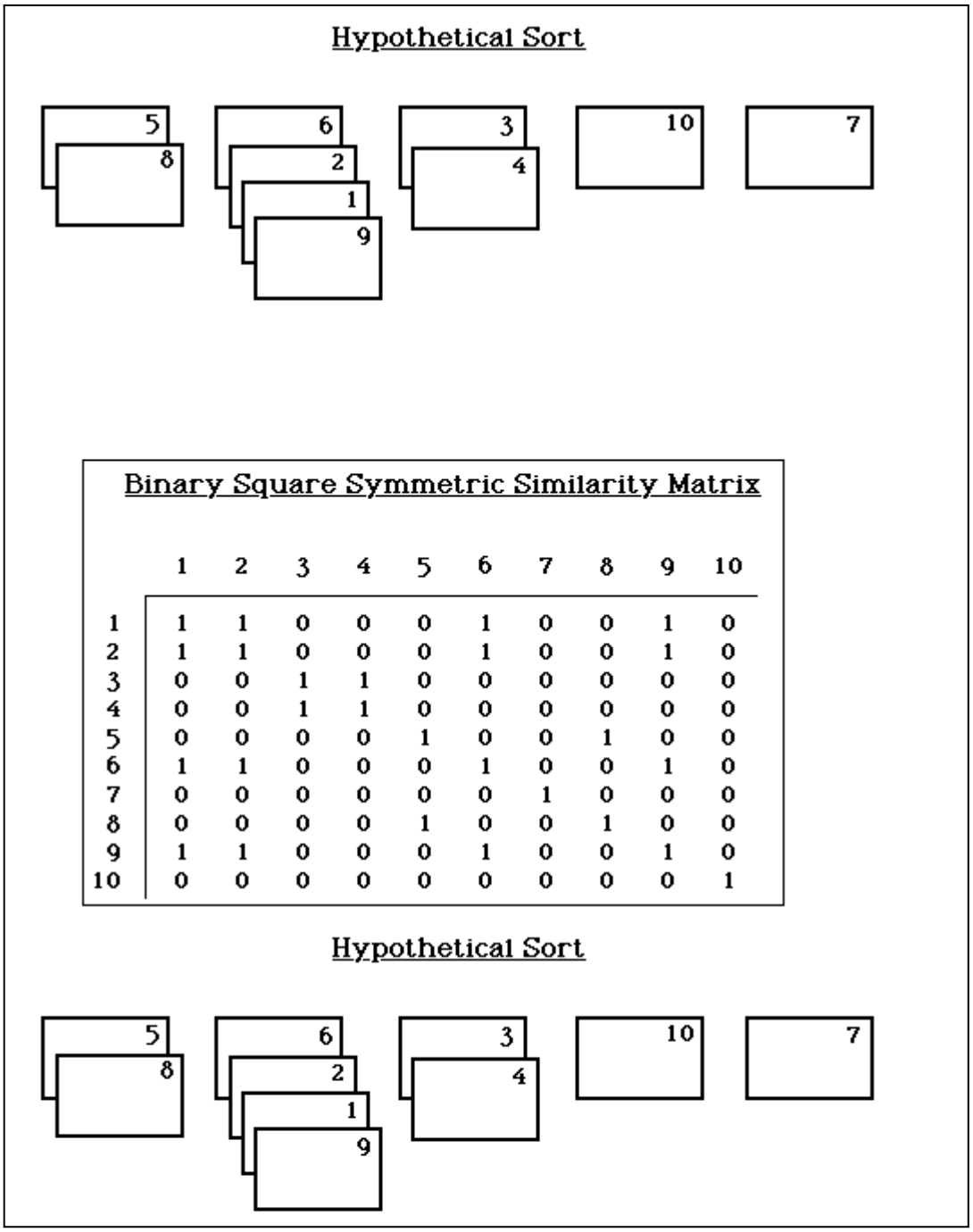


Figure 3.2

Binary Square Symmetric Similarity Matrix

	1	2	3	4	5	6	7	8	9	10
1	1	1	0	0	0	1	0	0	1	0
2	1	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	0	0
4	0	0	1	1	0	0	0	0	0	0
5	0	0	0	0	1	0	0	1	0	0
6	1	1	0	0	0	1	0	0	1	0
7	0	0	0	0	0	0	1	0	0	0

2) Creating aggregated matrix

The individual sort matrices were added together to obtain a combined group similarity matrix. The value in the matrix for any pair of statements indicated the number of people that placed particular pair of statements together. Values along the diagonal must be equal to the number of people who sorted. Four aggregated matrices were thus prepared representing the concepts of the four different categories of respondents.

2) Preparing point map

The four aggregated matrices were subjected to multidimensional scaling (MDS). Torgerson proposed the first MDS method and coined the term. MDS has its origins in psychometrics where it was proposed to understand people's judgments of the similarity of members of a set of objects (Torgerson, 1952).

Multidimensional scaling (MDS) is a set of related statistical techniques often used in data visualisation for exploring similarities or dissimilarities in data. An MDS algorithm starts with a matrix of item-item similarities, then assigns a location of each item in a low-dimensional space, suitable for graphing or 3D visualisation (Borg and Groenen, 1997). The dimensions were limited to two because, as Kruskal and Wish (1978) pointed out, it is generally easier to work with two-dimensional configurations than with those involving more dimensions. MDS generated coordinate estimates and a two dimensional map of distances between statements based on the aggregate sorts of the five coders. Each statement on the map was represented by a point accompanied by a statement number. The number of points on the map will be equal to the number of statements. Repetitive statements were discarded from the primary statement list to ensure clarity of mapping.

The distance between the points represented coordinate estimates from MDS of how similar the statements were judged by the sorters. Statements judged to be similar to each other were positioned closer to each other on the map. The position of each point on the map (bottom, top or sides) from the origin carried no significance in interpreting the data.

3) Preparing cluster map

The point maps obtained after MDS were subjected to cluster analysis. Hierarchial agglomerative cluster analysis using Ward's algorithm was used to determine how the statements cluster together based on similarity. Ward's algorithm can be applied to cluster any data set for which a distance or similarity measure is available (Ward, 1963). According to Afifi and Clark (1996), this type of cluster analysis is most helpful in identifying categories when the structure of categories is not already known.

Final clustering was executed by the researcher herself as there was no plausible mathematical criterion that could be used to select the number of clusters. It was identified based on the level of specificity desired and the context of mapping. The clusters were assigned names that fairly represented the contents of statements held in it.

3.4.1.5 Interpreting maps

Interpreting conceptualization involved a sequential approach with a specific set of tools. The different tools used are as follows:

i) Statement list

It contained the reduced list of statements with an identifying number. Statement list for panchayat presidents contained 91 statements, 90 for farmers, 81 for agricultural officers and 60 for agricultural scientists.

ii) Cluster list

Lists of statements as they were grouped into clusters after cluster analysis were furnished. Four separate cluster lists were prepared.

iii) Point map

This map displayed the numbered statements as points as they were placed by multi dimensional scaling.

iv) Cluster map

The cluster map showed how statements were grouped after cluster analysis. The final cluster map constituted the conceptual frame work evolved out of concept mapping. Four individual concept maps representing the conceptual domain of the four respondent groups were prepared.

3.4.5.6. The utilization of maps

The four final cluster maps were interpreted to study the differences in perception among the different respondent categories. The clusters representing different zones in the conceptual framework and how conceptual subsets linked with one another were illustrated.

3.5 GENERATING LIST OF ACTIVITIES UNDER AGRICULTURAL DEVELOPMENT AS IDENTIFIED BY DIFFERENT RESPONDENT GROUPS

An exhaustive list of activities identified under agricultural development by different respondent groups were enlisted separately. After deleting seemingly illogical and redundant statements there were 448 activities identified by

scientists, 342 by Panchayat presidents, 287 by farmers and 232 activities by agricultural officers.

3.5.1 Calculating frequencies of activities identified under agricultural development

The frequency of each activity identified by individual respondents was calculated. A cumulative list of the agricultural development activities was prepared based on individual responses recorded in each category. Hence, four cumulative lists of agricultural development activities were prepared and frequency of each activity in the respective group was calculated. This list served as a substratum for preparing final schedule of ranking.

3.5.2 Calculating percentages of activities identified under agricultural development

The percentage of each activity identified by individual respondent was calculated. This conveyed how each activity was considered relevant by respective respondent groups when compared to others.

3.6 RANKING ACTIVITIES OF AGRICULTURAL DEVELOPMENT UNDER VARIOUS DIMENSIONS

A ranking schedule was prepared which contained four distinct lists of agricultural development activities under four dimensions namely, physical dimension, economic dimension, ecological dimension and socio-psychological dimension. It was prepared after reviewing available literature, discussing with agricultural experts and gathering insights from the views of respondents.

3.6.1 Calculating rank value for each activity under each dimension

Out of the 34 activities listed in the final schedule, fourteen agricultural development activities were grouped under the physical dimension of agricultural

development. The different activities listed in this section catered to the infrastructural and other structured activity profile of agriculture development. In the sub section, ecological dimension of agricultural development, five agricultural development activities covering ecological aspects were included. Nine activities were finally sorted under economic dimension. The number of activities under socio-psychological dimension of agricultural development was six.

Each respondent was asked to rank the activities in such a manner that the activity considered to be of highest importance should be given rank 1, the next important activity with rank 2 and so on. The last rank attributed shall be equal to the number of statements under each dimension.

Rank value was calculated for each activity under each dimension using the formula

$$\frac{\sum r_i \ (n' - 1)}{N}$$

where r_i = Number of persons responded to i^{th} statement,
N= Number of respondents, n' = (Number of statements +1)

Higher the score higher the rank value of the statement. The activities were ranked and arranged based on the calculated rank values.

3.6.2 Comparing rank values under each dimension between the four respondent groups

The comparison was done using Kruskal- Wallis test. It was revealed from the analysis how each respondent group comparatively ranked different statements.

Calculating rank value for each respective respondent group

Cumulative rank values under each dimension for different respondent groups were calculated.

3.7. PREPARING MODEL FOR AGRICULTURAL DEVELOPMENT

On the basis of rank values computed, the activities with highest ranks were picked from each dimension by different respondents to prepare a final model for agricultural development.

3.8. PROCEDURE EMPLOYED FOR DATA COLLECTION

The data was collected for the study in four steps which is given below.

Step 1: Preliminary data collection

Primary search for literature pertaining to the study revealed the dearth of available descriptive research in this line justifying shortage of pertinent research findings.

Step 2: Pilot study

A draft schedule was prepared and pretested by conducting a pilot study in a non sample area and responses were recorded. This helped in refining the schedule to elicit the type of responses that helped the study.

Step 3: Interview schedule

An interview schedule was prepared for collecting responses from various groups of respondents, namely, progressive farmers, agricultural officers, elected

heads of local governing bodies and agricultural scientists. The schedule contained two parts. The first part began with an open ended question which gave ample space for the respondents to record their perception on agricultural development. Mapping of the concepts of each group was conducted utilizing the tool of concept mapping to study the gaps in perception.

The second part of the schedule contained a 'list out' question. Respondents were thus given an opportunity to list out the different agricultural development activities. Responses generated were analogous to individual brainstorming around the topic. An exhaustive list of agricultural development activities was prepared after compiling the data collected from the schedule and discussing with experts.

Step 4: Ranking schedule

The compiled list of agricultural development activities generated after conducting survey was classified into four dimensions making use of the concept mapping tool. Repetitive and similar activities were deleted to ensure distinction of one activity from another. Some of the activities were clubbed together to generate comprehensive ones. A ranking schedule with four sub-sections was presented to the four categories of respondents. Both the interview and ranking schedules were administered to the same sample. Weighted ranking was conducted and the final model of development was developed on this basis.

3.9. STATISTICAL TOOLS USED FOR THE STUDY

3.9.1 Multidimensional scaling

Multidimensional scaling (MDS) is a set of related statistical techniques often used in data visualisation for exploring similarities or dissimilarities in data. An MDS algorithm starts with a matrix of item-item similarities, then assigns a

location of each item in a low-dimensional space, suitable for graphing or 3D visualisation (Borg and Groenen, 1997).

3.9.2 Kruskal-Wallis test

Kruskal-Wallis compares between the medians of two or more samples to determine if the samples have come from different populations.

3.9.3 Percentage analysis

Percentage analysis was employed to statistically represent the number of activities listed by each respondent group.

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RESULTS AND DISCUSSION

4. RESULTS AND DISCUSSION

An attempt was made in this study to elucidate the differences in perception of agricultural development by progressive farmers, panchayat presidents, agricultural officers and agricultural scientists. A model for agricultural development was constructed making use of the cumulative concepts of the four respondent groups. This chapter highlights the salient findings of the present study entitled "Reorienting the concept of agricultural development in the present context of Kerala". The results are presented and discussed under the following headings in the light of the objectives set forth for the study.

4.1. Perception of agricultural development by different respondent groups
4.2. List of activities streamlined by different respondent groups
4.3. Comparison of rank values under each dimension
4.4. Comparison of rank values between respondent groups
4.5. Model for agricultural development

4.1. PERCEPTION OF AGRICULTURAL DEVELOPMENT BY DIFFERENT RESPONDENT GROUPS

4.1.1. Analysis of responses of open ended questions

Table 4.1 Comparison of percentage mean scores between various respondent groups

Respondent group	**Mean score (Percentage)**
Scientists	75.00
Agricultural officers	50.00
Panchayat presidents	41.00
Farmers	36.30

The responses obtained from open ended question varied. Some responses were comprehensive definitions whereas some responses included listing of agricultural activities that promoted development. These responses were critically analysed against a previously identified definition of agricultural development for the purpose of the present study. The responses were allotted scores out of ten on comparing with the points mentioned in the above definition. For the ease of comparison, the scores were expressed in terms of percentages. Mean scores obtained by each respondent group were calculated to study the difference in perception of agricultural development between the respondent groups.

It can be inferred from the above table that the extent of perception difference among the four respondent groups regarding the concept of agricultural development was significant.

Scientists being in the field of research have wide opportunities for the renewal and upgradation of their knowledge base and hence stood different from the rest of the respondent groups. It is qualitative of scientists to express comprehensive ideas of concepts with which they constantly deal with. The comprehensiveness and comformity of the responses to the previously identified definition served as a base for better scoring of 75 percent when compared with other respondent groups. Agricultural scientists are entrusted to think for the whole farming community and hence significance of lack in clarity of concept (25 %) is profound.

Agricultural officers obtained a mean score of 50 percent which showed that remaining 50 per cent of the concept lacks clarity. Agricultural officers who serve as prime extension personnel mostly thought in terms of action than concepts. This respondent group is mostly entitled to be problem solvers of the local farming society and the solutions that emerge intended to address a smaller community justifying the lack of conceptual clarity.

Panchayat presidents, who are in the process of awakening due to the incessant trainings being imparted to them on a regular basis, scored 41 percent. Being the major facilitators of development in the present decentralised set up, the extent of negligence of panchayat presidents (59 %) towards the concept of agricultural development was undesirable.

The farmer respondent group bagged a score of 36.3 per cent. The thought process of farmers mostly go around him and his family whereas panchayat presidents who are in an accountable position have to think for a larger community and that accounted to the considerable difference in the scores. Farmers' prime importance of agricultural development was dependent on the extent of production of agricultural produce so that more profit can be gained. Their lack of awareness about other spheres of agricultural development has distorted their perceptions.

4.1.2. Mapping the concept of agricultural development by respondent groups

Concepts of agricultural development perceived by the four groups of respondents, namely, progressive farmers, panchayat presidents, agricultural officers and agricultural scientists was mapped. The major tools assisting the interpretation of concept maps were statement lists, point maps and cluster lists. The statement lists contained the statements pooled from the responses of open ended questions. After systematic binary sorting of these statements, point maps were constructed utilising multidimensional scaling of the statements. Final clustering of the points (statements indicated as numbers) were identified and named appropriately. It was furnished in cluster maps of respective respondent groups.

