SUSTAINABILITY OF TRIBAL DEVELOPMENT IN KERALA – A METHODOLOGICAL STUDY

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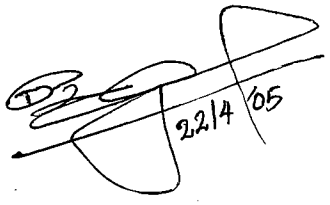
Dedicated to

The Loving Memory of My Father

DECLARATION

I hereby declare that this thesis entitled '**Sustainability of tribal development in Kerala – A methodological study**' is a bonafide record of research work done by me during the course of research and that the thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title, of any other university or society.



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Introduction

1. INTRODUCTION

India, a welfare state wedded to the idea of democratic socialism, aims at providing a minimum desirable standard of living to every citizen without any sort of discrimination. In order to meet this avowed objective, the whole developmental process is directed not only towards advancement of resources but also towards their equal distribution, so that every citizen of the country can get the fruits of development and his due share in the national wealth. This process involves protection of weaker and vulnerable sections of society by the State, in order to bring them closer to the normal living standard of their fellow citizens by overcoming their helplessness caused by their social and economic backwardness. Keeping this goal in view, various legislative and welfare measures for the upliftment of these sections have been envisaged in the Indian Constitution, in the form of various concessions and special benefits and protection to them to raise their position in the social ladder as well as their economic advancement.

Tribals constitute a different social group in view of their socio-cultural characteristics and geographical setting. Scheduled Tribes are the lowest strata of the Indian society. For generations, most of these communities were neglected by the rest of the nation. According to 2001 census, the tribal population in India was 84326240 which is about 8.19 per cent of the total population. The maximum concentration of tribals in India is in North-East regions like Chattisgar, Mizoram, Nagaland, Meghalaya, Arunachal Pradesh etc.

Tribals in India form the very segment of the weaker sections of the society with their traditional skills and resources. They have been living as homogenous groups in clearly identifiable but generally inaccessible, remote forest and hilly areas. Lack of social and economic infrastructural

facilities make their integration with the rest of the population poor. This natural isolation has deprived them of the fruits of development and scientific and technological advances on the one hand and it has led to their distinctive lifestyles, cultures and languages on the other hand. In fact, they are the most vulnerable section of the population and they are exploit of the age-old social and cultural handicaps coupled with environmental factors. These elements have contributed towards their lower level of living and various degrees of economic backwardness. Hence the constitution of India provide guarantee for the protection of the welfare of tribals under Articles 15(4), 46, 244(i) and 339.

In Kerala, tribal population is an important group among the socially and economically weaker sections of the population. According to 2001 Census Report the tribal population of Kerala is 364189, which is 1.14 per cent of the total population and the agricultural sector provides them with the main means of livelihood. In Kerala, the Tribal Sub Plan has remained as the main instrument for the development of Scheduled Tribes since 1974-75. It was envisaged that with the massive developmental efforts under the Tribal Sub Plan, it would be possible to raise at least 50 per cent of tribal families above the poverty line.

The planned efforts through different five year plans made towards the social and economic development of the tribals have not resulted in much perceptive changes in the living conditions of tribal population.

The approach and strategy for tribal development was reviewed comprehensively on the eve of the Fifth Five Year Plan. In order to tackle the development problems of Scheduled Tribes effectively, a comprehensive programme of development called Tribal Sub Plan (TSP) was launched which was intended (1) to take up family oriented beneficiary programmes in order to raise productivity levels of the beneficiary families in the field of agriculture, horticulture, animal husbandry, small scale industries etc. (2) to improve the quality of life

through education and training programmes and (3) to provide infrastructural facilities in tribal areas.

The Government of Kerala started to implement the TSP of Ninth Five Year Plan (1997-2002) through the Peoples Plan, as it includes the involvement of tribal people from plan formulation stage upto evaluation. The strategy adopted during Ninth plan is to earmark and give more than two third of the TSP funds as grant- in-aid to local bodies (Government of Kerala, 1999) for the purpose of formulating and implementing development programmes at grassroots level with the active participation of tribals. Even then, the benefits percolated to the tribals are not in proportion to the investment made and the question of sustainability of development still exists.

Development will affect the future of tribal people and the choice of technology and policies will heavily influence the sustainability of tribal livelihood. The available technology options developed by scientists and innovative and traditional tribal farmers should be carefully analysed and their economic, social and ecological impacts should be described.

Tribals with their varied agro-eco production systems and low socio-economic peculiarities are in urgent need of development with the objective of maximum sustainability in different dimensions like agricultural productivity enhancement, employment and income generation, participation, human resource development, capacity building, empowerment etc.