All the clusters derived were coloured differently for clear expression of spatial alignment of the perception patterns. The colourful concept maps

constructed were analysed to identify how clustering has taken place around specific zones. The delineated maps gave vivid picture of concepts mapped in the study.

The clusters identified in the maps were delineated into four zones indicating divergence in thinking. The zones delineated were named as production related concept, eco-concerning concept, marketing and financial assistance concept, and socio-concerning concept.

4.1.2.1 Concept map of farmers

Concept map of progressive farmers (figure 4.2) presented the visual representation of farmers' perceptions of agricultural development. Cluster list of statements (table 4.2) and point map (figure 4.1) was obtained after conducting multi dimensional analysis and final clustering of the statement points (statements indicated with numbered points). Point map was transformed into concept map with well identified and grouped clusters.

Nine different clusters of varying shape and size was figured out in the map. The polygonal shape of the clusters was due to the interpolation of different points emerged out of the point map.

Interpretation of the map was done on the basis of the polarization and is covered by different clusters. The different clusters identified were input availability, production oriented activities, organic farming, watershed planning, conserving ecology, financial assistance, procurement and pricing, export oriented and social status.

The two clusters identified under production related conceptual focal area, namely, input availability and production oriented activities, occupied major area

Table 4.2 Cluster list of statements of farmers

Cluster name	Statement Number	Statement
Technological intervention	1	Tissue culture
	7	Traditional and scientific farming
	20	Soil testing
	23	Increased production
	28	New scientific practices
	30	Improved machinery
	50	Rice, coconut, rubber and banana based cultivation
	53	Self sufficiency of farmer
	59	Increased food grain production
	62	Improved productivity
	67	More food grain production
	73	Better scientific farming
	75	Expert advisory group
	79	Conventional and scientific farming
	83	Integrating farming practices
	84	Dissemination of technologies
	43	Improve productivity
Input availability	2	New varieties
	6	New varieties
	9	Subsidised seeds
	26	Improved seeds
	27	Labour availability
	29	Decrease cost of cultivation
	18	Water storage facilities
	33	Improve irrigation facilities
	35	Irrigation facility
	38	Decrease labour cost
	42	Construct check dams
	54	Good soil, water and land
	74	Timely inputs
	85	Availability of planting materials
Watershed planning	68	Watershed programmes
	90	Watershed based planning
	46	Watershed planning
Export oriented	12	Export oriented crop production
	34	Crop production exploiting globalization
	40	Increase per capita income
	44	Food security assurance

Cluster list of statements of farmers (contd)

Cluster name	Statement Number	Statement
Procurement and pricing	3	Fair price
	4	Decrease storage loss
	5	Improve marketing
	8	Better marketing strategy
	13	Assured price
	14	Reasonable pricing
	37	Better price
	39	Cash crop procurement
	71	Assured price
	76	Assured price
	80	Storage facility
Social status	11	Better social status of farmers
	15	Good status in society
	22	Educated youth in farming
	32	Economic and educational growth of farmers
	66	Youth in farming
	51	New generation in farming
Conserving ecology	24	Decrease excessive chemical fertilizers
	31	Barren land into arable land
	45	Barren land utilization
	57	Group farming
	61	Barren land utilization
	64	Utilizing uncultivated land
	70	Soil conservation
	77	Soil and water conservation
	81	Balancing ecology
	41	Soil and water conserving programmes
	88	Prevent paddy field conversions

Cluster list of statements of farmers (contd)

Cluster name	Statement Number	Statement
Organic farming	10	Organic farming
	21	Organic cultivation of vegetables
	25	Use of bio- fertilizers
	36	Use of bio-pesticides
	47	Promote organic farming
	56	Bio-inputs
	60	Organic farming
	63	Biofertilizer availability
	65	Awareness of organic produce
	78	Organic farming
	87	More use of bio-inputs
Financial assistance	48	More subsidy for inputs
	49	Free inputs for low income farmers
	69	More subsidy for crops of high operational cost
	72	Insurance against natural calamities and market upheavals
	89	Increased subsidy for rice farmers

Figure 4.1 Point map of farmers

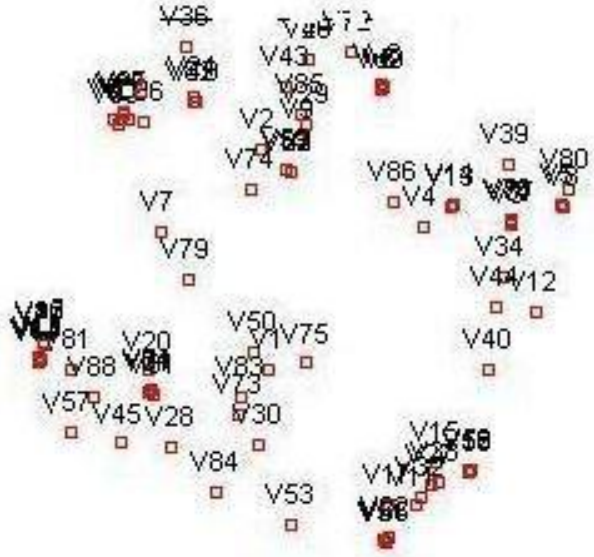
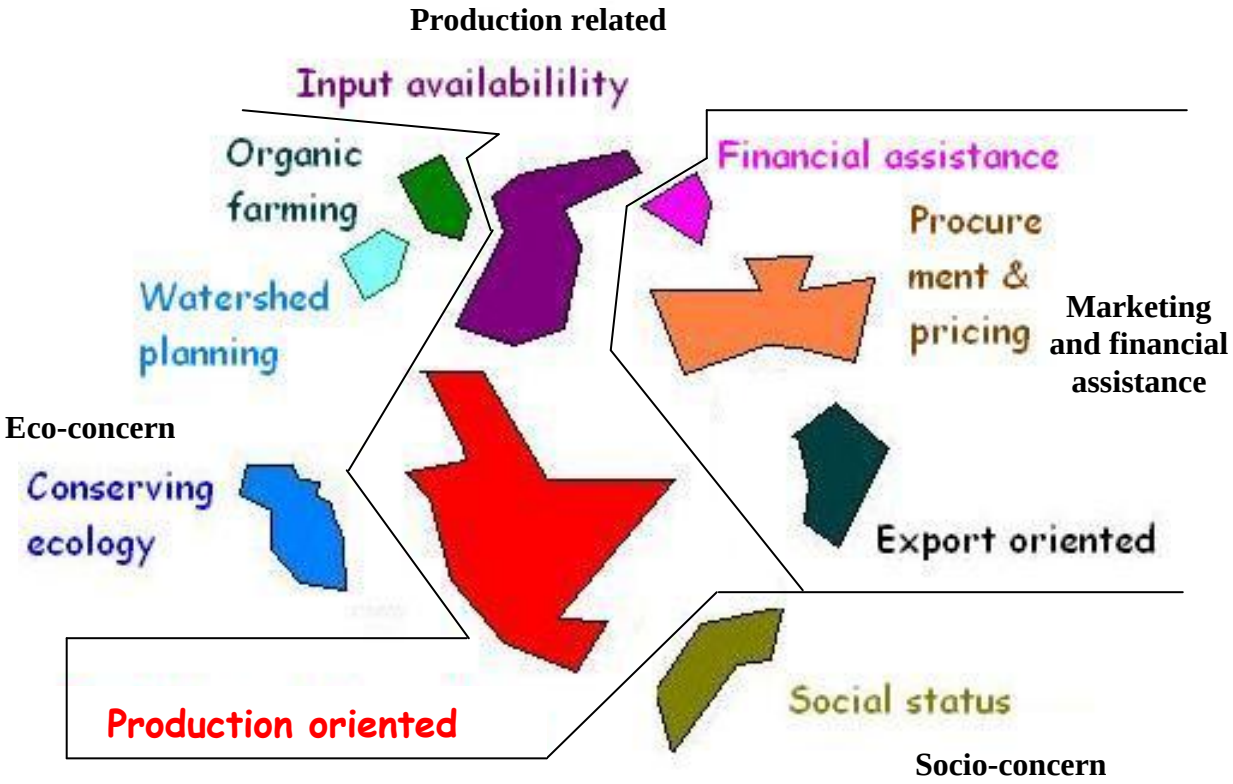
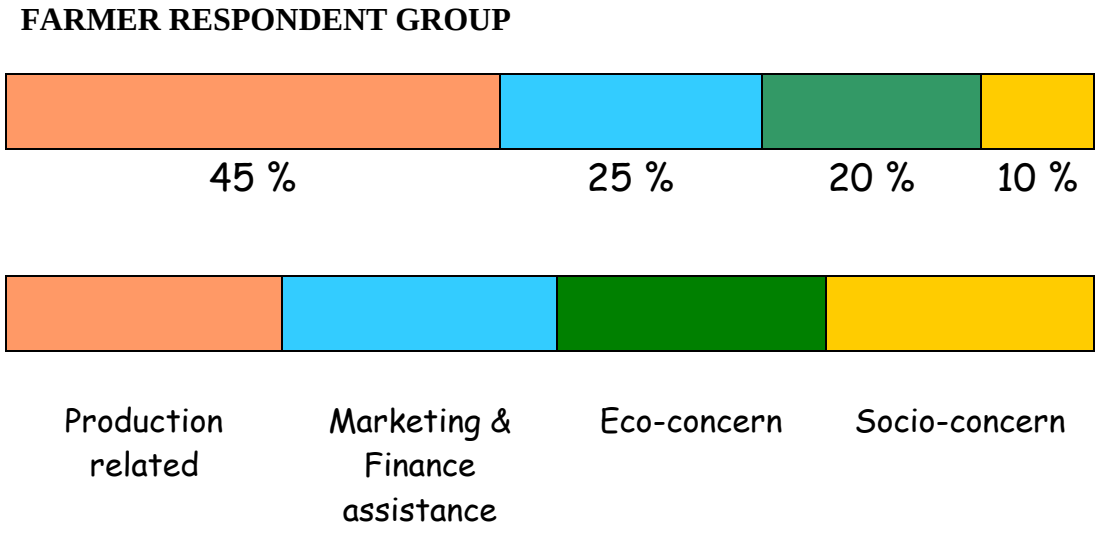


Figure 4.2 Concept map of farmers





in the concept map of progressive farmers. It was followed by ‘marketing and financial assistance’, ‘procurement and pricing’ and ‘export oriented activities’.

The concern of farmers about ecology should be applauded. Clusters identified under eco-concerning focal area of concept were ‘organic farming’, ‘watershed planning’ and ‘conserving ecology’. These clusters occupied third position with respect to the area covered in the map. The sole cluster under socio-concerning focal area was ‘social status’.

The named clusters under production related concept were input availability and production oriented activities. Financial assistance, procurement and pricing, and export oriented activities were the clusters plotted under marketing and financial assistance concept. The eco- concept comprised of three clusters, namely, organic farming, watershed planning and conserving ecology. The cluster social status was the sole representative of socio-concerning concept of progressive farmers.

It was understood that the concept of farmers on agricultural development concentrated mostly on production related activities.

4.1.2.2 Concept map of panchayat presidents

Visually represented map (figure 4.4) of the panchayat president respondent group contained eight different clusters. The grouping of clusters into four conceptual focal area was explicitly identified from the map. It was the production related focal area that covered major area in the map. This indicated the increased focusing of perceptions around production related activities.

It was followed by the socio-concerning conceptual focal area. The three clusters identified were named as ‘motivating farmers’, ‘financial support’ and ‘ export’. The sole cluster under eco-concern was ‘sustainable farming’.

Table 4.3 Cluster list of statements of panchayat presidents

Cluster name	Statement Number	Statement
Motivating farmers	49	From agro-consumerism to agro-production
	4	Encouraging group farming
	8	Expert advice
	11	Undertaking production and marketing as a group
	55	Increase national agricultural income
	64	Improving socio-economic status of farmers
	15	Preventing conditions leading to farmer suicides
Production oriented	65	Increase production
	34	More area under cultivation
	47	Undertaking traditional and scientific farming practices
	68	Utilising surplus produces judiciously
	84	Increase productivity
	85	Plan for area based agricultural production
	39	Considering farming as human obligation
	10	Promoting group farming
	23	Combining new and and conventional farming practices
	38	Producing food for all
	42	Emphasis on cash crops
Sustainable farming	60	Conserving biodiversity
	48	Organic plant protection measures
	87	Farming based on nature of soil and geography
	21	Sustainable farming
	86	Well timed crop management practices
Government intervention	27	Government enforced barren land utilization
	54	Monitoring of agricultural schemes at three tier level of administration
	79	Government initiatives to change attitude towards farming positively
	90	Encourage new generation into farming
Availability of inputs	44	Timely irrigation facilities
	51	Prevent excessive use of chemicals
	22	Protecting biodiversity and groundwater
	2	Availability of timely and quality seeds
	83	Ensure water supply for third crop of rice
	16	Experiment latest production methods

Cluster list of panchayat presidents (contd)

Cluster name	Statement Number	Statement
Financial support	6	Value addition ensuring maximum price to products
	18	Diversification to decrease possible price fluctuation of major produce
	19	Promoting micro agricultural enterprises via farmer groups
	30	Subsidy for crops
	67	Diversification to meet local needs
	74	Subsidized seeds and fertilizers
Social status	71	Increase in per capita income from agriculture and related activities
	72	Social economic growth of farmers
	75	Improve economic status of farmers
	77	Improve standard of living
	68	Utilising surplus food commodities for general welfare of farming community
	80	Improving social concern towards farming
	81	Increasing living status
	56	Increase in per capita income from farming