Need for the study

Scheduled Tribes form an important group among the weaker sections of the state. Their welfare and development are highly essential and for that Government of Kerala has implemented various development schemes under the Tribal Sub Plan. Inspite of the implementation of Tribal Sub Plan schemes by the Tribal Development Department, Local

Self Government and other development departments, the socio economic, cultural and educational progress made by the Schedule Tribe families is very meagre. A research investigation into the delineation of the dimensions of Sustainable Tribal Development, formulation of Sustainable Tribal Development Index, factors influencing the dimensions and the extent of inclusion of different dimensions in Tribal Development Programmes will enable the formulation of suitable measures to ensure the effective functioning of Tribal Sub Plan schemes for the Scheduled Tribe families.

Hence, a study of this kind is of immense necessity to further augment the Tribal Sub Plan schemes in a much more effective way and to do social justice to the most discarded sections of our society.

The present study comprises the following objectives :

1. To delineate the dimensions of sustainable development of tribals
2. To formulate a Sustainable Development Index (SDI) to measure the sustainability of tribal development in Kerala
3. To delineate the factors influencing Sustainable Tribal Development Index
4. To assess the extent of inclusion of dimensions of Sustainable Tribal Development in the selected tribal development programmes under Tribal Sub Plan implemented in Kerala for the period from 1997-2000.

Even though the State Planning Board, Kerala Institute for Research, Training and Development Studies for Scheduled Casts and Scheduled Tribes (KIRTADS) and Centre for Development Studies have conducted some studies regarding the tribal development, these studies were mostly exploratory in nature. Hence this study assumes particular significance in the light of the fact that this is a pioneering research attempt in this area.

Scope of the study

The concept of development despite decades of research and debate, still receives varying definitions. One can however accept the two broad definitions, first the development definition based or focused on growth of a quantitative and economic nature. Then secondly, development defined from an equity, social and cultural view point.

Sustainable tribal development points to the need for maintenance of "gained ground", avoiding collapse of success made, preventing retrogression into previous undesirable conditions and when this is done, to faster improvement of existing situations towards better levels of economic, social, cultural, physical and environmental status. Local level development initiatives should be able to maintain themselves and improve themselves if they are to be described as sustainable - a development that looks not just at the present but the future as well.

In this context, sustainable tribal development index proposed to be developed for the study will be of immense practical use in the tribal development strategy on a sustainable basis. Besides this being one of the pioneering research studies on different dimensions of sustainable development of tribals, the results will be of transcendal importance in providing a conceptual basis for planning effective tribal development programmes.

The scientific contributions of the study to the body of research methodology in social science in general and agricultural extension in particular will also be substantial. The delineation of personal, socio - psychological, economic and environmental factors influencing the sustainable development of tribals will be of phenomenal utility to those interested in research in these lines.

The results can be used to support the decisions made by tribal farmers, researchers and policy makers in their effort to secure sustainable development for tribals.

Limitations of the study

With a scheduled tribe population of 3.6 lakhs and 35 Scheduled Tribe Communities distributed in almost all the districts of the state, it was rather impossible to cover all the districts and all the Scheduled Tribe habitats or hamlets of the state. Considering the limited time and other resources available at the disposal of the student researcher, the study was limited to three districts namely Waynad, Idukki and Palakkad, the criteria for selection being the districts having largest scheduled tribe population and with largest fund spent under the Tribal Sub Plan scheme and to that extent generalization of the study is likely to be affected.

The variables of the study were also limited to a manageable size. Inspite of these limitations, much care has been taken to make the study as objective as possible. Moreover, since the study was based on the expressed opinion of the respondents, it may not be free from their individual biases and prejudices.

Theoretical Orientation

2. THEORETICAL ORIENTATION

A review of the existing literature on a topic helps the researcher to develop the theoretical framework for the study and assess the nature and quantum of research studies already undertaken in the area of his research. Keeping this in view, an attempt was made to review the related literature. The main objective of this chapter is to portray in broad out lines the conceptual frame of references that had been used for the study. This will provide a theoretical basis for the empirical investigation. It also assists in evaluating one's own research efforts by comparing them with the related efforts of others. The literature that appeared relevant are presented under the following heads.

2.1 Concept of development

2.2 Concept of sustainable development

2.3 Dimensions of sustainable development

2.4 Concept of tribe

2.5 Concept of sustainable tribal development

2.6 Concept of Tribal Sub- Plan (TSP)

2.7 Tribal sub- plan schemes implemented by Tribal Development Department and Local Self Governments

2.8 Evaluation of tribal development programmes

2.9 Sustainable tribal development index

2.10 Factors influencing the sustainable tribal development index

2.1 CONCEPT OF DEVELOPMENT

According to Webster's New Collegiate Dictionary (1975), development is defined as the process, or result of developing or advancing or state of being developed.

Haque *et al.* (1977) defined development as "a multivariate quantitative and qualitative change and may not be immediately measurable cardinally".

Development is a type of social change in which new ideas are introduced into a social system in order to produce higher per capita incomes and levels of living through more modern production methods and improved social organisation (Rogers and Shoemaker, 1971).

Burman (1981) reported that development activities particularly in the context of tribals should be concerned with:

a) satisfaction of minimum needs

b) control and management of productive resources

c) employment optimization

d) broad based participation of the population in development process and

e) socio cultural and political aspect of national integration

Vidyardhi (1981) observed that development means growth and change which includes both material and human - the socio cultural factors which are an integral part of the dynamics of growth. He felt while striving for the development of a group or an area, due emphasis had to be given to their traditional values of historical experience.

Joshi (1987) defined development as the modernization of the total structure, a process of social and economic change on which hinges the making of a community.

The UNDP (1992) formulated another indicator of development, shifting the emphasis to human development. From this perspective, development was defined as a process of enlarging people's choices. At all levels of development, three essential components of development were identified i.e., to lead a long and healthy life, to acquire knowledge and to have access o resources needed for a decent standard of living.

According to the report of UNDP (1992) Human development concerns all activities- from production process to institutional changes, to policy dialogues. It is development focused on people and their well-being. It is concerned with the generation of economic growth as with its distribution as concerned with basic needs as with the spectrum of human aspirations.

Development is fundamentally a process of change that involves the whole society- its economic, socio- cultural political and physical structures, as well as the value system and way of life of the people (Alexander, 1993). According to him, the concept of development can be viewed as a process of realizing certain goals or values such as improved health, improved housing, better nutrition, more communications, improved transportation and increased command over resources.

Development is not merely in terms of economic growth (GNP / GDP) but essentially of social development with emphasis on equitable distribution of resources, freedom of expression and qualitative aspects of life (Biswas, 1993).

"Human development covers all human choices in all societies at all stages of development". It broadens the development dialogue from discussion of mere means (GNP growth) to a discussion of ultimate ends" (Burnabas, 1993).

As per UNDP (1993) report, Human Development Indicators (HDI) were introduced in 1990. It combines indicators of national income, life

expectancy and educational attainment to give a composite measure of human progress. "HDI does not use nominal GNP, but adjust to reflect purchasing power. Educational attainment is measured by adult literacy and mean years of school. Life expectancy is an unadjusted indicator".

According to Mishra (1993) development involves a progressive transformation of economy and society. The satisfaction of human needs and aspiration is the major objective of development.

Chaudhary and Rajakutty (2000) reported that development aims at (i) increasing the opportunity of people with respect to health, knowledge and skill development, income and participation in decision making, (ii) creating conducive environments in reducing social and economic inequalities and (iii) bringing all present and potential natural resources to the most optimal use and at the same time striving for conservation and sustainable development.

Gupta (2001) reported that development is a long and complex revolutionary process - more a process of social change rather than merely generation and accumulation of economic resources. Development thinking has evolved into a broad spectrum realization that it must move beyond economic growth to include important social goals - reduced poverty, improved quality of life, enhanced opportunities for better education and health and more. Experience has also taught that sustainable progress towards these goals requires integrated implementation and must be firmly anchored in processes that are open, participatory and inclusive.

According to Taylor (2001) it is apparent that our current models of development are not working, especially when judged by the fundamental criteria of sustainability and equality.

2.2 CONCEPT OF SUSTAINABLE DEVELOPMENT

The term 'Sustainability' originates from the Latin word 'Sustinere' which means 'to hold up', 'to endure'.

Websters New Collegiate Dictionary (1975) describes sustainability as 'to give support' 'to keep up', 'prolong'. From these one can infer that the general meaning of sustainability is to maintain or support for a long period.

Pearce (1989) reported that sustainable development is combining the basic needs and self-reliance with ecological sustainability.

Menon (1991) reported that sustainable development encompasses not merely the allocation of a specific resources, e.g., land, for a specific exploitative use, but also a total value system, to be intelligently chosen by a community even at the sacrifice of immediate material advantages. The emphasis must be on land and forest and the tenure of human communities in such environments.

Sustainable development is defined by UNDP (1991) in its Human Development Report as "development that improves health care, education and social well being". Such human development is now recognized as critical to economic development and to early stabilization of population. It further states that "men, women and children must be the centre of attention with development woven around people and not people around development".