Figure 4.3 Point map of panchayat presidents

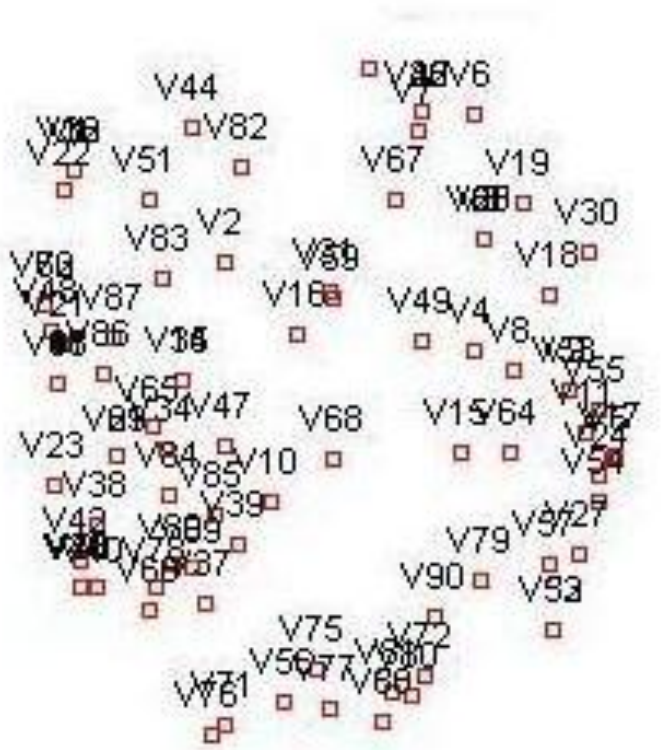
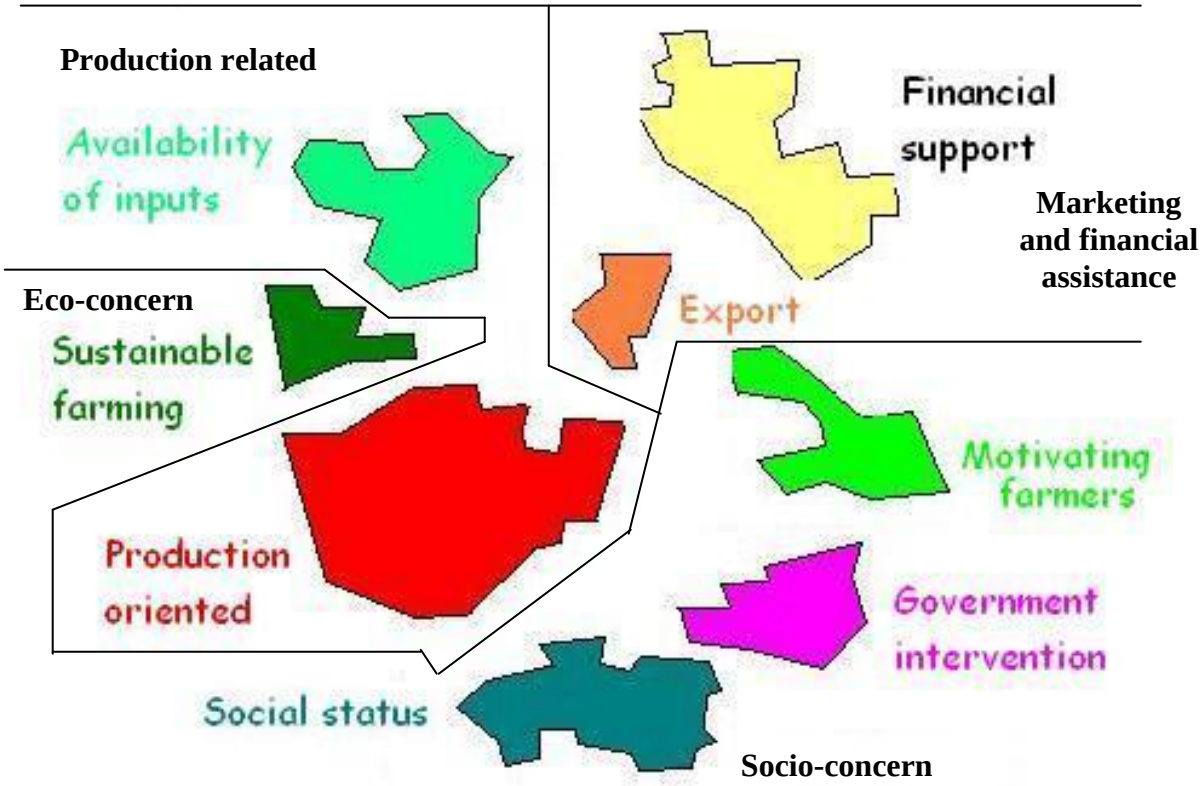
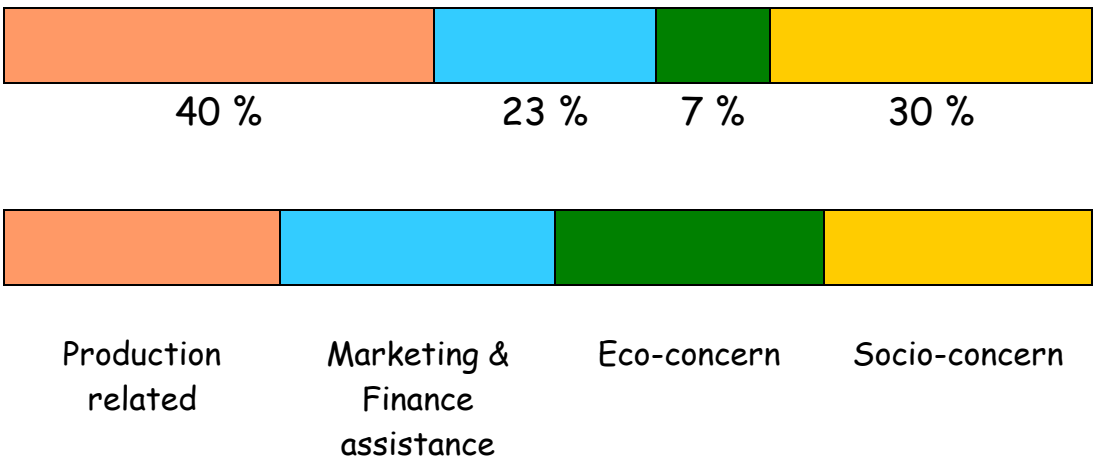


Figure 4.4 Concept map of Panchayat presidents



PANCHAYAT PRESIDENT RESPONDENT GROUP



The cluster list (table 4.3) and point map (figure 4.3) were utilised for the interpretation of the concept map.

4.1.2.3 Concept map of agricultural officers

Concept map of agricultural officers (figure 4.6) was deduced from cluster list of statements (table 4.4) and point map (figure 4.5) prepared for the respondent group based on the perceptions of agricultural officers.

There were nine clusters identified under four conceptual focal areas, namely, production related, marketing and financial support, eco-concerning and socio-concerning. The different clusters along then fore mentioned focal areas were delineated to get a simpler and easily interpretable picture.

It is the socio-concerning concept hat enjoyed major area coverage in the map. The clusters identified under this focal area were ‘social concern’, ‘participatory planning’, ‘youth in farming’ and ‘motivating and integrating farmers’.

4.1.2.4 Concept map of agricultural scientists

Visually illustrated concept map of scientists elaborated the perceptions of agricultural scientists on agricultural development (figure 4.8).

Nine clusters of varying shapes and sizes were delineated and included under different conceptual focal areas based on the proximity of these clusters to each other. The focal area named marketing and financial assistance covered maximum area in the map. The clusters in this focal area were ‘organised marketing’, ‘product diversification’ and ‘financial support’.

Table 4.4 Cluster list of statements of agricultural officers

Cluster name	Statement Number	Statement
Production oriented	9	Increase productivity
	17	Use of farm machinery
	75	Improve soil fertility
	1	Increase productivity
	22	Increase productivity
	16	Hi-tech farming
	32	Increase production of crops
	66	Utilise barren and wasteland
	80	Restoration of agricultural fertility
	26	Self sufficiency in food grain production
	62	Adopting scientific practices
Motivating and integrating farmers	37	Latest information to farmers
	49	Awareness about latest technology in farming
	44	Informing farmers of possible changes in market needs
	29	Educating farmers about latest varieties
	43	Educating farmers about benefits of mechanization
	76	Farmers unity in decision making
	18	Encouraging new generation to take up scientific farming
	36	Participatory planning
	30	Educating farmers about agricultural grading
	64	Improving social commitment
Value addition and diversification	46	Training on latest processing technology
	81	Value addition of agricultural products
	34	Value addition of agricultural commodities
	50	Product diversification to maximise profit
	31	Value addition of by-products
	52	Diversification
	14	Value addition
Youth in farming	12	Encouraging young generation into farming
	69	Availability of skilled labourers
	70	Entry of educated youth as agricultural entrepreneurs
	79	Need based agricultural programme implementation

Cluster list of agricultural officers (contd)

Cluster name	Statement Number	Statement
Eco-friendly	5	Soil and water conservation
	6	Sustainable farming practices
	3	Organic farming
	35	Natural farming
	21	Practices that cause pollution to the least extend
	23	Organic management
	55	Eco-friendly management of crops
	24	Eco-friendly farming
	78	Restoring bio-diversity
	67	Conserving natural resources
	39	Conserving ecology
	61	Decrease ecological exploitation
Participatory planning	53	Watershed development
	71, 4	Watershed planning
	73	Increase per capita income
	42	Location specific cropping pattern
	7	Planning based on resource availability
Social concern	58	Thoughtful about posterity
	59	Women friendly technology
Need based technology transfer	40	Scientific planning
	54	Encouraging use of high yielding variety suitable for locality
	57	Assurance of food security
	63	User friendly machinery
Financial support	25	Ensuring fair support price
	48	Flexible agricultural loans
	11	Subsidised inputs
No middlemen	13	Mitigating unhealthy intervention of market middlemen
	68	Direct linkages of farmers with marketing outlets
	45	Better margin of profit
Storage and marketing	33	Encouraging scientific storage
	41,72,65,77,10	Chanelising marketing and marketing strategy
	2, 27,28	Direct access to market outlets
	47	Improve market for processed food products

Figure 4.5. Point map of agricultural officers

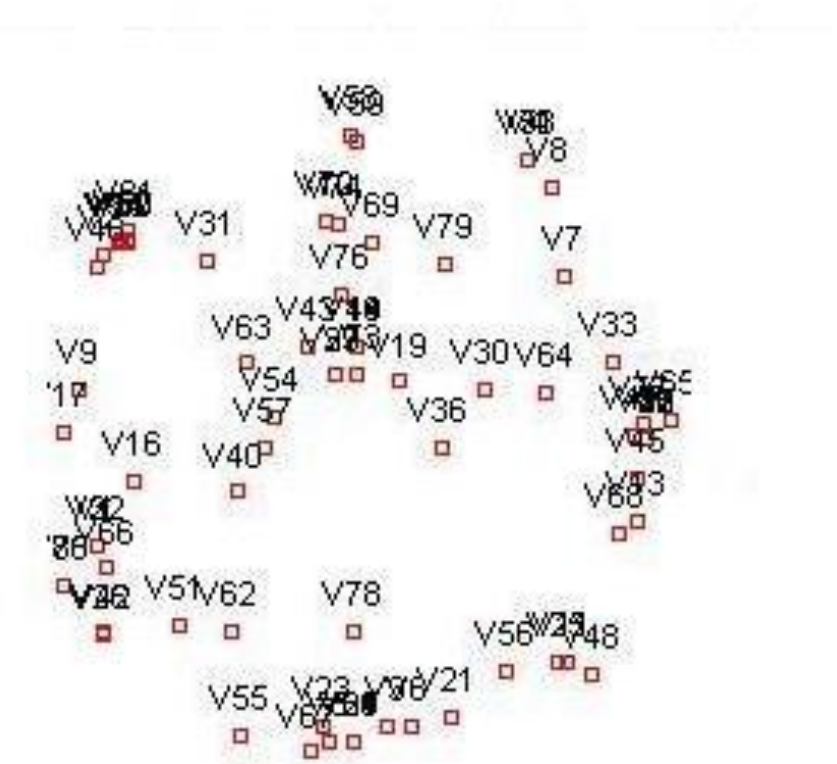
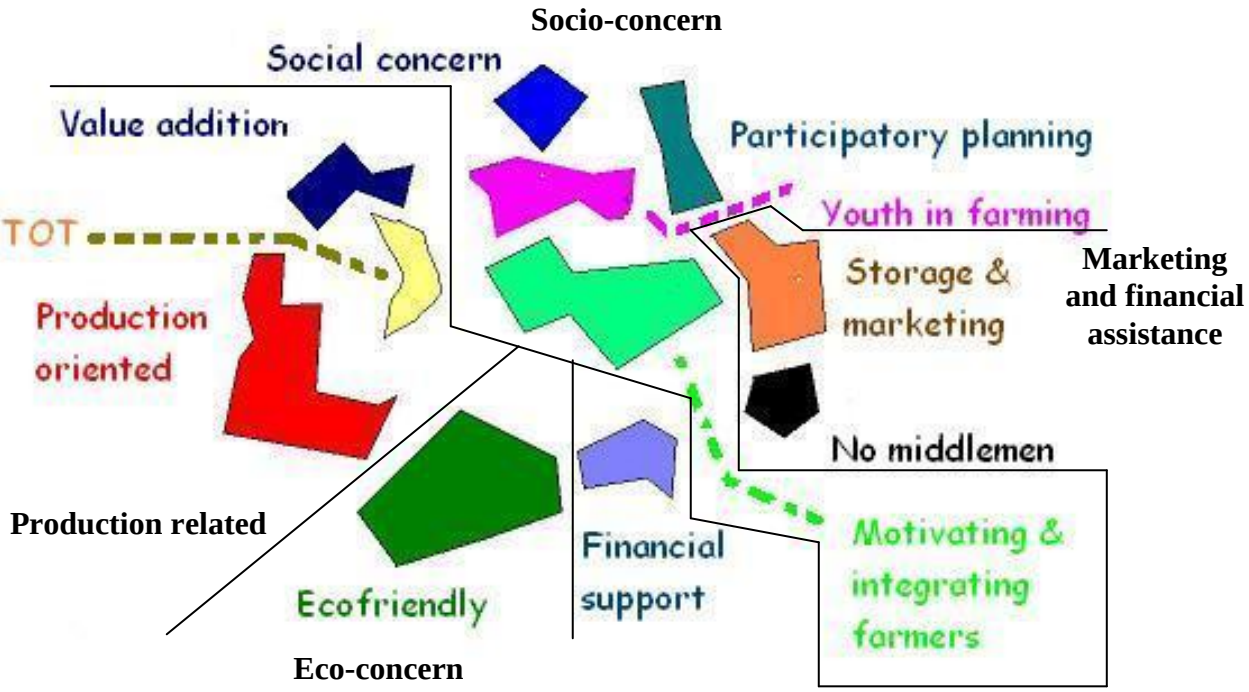
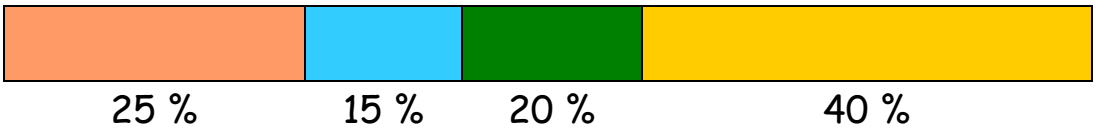


Figure 4.6 Concept map of agricultural officers



AGRICULTURAL OFFICER RESPONDENT GROUP



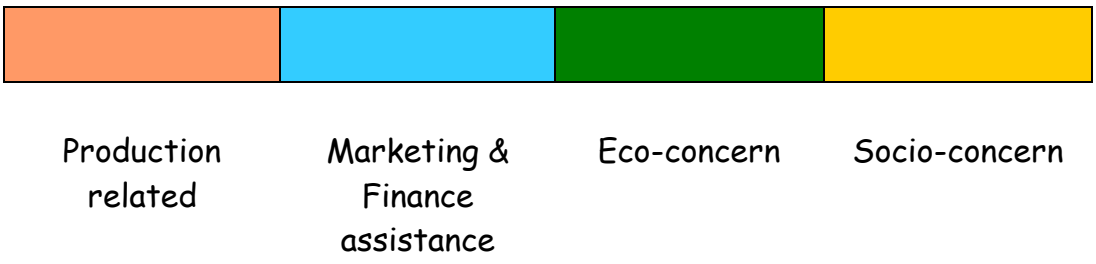


Table 4.5 Cluster list of statements of agricultural scientists

Cluster name	Statement Number	Statement
Organized marketing	45	Improve marketing
	10	Better marketing
	41	Branded produce
	44	Fair price for agricultural produce
	30	Channelising marketing
	31	Organised marketing linkages
	23	Reasonable price
	6	Scientific storage of produce
	21	Improve agricultural products
	18	Planned marketing linkages
	40	Storage structures
Scientific and sustainable farming	52	Diversified farming
	15	Accurate weather forecasting
	33	Advisory group
	2	Promoting scientific and sustainable farming
	43	Promoting natural farming
	14	Restoring eco-equilibrium
Product diversification	20	Diversification of products
	17	Enhance productivity via improved varieties
Extension services	46	Technical monitoring by experts
	38	Strengthening extension services
	58	Quality farm journals
Eco-friendly farming	1	Quality planting material
	49	Availability of good planting material
	9	Organic farming promotion
	22	Farming practices based on agro-ecological zones
	19	Eco-friendly practices
	5	Organic farming
	8	Group farming

Cluster list of statements of agricultural scientists (Contd)

Cluster name	Statement number	Statement
Mechanization	4	Improved farm machinery
	53	Localising mechanization
	12	Increased use of mechanization
Financial support	37	Facilitating rural finance
	26	Flexible loan procedures
	39	Crop insurance
	48	Production incentives
	29	Promotional schemes
Problem oriented research	16	Practice new technology
	24	Dissemination of new technology
	36	Prioritising implementing projects
	60	Problem oriented research
	11	Promoting latest scientific interventions
	56	Expert guiding
Participatory farming	28	Motivating poor farmers
	47	Area specific cropping strategy
	57	Micro and macro enterprises
	27	Social and economic upliftment of farming community
	13	Watershed plans

Figure 4.7. Point map of scientists

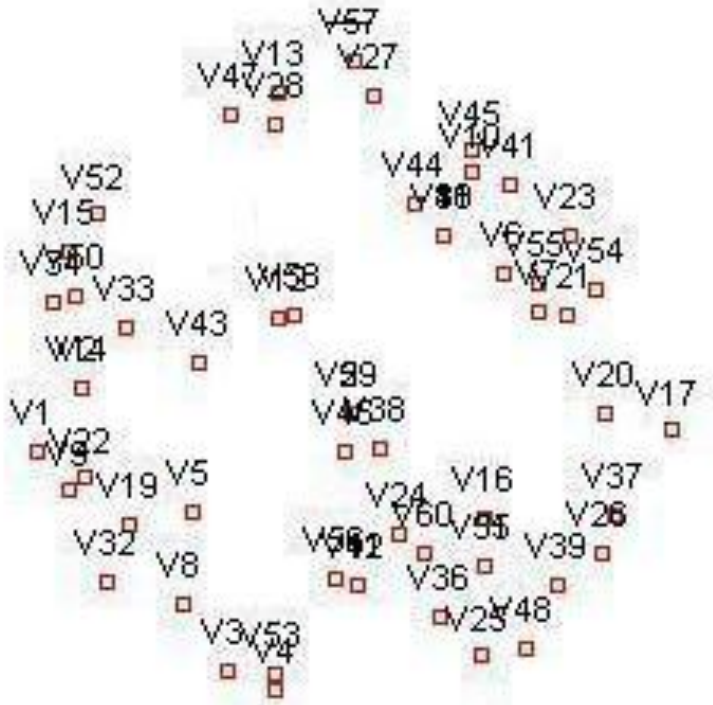
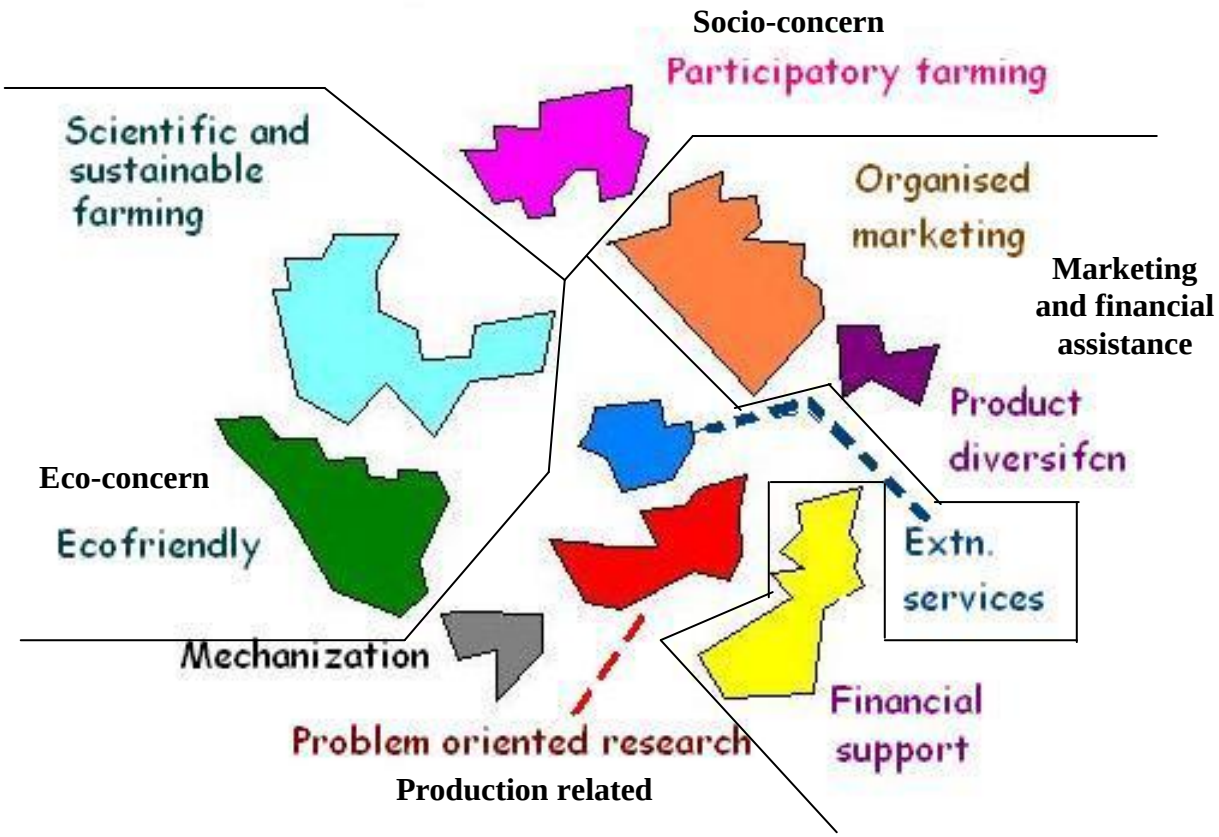
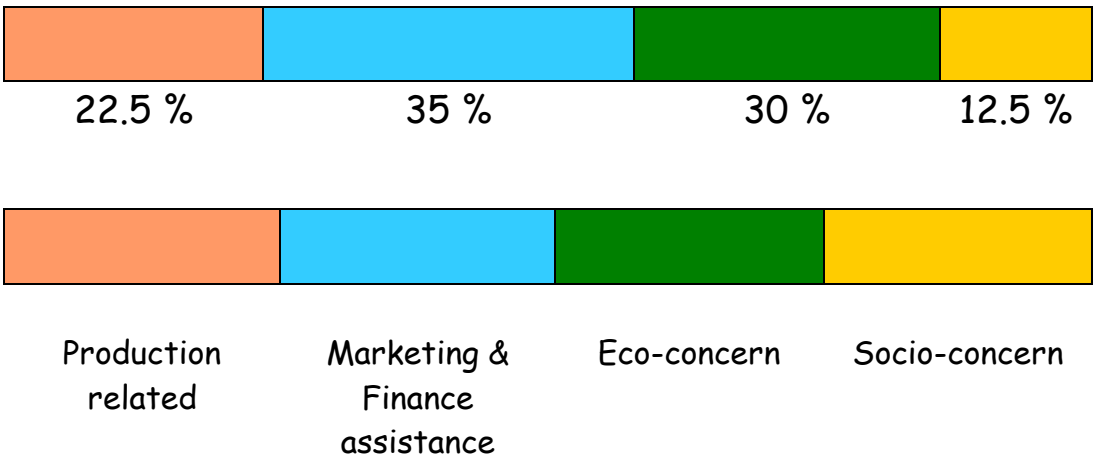


Figure 4.8 Concept map of scientists



AGRICULTURAL SCIENTIST RESPONDENT GROUP



Eco-concerning focal area contained two clusters namely, ‘eco-friendly’ and ‘sustainable farming’. The sole cluster in socio- concern was ‘participatory planning’. Production oriented focal area covered clusters ‘production oriented, ‘mechanization’ and ‘extension services’.

The cluster list (table 4.5) and point map (figure 4.7) assisted the interpretation of the concept map.

4.1.2.5. Comparative analysis of concept maps of respondent groups

The concept maps plotted by different respondent groups were analysed to understand how dissimilar one map was with other (figure 4.9). It was revealed from the study that the focal points of thinking among the four respondent groups vary considerably.

The concept map of progressive farmers displayed that major emphasis was on production related activities of agricultural development covering a cluster area of 45 % on the map. It revealed that the perception of farmers clustered along the production aspects alone with sufficient negligence towards other sub-concepts.

The extent of emphasis on production related activities of agricultural development was less in the map of panchayat presidents (40 %) when compared with progressive farmers and the prominence of social concern was noted. The socio-concerning cluster in the concept map occupied a cluster area of 30 %. The social commitment a panchayat president has as head of local administrative body is explicit from the cluster area of social concern. They have the pulse of the problems and prospects of the local farming community. Panchayat presidents were of the view that there should be strong government intervention in all the agricultural development activities and farmers should be motivated to take up the government prescribed programmes for the common good. They opined that the

Figure 4.9. Comparative analysis of conceptual focal areas under concept map of respondent groups

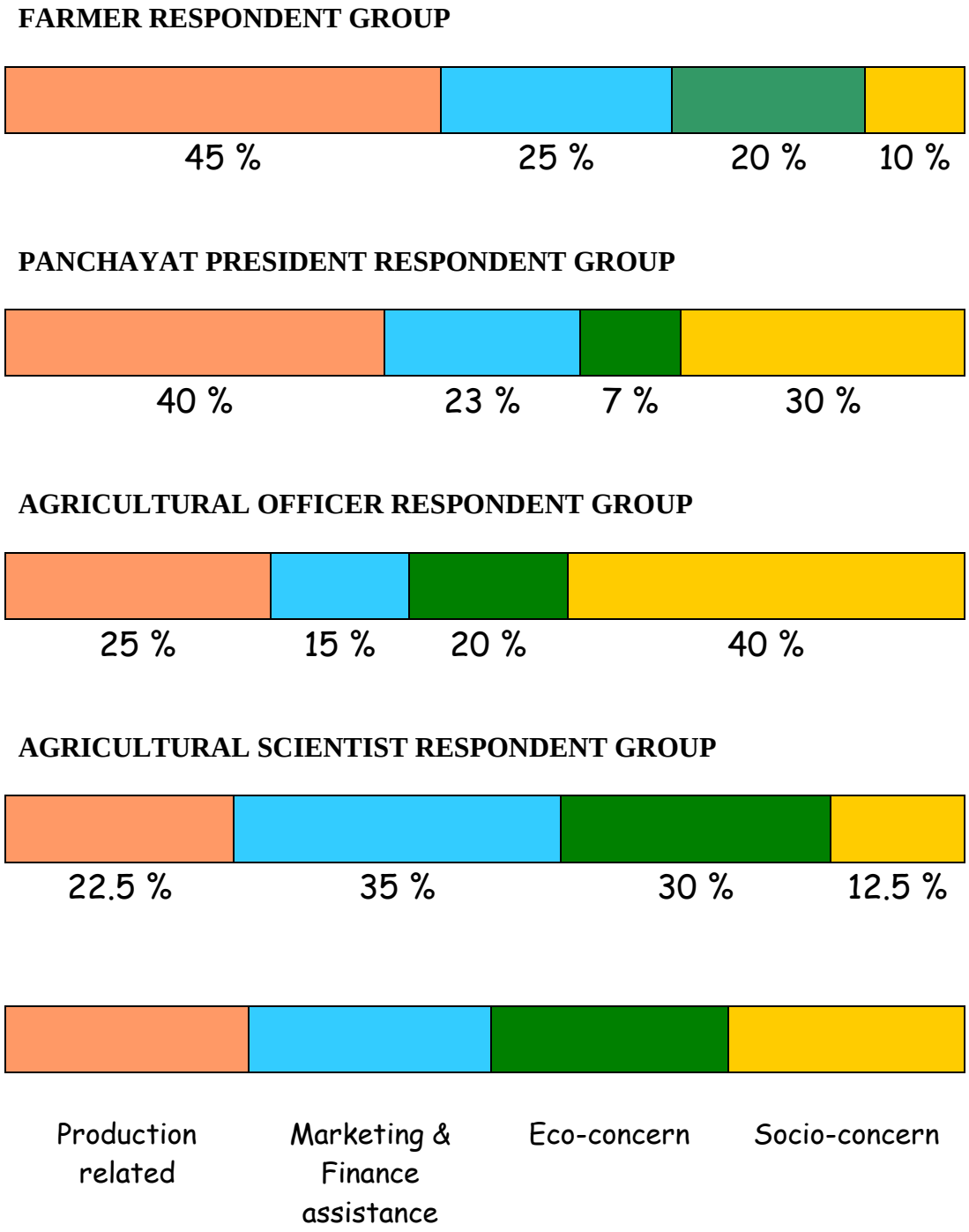


Figure 4.10. Comparison of production related concepts of respondents

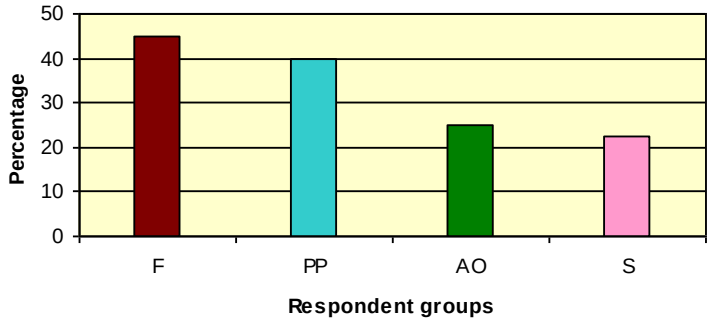


Figure 4.11. Comparison of marketing related concepts of respondents

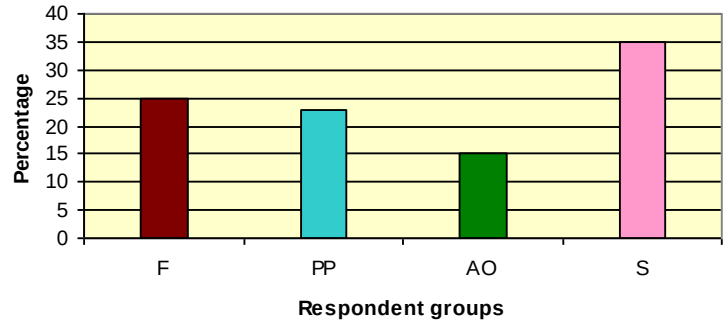


Figure 4.12. Comparison of eco-concerning concepts of respondents

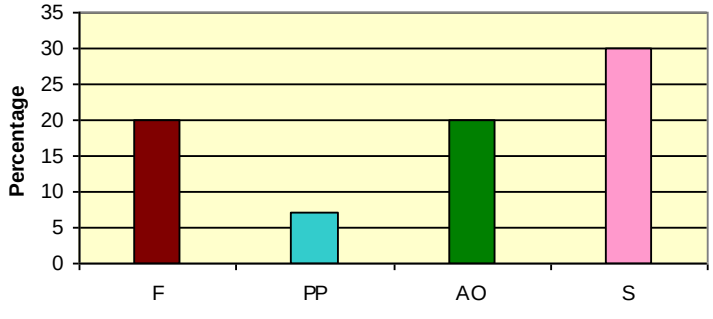
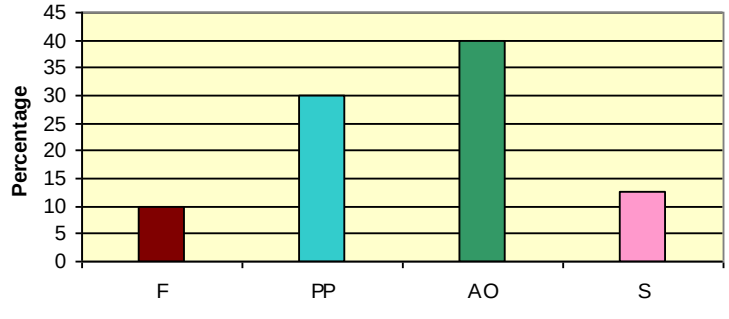


Figure 4.13. Comparison of socio-concerning concepts of respondents



government should identify what should be produced in an area and through which outlets the sale has to be made.

The focal point of concept map shifted from the above two groups of respondents when it was compared against concept map of agricultural officers. It was hinged on participatory approach and committed to the social well being. More significance was attributed to the social implications of agricultural development. Agricultural officers belong to that genre of extension personnel who feel the pulse of the common farmers. The extent of how any development activity under agriculture proliferates among the social strata of the society was of predominant importance to this respondent group and it was strongly indicated by the cluster area occupied in the map by socio-concerning concept.

Agricultural scientists are found to have a different pattern of conceptual alignment regarding agricultural development. The focus was deposited on the need of marketing and financial assistance (35 %) for the cause of agricultural development.

From figure 4.10, it was evident that it was the farmer respondent group followed by panchayat presidents that favoured production related activities of agricultural development. Least preference was attributed by scientists when compared with other respondent groups (22.5 %).

The bar graph (figure 4.11) indicated the paramount importance vested by scientists on the concept of marketing related activities. Agriculture officer respondent group was found to have least conceptual conformity (15 %) regarding marketing when compared with other respondent groups.

The agricultural scientists have sped far away from other respondents when compared to the concern they breed regarding ecological concept of agricultural development (figure 4.12). Panchayat presidents who are connected to

farming community through farmers of the locality was found to have least awareness (7 %) regarding ecological aspects of agricultural development.

The roles of agricultural officers as extension agents and panchayat presidents as development facilitators are strengthened by their conceptual clarity of social concern (figure 4.13).

4.2. LIST OF AGRICULTURAL ACTIVITIES STREAMLINED BY DIFFERENT RESPONDENT GROUPS

4.2.1. Analysis of activities streamlined by progressive farmers

The table 4.6 revealed that the total number of agricultural activities identified by the farmers respondent group was 40. They paid major attention to the activities that would directly influence the prices of produce. Their prime concern was on the farming practices and financial security against probable natural calamities and downswings in market prices of agricultural produce.

In a bird's eye view, it was understood that the major agricultural activities listed were focused around individual farmers' development on agriculture rather focusing on a bigger framework of agricultural development.

4.2.2. Analysis of agricultural activities streamlined by panchayat presidents

The different agricultural activities expressed by panchayat presidents under agricultural development were enlisted and the frequency of each in the list was calculated. For the ease in interpreting and comparing, it was converted into percentages (table 4.7).

The list provided the 'group think' of the respondent group and it revealed the shift in pattern of thinking from individual centred to group centred approach.

Table 4.6 Percentage of agricultural activities streamlined by progressive farmers

Sl No.	Activity under agricultural development	Percentage
1	Better insurance protection	6.27
2	Fair price for agricultural produce	5.92
3	Scientific agricultural practices	5.57
4	Export of agricultural products	4.87
5	Increasing per capita income	4.52
6	Economic and social empowerment of farmers	4.18
7	Implementing watershed plans	4.18
8	Employing traditional and scientific farming practices	3.50
9	Reduced labour charge	3.48
10	Adopting new varieties	3.13
11	Prevent excessive use of chemical fertilizers	3.13
12	Reducing cost of cultivation	3.13
13	Facilitating better irrigation	3.13
14	Emphasis on organic manure and organic fertilizers	2.78
15	Availability of quality planting material	2.78
16	Availability of subsidised seeds and fertilizers	2.43
17	Better social status for farmers	2.43
18	Improved production	2.43
19	Availability of agricultural labourers	2.43
20	Group farming	2.09
21	Conversion of barren land to arable land	2.09
22	Ensuring food security	2.09
23	Availability of tissue cultured plants	1.74
24	Availability of modern farm machinery	1.74
25	Policy changes promoting agriculture	1.74
26	Constructing check dams for irrigation	1.74
27	Preventing storage loss	1.39
28	Timely raising of crops	1.39
29	Organic farming	1.39
30	Procurement of cash crops and determining prices by government	1.39
31	Programmes for soil and water conservation	1.39
32	Empowering farming community to self sufficiency	1.39
33	Motivating younger generation into farming	1.39
34	Effecting marketing linkages	1.39
35	Soil testing	1.04
36	Conserving ecology	1.04
37	Better local storage facilities	1.04
38	Better marketing facilities	0.69
39	Conduct of agricultural seminars and classes to educate farmers	0.69
40	Educated farming youth	0.69

Table 4.7 Percentage of agricultural activities streamlined by panchayat presidents

Sl No.	Activity under agricultural development	Percentage
1	Social and economic welfare of farmers	5.55
2	Educating farmers of latest farming techniques	5.26
3	Fair price for agricultural products	5.26
4	Availability of agricultural loans without interest rate	4.97
5	Availability of quality seeds	4.67
6	Encouraging younger generation into farming	4.67
7	Increasing agricultural export	4.09
8	Increasing production of crops	4.09
9	Government mediated procurement of agricultural produce	3.50
10	Development based on watershed plans	3.50
11	Self sufficiency in food grains	3.50
12	Increasing per capita from farming	3.50
13	Protecting natural ecosystem	3.50
14	Integrating farmers for production, processing and marketing agricultural produce on group basis	3.21
15	Improving standard of living of farmers	3.21
16	Soil conservation	2.92
17	Self sufficiency in rice and vegetables production	2.92
18	Integrating traditional and scientific farming practices	2.63
19	Utilising barren and wasteland for agricultural needs	2.63
20	Irrigation	2.63
21	Group farming	2.34
22	Preventing conversion of paddy fields	2.34
23	Access to market	2.33
24	Coconut based development strategy	2.04
25	Conserving biodiversity	2.04
26	Preventing farmers' suicides	2.04
27	Window for expert advice	1.75
28	Timely transfer of technology to the farming community	1.46
29	Sustainable farming system	1.46
30	Food for every creature	1.17
31	Increasing value addition	1.16
32	Diversifying agricultural products	1.16
33	Encouraging small scale enterprises	0.87
34	Changing from food consumerism to food production	0.87
35	Monitoring of agricultural development schemes at Panchayat level	0.58

The outlook of panchayat presidents on agricultural development was broader than that of farmers. The need of social and economic welfare of the farming community equipping them with the suitable farming techniques and assurance of fair process for agricultural produce was counted most important by the respondent group.

4.2.3. Analysis of agricultural activities streamlined by agricultural officers

The list of agricultural activities arranged in decreasing order of percentages was furnished in table 4.8. The smaller list showed the comprehensiveness of perception of agricultural officers. The influence of various government mediated schemes, similar work culture, interaction with farmers of different categories and monthly review of progress of different schemes have got these officers similarly tuned in their perception. A perusal of the list revealed that the concepts of respondent groups were framed for the needs of local community mostly on a participatory approach.

4.2.4. Analysis of agricultural activities streamlined by agricultural scientists

The list of agricultural activities with their percentages was furnished in table 4.9. The diversified agricultural activities listed pointed out the wider perception of agricultural scientists.

Emphasis was laid on the marketing and economic aspects of agricultural development. They have identified all major agricultural activities that demanded scientific attention

Table 4.8 Percentage of agricultural activities streamlined by agricultural officers

Sl. No.	Activity under agricultural development	Percentage
1	Increasing crop production	8.62
2	Sustainable agricultural development	8.62
3	Providing need based scientific tips to farming community on a regular basis	6.89
4	Improving processing and marketing of agricultural produce	6.03
5	Reducing marketing middle men	5.17
6	Increasing crop subsidies	4.74
7	Fixing fair minimum prices for every agricultural produce	4.7
8	Undertaking projects based on watershed area	4.31
9	Product diversification	3.87
10	Participatory planning of agricultural projects	3.87
11	Minimising ecological exploitation	3.87
12	Changing attitude of people towards farming	3.45
13	Organic management of crops	3.45
14	Ensuring availability of agricultural labourers	3.45
15	Need based planning	3.01
16	Encouraging younger generation into scientific farming	3.01
17	Value addition of crops	3.01
18	Educating farmers on agricultural grading	3.01
19	Better marketing strategy	2.58
20	Conversion from traditional farming to hi-tech farming	2.58
21	Resource based planning	2.15
22	Formulating laws to protect ecology against pollution	1.72
23	Educating farmers about mechanization	1.72
24	Encouraging self sustainability in vegetable production	1.72
25	Women friendly agricultural development strategies	1.29
26	Conserving soil, water and plant population	0.86
27	More stress on eco- friendly agricultural practices	0.86
28	Introducing agroclimate based monocropping	0.86
29	Changing from adaptation trials to invention trials	0.43

Table 4.9 Percentage of agricultural activities streamlined by agricultural scientists

Sl No.	Activity under agricultural development	Percentage
1	Timely processing of agricultural products	8.92
2	Facilitating flexible agricultural loans	6.89
3	Use of scientific and sustainable farming practices	5.58
4	Facility for scientific weather forecasting	5.58
5	Selecting ecofriendly agricultural practices	4.68
6	Practice of advanced scientific technologies	4.24
7	Planned and organised marketing	4.24
8	Prioritisation of implementing projects	4.24
9	Restoring organic richness of soil	4.01
10	Marketing facilities	3.79
11	Conducting problem oriented research	3.79
12	Providing storage structures like cold storages at common marketing places	3.57
13	Need based and timely transfer of technology	3.57
14	Restoring ecological balance	3.12
15	Diversification of agricultural produce	3.12
16	Planning on the basis of watersheds	2.90
17	Ensuring reasonable prices for agricultural products	2.90
18	Efficient extension windows for information, consultation and guidance	2.90
19	Farmer participatory planning	2.68
20	Production and distribution of quality planting material	2.67
21	Encouraging group farming	2.67
22	Dissemination of latest and area specific technologies	2.67
23	Better use of farm machinery	2.45
24	Enhancing agricultural productivity by improved varieties	2.45
25	Promotion of practical scientific methods	2.23
26	Channelising marketing system	2.23

27	Access to national and international markets	2.23
28	Formation of expert advisory group for specific crops	2.01
29	Promoting organic farming	2.00
30	Ensuring better crop insurances against unexpected natural disasters	2.00
31	Setting agricultural policies	2.00
32	Promoting macro and micro agricultural enterprises	1.78
33	Production incentives for crops with high cultivation cost like rice	1.56
34	Diversification of farming	1.34
35	Storage facility of agricultural produce	1.33
36	Improving quality of agricultural products	1.33
37	Social and economic development of farming community	1.33
38	Need based adaptation of farm machinery	1.12
39	Facilitating rural finance	0.89
40	Strengthening extension services	0.89
41	Promoting branding of agricultural products	0.89
42	Area specific cropping strategy	0.89
43	Implementing farmer benefitting schemes	0.67
44	Quality control agricultural inputs	0.45
45	Construction and protection of irrigation structures	0.44
46	Encouraging farmers through promotional schemes	0.44
47	Recognizing progressive farmers and motivating poor farmers	0.22
48	Functional agroclinics	0.22
49	Access to quality farm journals	0.22

4.3. ACTIVITY RANKING UNDER VARIOUS DIMENSIONS

4.3.1.`Activity ranking under physical dimension of agricultural development

Table 4.10 Ranking of agricultural activities under physical dimension by respondent groups

Sl. No.	Activity under physical dimension	Kruskal Ranks			
		Farmers	Panchayat presidents	AO	Scientists
1	Construction of irrigation facility	1	2	4	3
2	Conservation and promotion of water harvesting structures at local level	2	1	3	4
3	Conservation of top soil	2	1	3	4
4	Construction of plant care structures like green house, shade house etc	1	2	3	4
5	Construction of scientific and well planned markets	3	4	2	1
6	Encouraging sustainable and scientific farming practices	3	4	1	2
7	Promoting Agmark certification	3	4	2	1
8	Access to local library with ample farm magazines, farm reports and TV programmes	3	2	4	1
9	Precise and effective soil testing	2	1	3	4
10	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level	2	1	3	4
11	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables	3	4	1	2
12	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss	3	4	2	1
13	Utilization of barren land	4	3	2	1
14	To improve soil structure by increasing soil organic content and population of beneficial soil microbes	3	4	1	2

The activities under physical dimension were classified into infrastructural facilities and structured activities for the ease of interpreting. From the ranks allotted by farmers under this dimension, it was understood that this respondent group had favoured the construction of infrastructural facilities and plant care structures. According to farmers, structures facilitating irrigation and plant care were of paramount importance as they related these structures directly to increase in production (Table 4.11).

There was notable difference from how panchayat presidents perceived the relevance of different activities under physical dimension when compared to farmer respondent group. Panchayat presidents ranked the structured activities like conservation and promotion of water harvesting structures, conservation of top soil, precise and effective soil testing and self sufficiency in agricultural inputs at local level as important ones. The call for conserving rain water using different water harvesting structures had permeated enough through mass media into the mind set of people. Panchayat presidents being the heads of local administrative bodies hence understood the relevance in promoting water harvesting in their areas of jurisdiction(Table 4.12).

Farmers ranked some of the infrastructural facilities and panchayat presidents have ranked some of the structured activities as relevant ones. This diversion in preference can be attributed to thinking of panchayat presidents on behalf of a community as against individual purview of a farmer.

It was evident from the ranks allotted by agricultural officers that importance has been apportioned to activities belonging to infrastructural facilities and structured activities. It was interesting to note that agricultural officers have ranked the activities under this dimension in a distributive manner and not concentrating on any focal activities. They have ranked sustainable and scientific farming, infrastructural and technical facilities to ensure timely processing of perishable commodities and improving soil structure by increasing soil organic

Table 4.11 Activity ranking by progressive farmers under physical dimension

Rank	Activity
1	Conservation of top soil
2	Construction of irrigation facility
3	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level
4	Encouraging sustainable and scientific farming practices
5	Conservation and promotion of water harvesting structures at local level
6	Precise and effective soil testing
7	Construction of scientific and well planned markets
8	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables
9	To improve soil structure by increasing soil organic content and population of beneficial soil microbes
10	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss
11	Utilization of barren land
12	Construction of plant care structures like green house, shade house etc
13	Access to local library with ample farm magazines, farm reports and TV programmes
14	Promoting Agmark certification

Table 4.12 Activity ranking by panchayat presidents under physical dimension

Rank	Activity
1	Conservation of top soil
2	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level
3	Construction of irrigation facility
4	Precise and effective soil testing
5	Conservation and promotion of water harvesting structures at local level
6	Encouraging sustainable and scientific farming practices
7	Construction of scientific and well planned markets
8	Utilization of barren land
9	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss
10	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables
11	Utilization of barren land
12	Construction of plant care structures like green house, shade house etc
13	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables
14	Access to local library with ample farm magazines, farm reports and TV programmes

Table 4.13 Activity ranking by agricultural officers under physical dimension

Rank	Activity
1	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level
2	Conservation of top soil
3	Encouraging sustainable and scientific farming practices
4	To improve soil structure by increasing soil organic content and population of beneficial soil microbes
5	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables
6	Conservation and promotion of water harvesting structures at local level
7	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss
8	Construction of scientific and well planned markets
9	Utilization of barren land
10	Construction of irrigation facility
11	Precise and effective soil testing
12	Access to local library with ample farm magazines, farm reports and TV programmes
13	Construction of plant care structures like green house, shade house etc
14	Promoting Agmark certification

Table 4.14 Activity ranking by agricultural scientists under physical dimension

Rank	Activity
1	Construction of scientific and well planned markets
2	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level
3	Encouraging sustainable and scientific farming practices
4	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss
5	Conservation of top soil
6	To improve soil structure by increasing soil organic content and population of beneficial soil microbes
7	Conservation and promotion of water harvesting structures at local level
8	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables
9	Utilization of barren land
10	Construction of irrigation facility
11	Access to local library with ample farm magazines, farm reports and TV programmes
12	Precise and effective soil testing
13	Construction of plant care structures like green house, shade house etc
14	Promoting Agmark certification

content and beneficial soil microbes as most relevant ones when compared to other respondent groups(Table 4.13).

Scientist have focused on market infrastructural facilities and utilizing available information resources for the sake of improving marketing strategies. They have underlined the need of having well branded Agmark certified products in market to have an upper hand in quality produce. Barren lands unfit for cultivation can be reclaimed to construct state-of- the- art storage structures (Table 4.14).

4.3.2. Activity ranking under economic dimension of agricultural development

Table 4.15 Comparison of ranking of activities under economic dimension by respondent groups

Sl No.	Activity under economic dimension	Kruskal Ranks			
		Farmers	PP	AO	Scientists
1	Supply of agricultural labourers as per farming requirement	2	1	4	3
2	Insurance for agricultural crops on simpler terms	1	2	4	3
3	Improved value addition of agricultural products	3	1	2	4
4	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products	4	3	2	1
5	Facilitity to forecast prices of agricultural products	2	1	3	4
6	Formulation of marketing policies to ensure fair price for agricultural products	4	3	1	2
7	Government intervention to control unexpected increase in prices of various agricultural inputs	4	3	2	1
8	Devising policies facilitating effective storage and distribution of agricultural produce	3	4	2	1
9	Market based integration of agricultural activities from seeding to harvesting the produce	3	4	2	1

There were nine activity statements under this dimension of agricultural development. It can be understood from the above table how each respondent group considered different activities under this dimension. There was notable closeness among farmers and panchayat presidents ranking and ranking carried out by agricultural officers and scientists.

The strongest inclination of farmers towards having effective crop insurance plans revealed the personal fear of financial insecurity when the crop fails to remunerate. Farmers suicides can be an extended version of this financial insecurity. The farmer respondent group was also more concerned about the unavailability of skilled agricultural labourers and the increasing labour charges that decrease the margin of profit considerably. Farmers prefered to be informed of possible hikes in agricultural process for different crop produces so that a crop plan can be drawn well in advance(Table 4.16).

Panchayat president respondent group ranked the availability of skilled agricultural labourers, facility to forecast agricultural process and increased value addition of agricultural products as the most important ones when compared with respondent groups. The crop insurance schemes which were given predominant importance by farmers when compared with others was ranked second by panchayat presidents(Table 4.17).

The philosophical underpinning of ranking the activity statements under economic dimension of agriculture by the agriculture officers was based on the formation of marketing policies to ensure fair price for every crop. Hence the priority of ranking activities of increased value addition facilities for agricultural products, formation of marketing linkages on district- state basis ensuring fair price for agricultural products, facilitating effective storage and distribution of products, government intervention to control prices of agricultural inputs and integrating agricultural activities from seeding to harvesting based on market gained importance(Table 4.18).

Table 4.16 Activity ranking by progressive farmers under economic dimension

Rank	Activity under economic dimension
1	Insurance for agricultural crops on simpler terms
2	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products
3	Facilitity to forecast prices of agricultural products
4	Supply of agricultural labourers as per farming requirement
5	Devising policies facilitating effective storage and distribution of agricultural produce
6	Improved value addition of agricultural products
7	Market based integration of agricultural activities from seeding to harvesting the produce
8	Formulation of marketing policies to ensure fair price for agricultural products
9	Government intervention to control unexpected increase in prices of various agricultural inputs

Table 4.17 Activity ranking by panchayat presidents under economic dimension

Rank	Activity under economic dimension
1	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products
2	Improved value addition of agricultural products
3	Supply of agricultural labourers as per farming requirement
4	Facilitity to forecast prices of agricultural products
5	Insurance for agricultural crops on simpler terms
6	Formulation of marketing policies to ensure fair price for agricultural products
7	Market based integration of agricultural activities from seeding to harvesting the produce
8	Devising policies facilitating effective storage and distribution of agricultural produce
9	Government intervention to control unexpected increase in prices of various agricultural inputs

Table 4.18 Activity ranking by agricultural officers under economic dimension

Rank	Activity under economic dimension
1	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products
2	Formulation of marketing policies to ensure fair price for agricultural products
3	Market based integration of agricultural activities from seeding to harvesting the produce
4	Improved value addition of agricultural products
5	Devising policies facilitating effective storage and distribution of agricultural produce
6	Facilitity to forecast prices of agricultural products
7	Government intervention to control unexpected increase in prices of various agricultural inputs
8	Supply of agricultural labourers as per farming requirement
9	Insurance for agricultural crops on simpler terms

Table 4.19 Activity ranking by agricultural scientists under economic dimension

Rank	Activity under economic dimension
1	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products
2	Market based integration of agricultural activities from seeding to harvesting the produce
3	Formulation of marketing policies to ensure fair price for agricultural products
4	Devising policies facilitating effective storage and distribution of agricultural produce
5	Government intervention to control unexpected increase in prices of various agricultural inputs
6	Facilitity to forecast prices of agricultural products
7	Improved value addition of agricultural products
8	Supply of agricultural labourers as per farming requirement
9	Insurance for agricultural crops on simpler terms

Scientists seem to have maximum concern about activities under economic dimension. They have given prime importance to state wide marketing linkages, policy formulation and government intervention for effective storage and distribution of products so that fair prices can be assured(Table 4.19).

From the ranks of different respondent groups, it was figured out that farmers and panchayat presidents had almost conjoint concepts regarding activities under this dimension and there was remarkable closeness in judging the activities among agricultural officers and scientists. Agricultural officers being the major extension agents seem to have influenced the thought process of farmers to some extent. Closeness in ranking some of the agricultural activities ascertain this.

4.3.3. Activity ranking under socio-psychological dimension of agricultural development

Table 4.20 Comparison of ranking of activities under socio-psychological dimension by respondent groups

Sl. No.	Activity under socio-psychological dimension	Kruskal Ranks			
		Farmers	Panchayat Presidents	AO	Scientists
1	To improve the attitude of educated youth towards farming	3	1	4	2
2	To encourage 'Sunday farming' among non- farmers	2	3	1	4
3	To encourage group farming	2	3	1	4
4	To rehabilitate and train displaced agricultural labourers	2	3	1	4
5	To assure deserving social status and respect to farmers	3	4	2	1
6	To facilitate better linkages between producers and enterpreneurs	3	4	2	1

Table 4.21 Activity ranking by progressive farmers under socio-psychological dimension

Rank	Activity
1	To encourage group farming
2	To assure deserving social status and respect to farmers
3	To facilitate better linkages between producers and enterpreneurs
4	To improve the attitude of educated youth towards farming
5	To rehabilitate and train displaced agricultural labourers
6	To encourage ‘Sunday farming’ among non- farmers

Table 4.22 Activity ranking by panchayat presidents under socio-psychological dimension

Rank	Activity
1	To encourage group farming
2	To assure deserving social status and respect to farmers
3	To improve the attitude of educated youth towards farming
4	To facilitate better linkages between producers and enterpreneurs
5	To encourage ‘Sunday farming’ among non- farmers
6	To rehabilitate and train displaced agricultural labourers

Table 4.23 Activity ranking by agricultural officers under socio-psychological dimension

Rank	Activity
1	To encourage group farming
2	To assure deserving social status and respect to farmers
3	To facilitate better linkages between producers and enterpreneurs
4	To rehabilitate and train displaced agricultural labourers
5	To improve the attitude of educated youth towards farming
6	To encourage ‘Sunday farming’ among non- farmers

Table 4.24 Activity ranking by agricultural scientists under socio-psychological dimension

Rank	Activity
1	To assure deserving social status and respect to farmers
2	To facilitate better linkages between producers and enterpreneurs
3	To encourage group farming
4	To rehabilitate and train displaced agricultural labourers
5	To assure deserving social status and respect to farmers
6	To encourage ‘Sunday farming’ among non- farmers

It was clear from the ranks given by farmers that they lack a distinct consensus in ranking activity statements under this dimension. They have given relative importance to group farming and rehabilitation of displaced agricultural labourers (Table 4.21).

Panchayat presidents were mostly concerned in bringing forth educated youth in farming (Table 4.22). Agricultural officers were interested in bringing more and more people under farming which is indicative of their ranking to encourage group farming, Sunday farming among non-farmers and to rehabilitate displaced labourers (Table 4.23).

Agricultural scientists were more concerned about attributing better social status and facilitating linkages between producers and entrepreneurs in agribusiness (Table 4.24) In a nutshell, it can be understood that panchayat presidents were interested in mobilising younger generation into farming whereas agricultural officers gave thrust on encouraging group farming among farmers to stand united. Scientists viewed socio-psychological dimension with more preference on favourable marketing linkages among different stakeholders in agribusiness.

4.3.4. Activity ranking under ecological dimension of agricultural development

Table 4.25 Comparison of ranking of activities under ecological dimension by respondent groups

Sl. No.	Activity under ecologic dimension	Kruskal Ranks			
		Farmers	Panchayat Presidents	AO	Scientists
1	Awareness against excessive use of agro-chemicals in farming	4	3	2	1
2	Practice sustainable and eco-friendly farming practices	3	1	2	4
3	Integrated use of organic methods in farming	1	2	4	3
4	Conserving local natural biodiversity	3	1	4	2
5	Utilizing barren lands for enriching conservation of local biodiversity	3	4	1	2

Table 4.26 Activity ranking by progressive farmers under ecological dimension

Rank	Activity
1	Integrated use of organic methods in farming
2	Practice sustainable and eco-friendly farming practices
3	Awareness against excessive use of agro-chemicals in farming
4	Utilizing barren lands for enriching conservation of local biodiversity
5	Conserving local natural biodiversity

Table 4.27 Activity ranking by panchayat presidents under ecological dimension

Rank	Activity
1	Practice sustainable and eco-friendly farming practices
2	Awareness against excessive use of agro-chemicals in farming
3	Integrated use of organic methods in farming
4	Conserving local natural biodiversity
5	Utilizing barren lands for enriching conservation of local biodiversity

Table 4.28 Activity ranking by agricultural officers under ecological dimension

Rank	Activity
1	Awareness against excessive use of agro-chemicals in farming
2	Utilizing barren lands for enriching conservation of local biodiversity
3	Integrated use of organic methods in farming
4	Practice sustainable and eco-friendly farming practices
5	Conserving local natural biodiversity

Table 4.29 Activity ranking by agricultural scientists under ecological dimension

Rank	Activity
1	Awareness against excessive use of agro-chemicals in farming
2	Practice sustainable and eco-friendly farming practices
3	Integrated use of organic methods in farming
4	Utilizing barren lands for enriching conservation of local biodiversity
5	Conserving local natural biodiversity

As far as farmers were concerned, there was a heavier inclination in adopting organic farming practices as the price tags attached to such marketed products are tantalizing (Table 4.26).

But the ranking done by presidents made it clear that their concern about ecological dimension of agriculture was based on the increased awareness created by different campaigns about the effects of adopting sustainable and eco-friendly farming practices and conserving local biodiversity. Preferences made by presidents were reflective of thinking for a community as a whole (Table 4.27).

The utilization of barren land was considered most importantly by agricultural officers for enriching local biodiversity (Table 4.28). Scientists who are well informed about the ill effects of excessive use of agro chemicals, found it perilous if the condition continues any further. This reason can be attributed for ranking awareness against excessive use of chemicals as the most preferred one (Table 4.29).

4.4. COMPARISON OF RANK VALUES BETWEEN RESPONDENT GROUPS UNDER VARIOUS DIMENSIONS

Table 4.30 Rank values of respondent groups under various dimensions

Dimension	Kruskal Rank values			
	Progressive farmers	Panchayat presidents	Agricultural officers	Agricultural scientists
Physical	35	37	34	34
Economic	26	22	22	20
Socio-psychological	15	18	11	16
Ecological	14	11	13	12
Total rank values	90	88	80	82
Ranks	**4**	**3**	**1**	**2**

Ranks were attributed in such a manner that respondent group having least total rank value was given highest rank as per Kruskal Wallis ranking. It was agricultural officer respondent group that backed first rank which indicated that they had more conceptual clarity regarding agricultural development under various dimensions. Agricultural officers have a scientific backing to support their thinking and are in a constant phase of interaction with local farming community to understand their prospects and problems. Hence it is explicit from the ranking about the importance these extension personnels have in agricultural development.

Agricultural scientists stood just behind agricultural officers. It was their lack of clarity regarding socio-psychological concept of agricultural development that made this respondent group to stand second to agricultural officers. Scientists were mostly concerned about economic dimension and it was indicated from the ranking. Officers and scientists had almost same concern in most of the focal areas located under their respective concept maps.

Panchayat presidents were ranked third and farmers were ranked fourth. There was not much difference in their perception regarding agricultural development. Panchayat president groups of respondents were more concerned about ecological and socio-psychological dimensions when compared with farmers.

4.5 MODEL FOR AGRICULTURAL DEVELOPMENT

The activity statements ranked under each dimension by four respondent groups were analyzed. Out of the 34 activity statements in the ranking schedule, ten activity statements which were preferred best by respondent groups were

distilled out to construct a cumulative model for agricultural development (table 4.3) .

Table 4.31 Model for agricultural development

Sl No.	Activity statement
1	Construction of scientific and well planned markets
2	Self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers etc. at local level
3	Conservation of top soil
4	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products
5	Insurance for agricultural crops on simpler terms
6	To assure deserving social status and respect to farmers
7	To encourage group farming
8	Awareness against excessive use of agro-chemicals in farming
9	Practice sustainable and eco-friendly farming practices
10	Integrated use of organic methods in farming

Under physical dimension, respondents selected three activity statements as major ones. Those statements are listed below:

1.
2. Construction of scientific and well planned markets
3. Self sufficiency in agricultural inputs
4. Top soil conservation

Activity statements preferred among the respondent groups under economic dimension of agricultural development were integrated network of markets and crop insurance. Social status and respect to farmers, and group farming were the chosen activity statements under socio-psychological dimension.

The three activity statements chosen by respondent groups under ecological dimension were the following:

1. Awareness against excess use of agro-chemicals
2. Sustainable and eco-friendly farming practices
3. Integrated use of organic methods

It was understood that not a single activity statement was ranked unanimously by all the four respondent groups. This indicated the divergence of thinking in the conceptual domain under each dimension identified under agricultural development.

Thus, a model for agricultural development which contained ten activity statements were distilled from the cumulative concepts of progressive farmers, panchayat presidents, agricultural officers and agricultural scientists.

4.5.1 Venn diagram of agricultural development model

The model for agricultural development was depicted as a venn diagram (figure 4.14) to give a pictorial representation of the unanimity of ranking done by different respondent groups. The different activity statements falling under same

dimension were indicated in same pattern. The closeness in the placement of activity statement with regard to the central concept of agricultural development indicated the unanimity in choosing those activities by respondent groups as most relevant ones. The distant ones indicated those activity statements that were ranked by any single respondent group as the most relevant one.

Figure 4.14. Venn diagram of agricultural development model

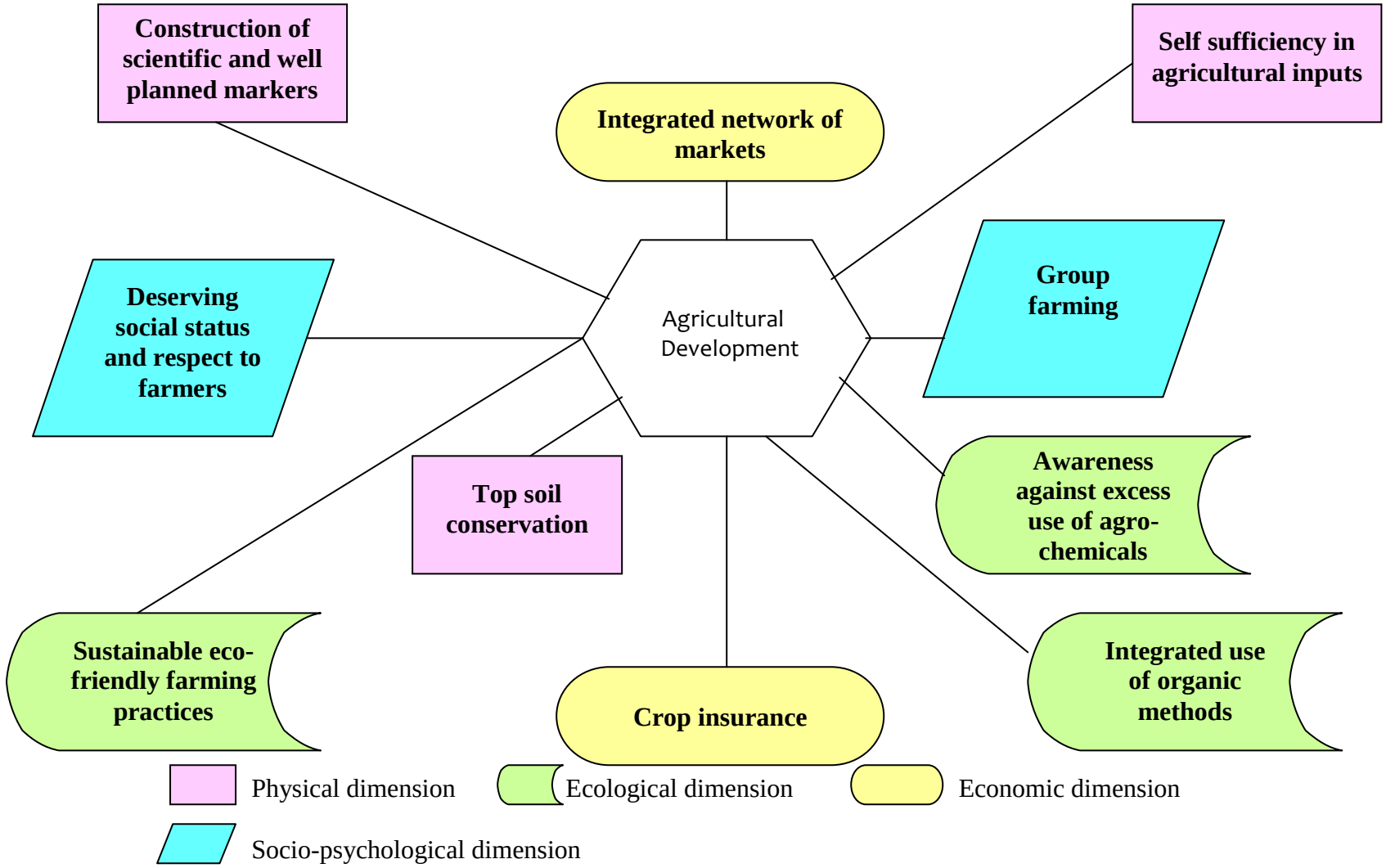
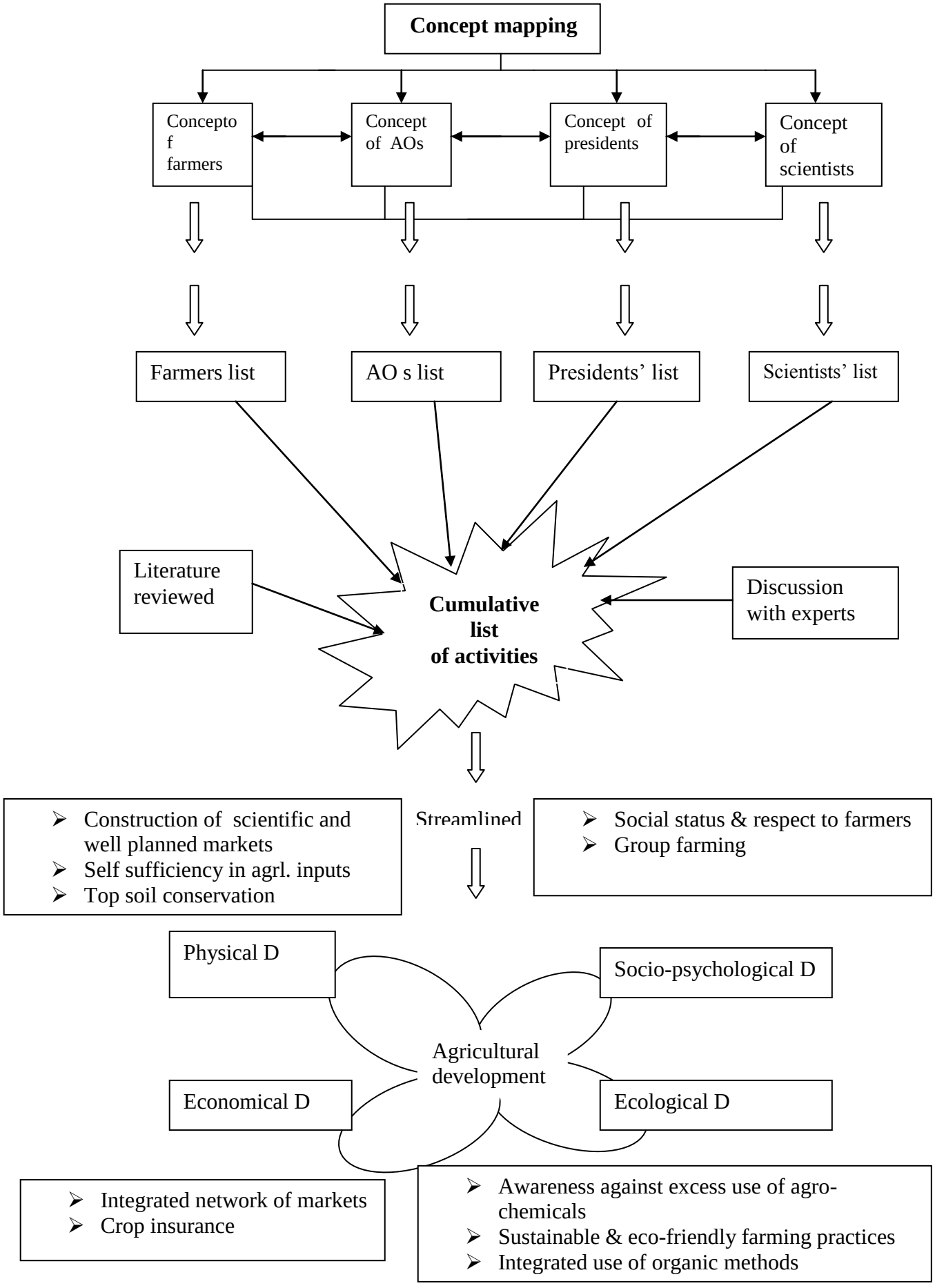


Figure 4.15 **Empirical framework**



SUMMARY

5. SUMMARY

India's agrarian culture and economy is undergoing drastic changes. In this progressive path of agricultural resurrection, a comprehensive multidimensional understanding of agricultural development is of great importance. In the present context of Kerala, where the local administrative bodies are vested with more powers to plan and execute need based agricultural development activities, a clear understanding of the concept of agricultural development among the major stakeholders shall serve as a firm base for development.

The main objectives of the study were as follows:

e) To study the existing concept of agricultural development in Kerala as perceived by farmers, elected members of local administrative bodies, agricultural officers and agricultural scientists
f) To systematically analyze the lacks and lapses in the existing concept
g) To identify and streamline the missing components for a more holistic model
h) To propose a reoriented multidimensional model for agricultural development in the context of Kerala

The present study was carried out in five blocks of Thrissur district, namely, Mullassery, Vadakkanchery, Chavakkad, Chowannur and Ollukkara. Progressive farmers, panchayat presidents, agricultural officers and agricultural scientists were the four groups of respondents selected for the study.

An open ended question was formulated to explore, explain and clarify the perceptions of these respondent groups on the concept of agricultural development. The focal question structured for this purpose was as follows:
'Based on your knowledge and experience over the years and as a stakeholder in the process of development, how would you define agricultural development?'

The responses collected from the four respondent groups which were reflective of their perceptions were assigned scores on the basis of a previously identified definition of agricultural development. The mean score of the four groups were compared to reveal the perception differences.

The perception differences among the respondent groups were visually depicted by using the tool of concept mapping. It is a multi-step hybrid method that uses original respondent statements as units of analysis, aggregate qualitatively across individual conceptual schemes and enables the data to emerge through the use of multidimensional scaling and cluster analysis of the aggregated individual coding data. Concept mapping process involved six steps:

7) Preparation (including selection of participants and development of focus for the conceptualization)
8) Generation of statements
9) Structuring of statements
10) Representation of Statements in the form of a concept map (using multidimensional scaling and cluster analysis)
11) Interpretation of maps
6) Utilization of Maps

Ranking schedule with four sub-sections namely, physical dimension, economic dimension, ecological dimension and socio-psychological dimension was prepared after discussing with agricultural experts and incorporating productive suggestions from the different respondent groups.

The major findings of the present study are as follows:

- Comparison of percentage mean scores between various respondent groups conducted after the analysis of the responses of open ended

questions revealed that agricultural scientists scored the most (75 %) and farmers scored the least (36.3). The scores of agricultural officers and panchayat presidents were respectively 50 % and 41 %. The extent of perception differences among the four respondent groups regarding the concept of agricultural development was significant when it was compared with a standard definition chosen for the purpose of the present study.

- The concept map of progressive farmers displayed that major emphasis was on production related activities of agricultural development covering cluster area of 45 % on the map. Map area covered by 'marketing and finance assistance' was 25 % in the farmers concept map and 20 % under eco-concern and 10 % under socio-concern.

- The extent of emphasis on production related activities of agricultural development was less in the concept map of panchayat presidents (40 %). It was revealed that 30 % of cluster area was covered by socio-concern, 23 % under marketing and finance assistance and the remaining 7 % under eco-concern.

- From the concept map of agricultural officers, it was understood that major emphasis was laid on socio-concern (40 %), followed by production related conceptual focal area (25 %).

- The concept map of agricultural officers was hinged on participatory approach and committed to social well-being of the society. About 40 % of total cluster area occupied fell under socio-concern. Area under production related conceptual focal area was 25 % of total area. It was followed by eco-concern (20 %) and marketing and finance assistance (15 %).

- The concept map of agricultural scientists stood out distinctly from the rest of the concept maps. The major emphasis was on marketing and finance

assistance covering an area of 35 %. The second most concern was on the conceptual focal area of eco-concern (30 %) followed by production related activities (22.5 %).

- Progressive farmers and panchayat presidents concentrated more on production related activities on agricultural development. The divergence in the pattern emerged due to the increased concern of panchayat presidents on socio-concern when compared with that of progressive farmers.

- The salient feature that differentiated the concept of agricultural officers from panchayat presidents was the increased emphasis of socio-concern by agricultural officers. It was examined to be 10 % greater than that of panchayat presidents. Panchayat presidents found it more important to have production related activities under the concept of agricultural development.

- The concept map of agricultural officers was focused mostly on marketing and financial assistance (35 %) and eco-concern (30 %).

- Among the activity statements enlisted under physical dimension of agricultural development, conservation of top soil was ranked first by progressive farmers and panchayat presidents. It was ranked as second by agricultural officers and as fifth in the list by scientists. Agricultural officers ranked the activity statements, self sufficiency in agricultural inputs like quality seeds, planting materials, fertilizers at local level, as first under physical dimension. Agricultural scientists rated construction of scientific and well planned markets as the most preferred one under this dimension.

- Formulation of integrated network of markets at district- state levels ensuring reasonable prices for agricultural products was ranked first by three groups of respondent groups, namely, panchayat presidents, agricultural officers and agricultural scientists. This activity statement was ranked second by progressive farmers. Progressive farmers considered insurance for agricultural crops on simpler terms as the most preferred activity statement under economic dimension.

- Both scientists and agricultural officers had prioritised awareness against excessive use of agro-chemicals in farming as the most important one under ecological dimension whereas farmers ranked integrated use of organic methods in farming as the most preferred activity statement. Panchayat president respondent group ranked yet another activity statement, practice of sustainable and eco-friendly farming practices, as the most important one.

- Under socio-psychological dimension, farmers, presidents and agricultural officers have ranked the same activity statement as the most preferred one. They emphasized on the need to encourage group farming. Agricultural scientists ranked this activity statement as third important activity in the list. Agricultural scientists preferred the activity statement ‘to assure deserving social status and respect to farmers’ as the most important one under this dimension.

- A model for agricultural development was constructed and constituted of ten most preferred activity statements among physical, economic, socio-psychological and ecological dimensions. A venn diagram was prepared as a pictoric representation of prioritised statements.

Implications of the study

The present study explored the perception gaps regarding the concept of agricultural development among progressive farmers, panchayat presidents, agricultural officers and agricultural scientists. The different conceptual focal areas were identified and visually depicted in the concept maps of respective respondent groups.

Due to the divergence in perception of the concept of agricultural development, the planning, execution and monitoring of different need based agricultural development programmes fail considerable without having an agreed upon approach. What one group considered as the most important activity under a dimension was not taken as such by other respondent groups. Hence preparing grounds to coordinate the needs and perception of the four major stakeholders shall genuinely produce creative solutions.

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APPENDICES

APPENDIX I
Open ended questionnaire

പ്രേഷിതൻ

ഡോ.ജോയ് മാത്യു
പ്രൊഫസർ ആന്റ് ഹെഡ്
സെന്ററൽ ട്രെയിനിംങ്ങ് ഇൻസ്റ്റിറ്റ്യൂട്ട്
മണ്ണുത്തി, തൃശ്ശൂർ

സ്വീകർത്താവ്

മാന്യസുഹൃത്തെ,

കേരള കാർഷിക സർവ്വകലാശാലയുടെ കീഴിലുള്ള ഹോർട്ടികൾച്ചർ കോളേജിലെ വിജ്ഞാനവ്യാപന വിഭാഗത്തിൽ ബിരുദാനന്തര ബിരുദ വിദ്യാർത്ഥിനിയായ മിസ്. ജാലിയ എം. കെ 'കേരള പശ്ചാത്തലത്തിൽ കാർഷിക വികസനം എന്ന സങ്കൽപ്പത്തിന്റെ നവീകരണം' എന്ന വിഷയത്തിൽ ഒരു പഠനം നടത്തുകയാണ്. വിവിധ മേഖലയിലുള്ള വിദഗ്ദ്ധരുടെ നിരീക്ഷണങ്ങൾ ക്രോഡീകരിച്ച് ഈ വിഷയത്തിൽ ഏകാഭിപ്രായം ഉണ്ടാക്കി വികസനത്തിന് പുതിയ ദിശാബോധം നൽകുകയാണ് ലക്ഷ്യം. കാർഷിക രംഗത്തെ കുറിച്ച് അങ്ങേക്കുള്ള വ്യക്തമായ കാഴ്ചപ്പാടുകളും ദീർഘനാളത്തെ അനുഭവവും പരിഗണിച്ച് പഠനത്തിന്റെ ആവശ്യത്തിലേക്കായി അങ്ങയുടെ വിലയേറിയ അഭിപ്രായങ്ങൾ ആരായുകയാണ്. തിരക്കേറിയ സമയത്തിൽ അൽപ്പം ഇതിനായി നീക്കി വച്ച് ചോദ്യാവലിയിലെ വിവിധ വിഷയങ്ങളെ കുറിച്ചുള്ള അങ്ങയുടെ സുചിന്തിതമായ തീരുമാനം രേഖപ്പെടുത്തി സഹകരിക്കണമെന്ന് വിനീതമായി അഭ്യർത്ഥിക്കുന്നു.

വിശ്വസ്തതയോടെ

മണ്ണുത്തി

ഡോ.ജോയ് മാത്യു

Appendix ii

Open ended questionnaire (English)

From

Dr. Joy Mathew

Professor and major advisor

Central Training Institute

Mannuthy, Thrissur

To

Dear

Ms. Jaliya M.K, postgraduate student of Agricultural Extension of College of Horticulture has undertaken a study entitled 'Re-orienting the concept of agricultural development in the context of Kerala' as a part of her M.Sc research programme under my guidance. Considering your vast experience and professional expertise, you have been identified as one of the expert respondents for this study. I request you to kindly spare some of your valuable time and express your opinion on various items included in the questionnaire. Your free and unbiased responses are of great value for the successful completion of this research programme.

Expecting your goodwill and whole hearted cooperation,

Yours faithfully,

Vellanikkara

Dr. Joy Mathew

Based on your knowledge and experience over the years and as a stakeholder in the process of development, how would you define agricultural development?

List down the different agricultural activities that can be listed under agricultural development

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APPENDIX III
Ranking schedule

കാർഷിക മേഖലയുടെ വിവിധ തലങ്ങളിൽ പ്രവർത്തിക്കുന്ന കാർഷിക ശാസ്ത്രജ്ഞരും ഉദ്യോഗസ്ഥരും ജനപ്രതിനിധികളും കർഷകരും അടങ്ങുന്ന പ്രാതിനിധ്യ സ്വഭാവമുള്ള തെരഞ്ഞെടുക്കപ്പെട്ട ഒരു വിദഗ്ധ സംഘത്തോട് കാർഷിക വികസനമെന്ന സങ്കൽപ്പത്തെ കുറിച്ച് ആരായുകയുണ്ടായി. വളരെ വിലയേറിയ ഒരുപാട് ആശയങ്ങളാണ് ലഭിച്ചത്. എന്നാൽ ഇടപെടുന്ന മേഖലകളുടെ പ്രത്യേകതകൾ കൊണ്ടും അനുഭവങ്ങളുടെ വൈവിധ്യം കൊണ്ടുമാവാം കുറെയെങ്കിലും വ്യത്യസ്തമായ ധാരണകളാണ് ഓരോ വിഭാഗത്തിനും ഉള്ളത് എന്നാണ് മനസ്സിലാക്കാൻ കഴിഞ്ഞത്. ഒരാശയപ്പൊരുത്തമുണ്ടാവേണ്ടത് ഈ രംഗത്ത് കൃത്യമായ ദിശാബോധമുണ്ടാക്കുന്നതിനും കർമ്മ പരിപാടികൾ ആസൂത്രണം ചെയ്ത് നടപ്പിലാക്കുന്നതിനും ആവശ്യമാണ്. അത്തരം ഒരു ആശയ ഏകോപനത്തിനുള്ള ശ്രമമാണ് ഇവിടെ നടത്തുന്നത്.

ലഭിച്ച നിർദ്ദേശങ്ങളുടെയും നിരീക്ഷണങ്ങളുടെയും വിദഗ്ധരുടെ റിപ്പോർട്ടുകളുടെയും അടിസ്ഥാനത്തിൽ കാർഷിക വികസനം എന്ന സങ്കൽപ്പത്തെ ഉത്പാദന-ഭൗതിക പ്രവൃത്തിരൂപരേഖ, പാരിസ്ഥിതിക പ്രവൃത്തിരൂപരേഖ, സാമൂഹികവും മാനസികവുമായ പ്രവൃത്തിരൂപരേഖ, സാമ്പത്തിക പ്രവൃത്തി രൂപരേഖ എന്നിങ്ങനെ നാലായി തരം തിരിക്കാനാണ് ഇവിടെ ശ്രമിച്ചിരിക്കുന്നത്. ഓരോ രൂപരേഖയുടെയും കീഴിൽ വരുന്ന പ്രവർത്തികളെ കൃത്യമായി വിലയിരുത്തി അവയ്ക്ക് നൽകേണ്ട പ്രാധാന്യത്തിന്റെ അടിസ്ഥാനത്തിൽ മുൻഗണനാക്രമത്തിൽ അങ്ങയുടെ സുചിന്തിതമായ അഭിപ്രായം രേഖപ്പെടുത്തണമെന്ന് അഭ്യർത്ഥിക്കുന്നു. കോളത്തിൽ ഏറ്റവും പ്രാധാന്യമുണ്ടെന്ന് കരുതുന്ന പ്രവർത്തിയുടെ നേരെ 1 എന്ന് രേഖപ്പെടുത്തുകയും പിന്നീട് പ്രാധാന്യമനുസരിച്ച് മറ്റ് പ്രവർത്തികൾക്ക് 2,3,4....എന്നിങ്ങനെ സ്ഥാനങ്ങൾ നൽകുകയുമാണ് ചെയ്യേണ്ടത്. രേഖപ്പെടുത്തിയ വിവരങ്ങൾ ഈ പഠനത്തിന്റെ ആവശ്യത്തിലേക്കായി മാത്രമേ വിനിയോഗിക്കുകയുള്ളൂ എന്ന് ഉറപ്പ് നൽകുന്നതിനോടൊപ്പം അങ്ങയുടെ ആത്മാർത്ഥമായ സഹകരണം അഭ്യർത്ഥിക്കുകയും ചെയ്യുന്നു.

ഉത്പാദന-ഭൗതിക പ്രവൃത്തിരൂപരേഖ		
ക്രമ നമ്പർ	പ്രവർത്തികൾ	റാങ്ക്
1	ജലസേചന സംവിധാനങ്ങളുടെ നിർമ്മാണം	
2	തദ്ദേശ ജലസംഭരണ സൗകര്യങ്ങളുടെ സംരക്ഷണവും വിപുലപ്പെടുത്തലും	
3	മേൽമണ്ണ് സംരക്ഷണം	
4	സസ്യ പരിക്ഷയ്ക്കാവശ്യമായ ഗ്രീൻഹൗസുകൾ, ഷെയ്ഡ് ഹൗസുകൾ എന്നിവുടെ നിർമ്മാണം	
5	ഗ്രാമീണതലത്തിൽ ശാസ്ത്രീയവും ആസൂത്രിതവുമായ വിപണിയുടെ നിർമ്മാണം	
6	ശാസ്ത്രീയവും സുസ്ഥിരവുമായ കൃഷിരീതികളുടെ പ്രചാരം	
7	അഗ്മാർക്ക് സർട്ടിഫിക്കേഷന്റെ പ്രചാരം	
8	കൃഷിസംബന്ധമായ മാസികകൾ, ടി. വി. പ്രോഗ്രാമുകൾ, ഫാം റിപ്പോർട്ടുകൾ തുടങ്ങിയവയുടെ ഫലപ്രദമായ ലഭ്യത ഉറപ്പാക്കുന്ന ഗ്രാമീണ കാർഷിക ലൈബ്രറിയുടെ ഉപയോഗം	
9	കൃത്യവും ഫലപ്രദവുമായ മണ്ണു പരിശോധന	
10	ഗുണമേൻമയുള്ള വിത്തുകൾ, നടീൽ വസ്തുക്കൾ, വളം, കാർഷിക ആവശ്യത്തിനുള്ള മറ്റ് നിവേശങ്ങൾ എന്നിവയുടെ ഗ്രാമീണ തലത്തിലുള്ള സ്വയം പര്യാപ്തത ഉറപ്പാക്കൽ	
11	പഴം പച്ചക്കറി തുടങ്ങിയ എളുപ്പം നശിച്ചു പോകുന്ന കാർഷിക ഉൽപന്നങ്ങളുടെ യഥാസമയത്തുള്ള സംസ്കരണത്തിന് ആവശ്യമായ ഭൗതിക-സാങ്കേതിക സംവിധാനം	
12	കാർഷിക ഉൽപന്നങ്ങൾ കേട് കൂടാതെ പ്രാദേശിക തലത്തിൽ സംഭരിക്കാനുള്ള സാങ്കേതിക സംവിധാനം	
13	തരിശ് ഭൂമിയുടെ വിനിയോഗം	
14	ജൈവ-അണുജീവി സമ്പത്ത് വർദ്ധിപ്പിച്ച് മണ്ണ് നന്നാക്കിയെടുക്കൽ	

സാമൂഹികവും മാനസികവുമായ പ്രവൃത്തിരൂപരേഖ		
ക്രമനമ്പർ	പ്രവർത്തികൾ	റാങ്ക്
1	വിദ്യാസമ്പന്നരായ യുവജനങ്ങളിൽ കൃഷിയോടുള്ള ആഭിമുഖ്യം ജനിപ്പിക്കാൻ ആവശ്യമായ ബോധവൽക്കരണ പരിപാടികൾ	
2	മുഴുവൻ സമയ കർഷകരല്ലാത്തവരിൽ ഒഴിവ്കാല കൃഷി അഥവാ 'ഞായറാഴ്ചക്കൃഷി' യുടെ പ്രോത്സാഹനം	
3	കൂട്ട്കൃഷിയെ പ്രോത്സാഹിപ്പിക്കൽ	
4	കാർഷിക മേഖലയിൽ തൊഴിൽ നഷ്ടപ്പെടുന്ന കർഷകത്തൊഴിലാളികളുടെ പുനരധിവാസവും പുന:പരിശീലനവും	
5	കർഷകർക്ക് അർഹമായ സ്ഥാനവും മാന്യതയും ഉറപ്പാക്കൽ	
6	ഉത്പാദകരും സംരംഭകരും തമ്മിലുള്ള വർദ്ധിച്ച ഏകോപനം	

പാരിസ്ഥിതിക പ്രവൃത്തിരൂപരേഖ		
ക്രമ നമ്പർ	പ്രവർത്തികൾ	റാങ്ക്
1	കാർഷികമേഖലയിലെ രാസവസ്തുക്കളുടെ അമിതപ്രയോഗത്തിനെതിരെയുള്ള ബോധവൽക്കരണം	
2	സുസ്ഥിരവും പരിസ്ഥിതിക്കനുയോജ്യവുമായ കൃഷിരീതികളുടെ പ്രചാരം	
3	കൃഷിയിൽ ജൈവിക മാർഗ്ഗങ്ങളുടെ സംയോജിത ഉപയോഗം	
4	തദ്ദേശ സസ്യജന്തുജാലങ്ങളുടെ ജനിതക ശുദ്ധി നിലനിറുത്താനുള്ള സംവിധാനം	
5	പുറംപോക്ക് തരിശ് ഭൂമികൾ ഏകോപിപ്പിച്ച് ജൈവ വൈവിധ്യം നിലനിറുത്തുന്നതിന് ആവശ്യമായ തദ്ദേശീയ സസ്യജാലങ്ങൾ നട്ട് സംരക്ഷിക്കുക	

സാമ്പത്തിക പ്രവൃത്തി രൂപരേഖ		
ക്രമ നമ്പർ	പ്രവത്തനങ്ങൾ	റാങ്ക്
1	കർഷക തൊഴിലാളികളുടെ ആവശ്യാനുസരണമുള്ള വിന്യാസം	
2	കാർഷിക വിളകൾക്ക് ലളിത വ്യവസ്ഥയിലുള്ള ഇൻഷൂറൻസ് പരിരക്ഷ	
3	കാർഷിക ഉൽപന്നങ്ങളുടെ വർദ്ധിച്ച തോതിലുള്ള മൂല്യവർദ്ധന സംവിധാനങ്ങൾ	
4	കാർഷിക ഉൽപന്നങ്ങൾക്ക് ന്യായവില ഉറപ്പാക്കത്തക്ക രീതിയിൽ ജില്ലാ-സംസ്ഥാന അടിസ്ഥാനത്തിലുള്ള വിപണിയുടെ സംയോജിത ശൃംഖല രൂപീകരിക്കൽ	
5	കാർഷിക ഉൽപന്നങ്ങളുടെ വില വസ്തുതാധിഷ്ഠിതമായി മുൻകൂട്ടി പ്രവചിക്കാനുള്ള സംവിധാനം	
6	ഓരോ വിളയ്ക്കും ന്യായവില ഉറപ്പാക്കത്തക്ക വിധത്തിലുള്ള വിപണന നയം രൂപീകരിക്കൽ	
7	നിവേശ ഉൽപന്നങ്ങളുടെ അനാരോഗ്യകരമായ വില വ്യതിയാനങ്ങളെ ഫലപ്രദമായി നിയന്ത്രിക്കുന്നതിനുള്ള സർക്കാർ ഇടപെടൽ	
8	ഫലപ്രദമായ ഉൽപന്ന സംഭരണ വിതരണ നയങ്ങളും സംവിധാനങ്ങളും രൂപപ്പെടുത്തൽ	
9	വിത്ത് മുതൽ വിളവ് വരെയുള്ള പ്രവർത്തനങ്ങളുടെ വിപണനാടിസ്ഥാനത്തിലുള്ള ഏകോപനം	

Appendix iv

Ranking schedule (English)

List of activity statements under physical dimension

Sl No.	Activity statement	RANK
1	Construction of irrigation facility	
2	Conservation and promotion of water harvesting structures at local level	
3	Conservation of top soil	
4	Construction of plant care structures like green house, shade house etc	
5	Construction of scientific and well planned markets	
6	Encouraging sustainable and scientific farming practices	
7	Promoting Agmark certification	
8	Access to local library with ample farm magazines, farm reports and TV programmes	
9	Precise and effective soil testing	
10	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables	
11	To develop infrastructural facilities for the storage of agricultural products at local level minimising post harvest loss	
12	Utilization of barren land	
13	To improve soil structure by increasing soil organic content and population of beneficial soil microbes	
14	Infrastructural and technical facilities to ensure timely processing of perishable agricultural commodities like fruits and vegetables	

List of activity statements under ecological dimension

Sl No.	Activity statements	RANK
1	Awareness against excessive use of agro-chemicals in farming	
2	Practice sustainable and eco-friendly farming practices	
3	Integrated use of organic methods in farming	
4	Conserving local natural biodiversity	
5	Utilizing barren lands for enriching conservation of local biodiversity	

List of activity statements under economic dimension

Sl No.	Activity statements	RANK
1	Supply of agricultural labourers as per farming requirement	
2	Insurance for agricultural crops on simpler terms	
3	Improved value addition of agricultural products	
4	Formation of integrated network of markets at district- state levels ensuring reasonable price for agricultural products	
5	Facilitity to forecast prices of agricultural products	
6	Formulation of marketing policies to ensure fair price for agricultural products	
7	Government intervention to control unexpected increase in prices of various agricultural inputs	
8	Devising policies facilitating effective storage and distribution of agricultural produce	
9	Market based integration of agricultural activities from seeding to harvesting the produce	

List of activity statements under socio-psychological dimension

Sl No.	Activity statements	RANK
1	To improve the attitude of educated youth towards farming	
2	To encourage ‘Sunday farming’ among non- farmers	
3	To encourage group farming	
4	To rehabilitate and train displaced agricultural labourers	
5	To assure deserving social status and respect to farmers	
6	To facilitate better linkages between producers and enterpreneurs	

REORIENTING THE CONCEPT OF AGRICULTURAL DEVELOPMENT IN THE CONTEXT OF KERALA

By

JALIYA M.K

ABSTRACT OF THE THESIS

Submitted in partial fulfilment of the requirement for the degree of

Master of Science in Agriculture

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ABSTRACT

India's agrarian culture and economy is in a progressive path of resurrection. The local administrative bodies are vested with increased powers to plan and execute need based development activities. Hence a clear understanding of the concept of agricultural development among the major stakeholders serves as a firm base for development. The present study entitled 'Reorienting the concept of agricultural development in the context of Kerala' was carried out in five blocks of Thrissur district, namely, Mullassery, Vadakkanchery, Chavakkad, Chowannur and Ollukkara. Progressive farmers, panchayat presidents, agricultural officers and agricultural scientists were the four groups of respondents selected for the study.

An open ended question was formulated to explore, explain and clarify the perceptions of these respondent groups on the concept of agricultural development. The perception differences among the respondent groups were visually depicted by using the tool of concept mapping. It is a type of structured conceptualization that can be used by groups to develop a conceptual framework that can guide evaluation or planning. A ranking schedule with four sub-sections namely, physical dimension, economic dimension, ecological dimension and socio-psychological dimension was prepared after discussing with agricultural experts and incorporating productive suggestions from the different respondent groups.

The Comparison of percentage mean scores between various respondent groups conducted after the analysis of the responses of open ended questions revealed that agricultural scientists scored the most (75 %) and farmers scored the least (36.3). The scores of agricultural officers and panchayat presidents were respectively 50 % and 41 %. The extent of perception differences among the four

respondent groups regarding the concept of agricultural development was significant when it was compared with the standard definition chosen for the purpose of the present study.

It was revealed from the study that the concept map of progressive farmers focused more on production related activities whereas concept map of panchayat presidents also followed suite except that it laid more importance on socio-concern. The concept map of agricultural officers was hinged on participatory approach and committed to social well-being of the society. The concept map of agricultural scientists stood out distinctly from the rest of the concept maps. The major emphasis was on marketing and finance assistance.

A model for agricultural development was constructed from ten most preferred activity statements ranked by the four respondent groups among physical, economic, socio-psychological and ecological dimensions. A venn diagram was prepared as a pictoric representation of prioritised statements.