Human Development Report (1992) states that the minimum requirements for achieving sustainable development include : (i) the elimination of poverty (ii) more equitable distribution of resources (iii) healthier, more educated and better trained people (iv) more equitable liberal trading systems within and among countries, including increased production for local consumption and (v) better understanding of the diversity of the ecosystem, locally adapted solutions to environmental

problems and better monitoring of the environmental impact of development activities.

The PARENTAGE of the concept of Sustainable Development is attributed to the Report of the World Commission on Environment and Development (1987) entitled "Our Common Future" which defines it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Thus it seeks to satisfy the compulsions of equity within generations of the humans and also of inter- generational equity" (World Bank, 1992).

The World Development Report of World Bank (1992) says that sustainable development has many objectives. Raising per capita income is only one among many such objectives. Improving quality of life involves more specific goals : better health services, educational opportunities, greater participation in public life, a clean environment, inter generational equality and more.

Garforth (1993) stated that sustainability is not just a question of technology. There are important social, economical and institutional issues as well. From a social perspective, rural and agricultural development must provide sustainable livelihoods for households in rural areas particularly for those with limited resources and with little opportunity for non- agricultural employment or income. An economic perspective points to the need for farming system to generate sufficient returns to justify the resources used. Institutional issues focus on the ability of farmers including land, credit, nutrients, information and advices.

Sustainable development denotes the development of natural resources to meet the immediate needs of the present population without hampering the requirements of future generations as well as endangering the ecology and environment as such (Gupta and Gurjar 1993).

Ramakrishnan (1993) revealed that sustainable development aims at sustainable livelihoods for the weaker and vulnerable sections of the society. He also emphasized the need for efficiency in resources with equity and social justice. This implies strong community participation.

Ulluwishewa (1993) reported that the goal of sustainable development is lasting improvement in the quality of life and not just short-term improvements that disappear rapidly at the end of the project cycle. To achieve this goal technologies must be suited to the needs and abilities of people and the attitude and technical capabilities of people must change. Hence, the increased levels of education and decision making ability are important attributes of sustainability.

According to Seragaldin (1994) Vice President, World Bank reported that sustainable development is really the empowerment. Empowerment means to reach the poor and the marginalized sections of the society and give them opportunity to take charge of their own future and their own destiny. This is most suited to the tribals everywhere.

Carney (1998) reported that a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

2.2.1 Sustainable Development - Goals

Khanna (1993) reported the following constitutional pre conditions while working for the goal of sustainable development. They are equity and social justice, economic efficiency, ecological harmony and endogenous choices.

He also reported that the agenda for sustainable development ensures carrying capacity based development planning process, structural changes in economic sections, preventive environmental policy and environmental impact assessment.

Sundaram (1993) revealed that a sustainable development economy should serve the interest of three types of justice. They are :

- justice to people within a generation

-justice to people between the generations and

-justice to nature

All these three types of justice imply that sustainable development has to be conceived in a long term perspective and in the context of following goals.

-equity (within and between generation and to nature)

-survival (durability as well as resilience) and

-welfare improvement (raising average standard of welfare)

People and resources are the two key elements of development process and unless there is a balance between these two no development will be sustainable (Jain, 1993).

Mishra (1993) reported that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their emergent needs. It embraces two key concepts (1) the concept of 'needs' in particular the essential needs of the poor, to which overriding priority should be given and (ii) the idea of limitations imposed by the state of technology and social organization on the environments ability to meet the present and future.

He also reported that sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.

2.2.2 Sustainable Development– Perspectives

According to Seragaldin (1994), the Vice President of World Bank, sustainable development relates the view points of three different perspectives.

1. Economic 2. Ecologic 3. Social

Economic sustainability

The economic perspectives of sustainable development recognizes that whatever we are talking about in terms of sustainability has to be economically and financially sustainable in terms of growth, capital maintenance, efficiency of use of resources and investments.

But it also has to be ecologically sustainable.

Ecological sustainability includes

- Ecosystem integrity
- Carrying capacity
- Protection of biodiversity
- Natural resources

Social sustainability : includes

- Equity
- Social mobility
- Participation
- Empowerment
- Cultural identity
- Institutional development etc.

The social sustainability is more important than the other two. The neglect of social side leads to institutions that are incapable of responding to the needs of the society. In extreme cases, the societies become dysfunctional and disintegrate. In such circumstances when societies have neglected the social part of the developmental sustainability, there is no possibility of talking about either environmental protection or sound economic development. This is most suitable to the tribals everywhere.

2.3 DIMENSIONS OF SUSTAINABLE DEVELOPMENT

Khosla (1987) characterised sustainable development dimensions with factors like resource conserving, equitable, economically efficient, waste reducing, socially compatible, employment generating, self reliant and need fulfilling.

Brklaciah (1989) identified the elements of a sustainable production system as food sufficiency dimension, resource- stewardship dimension and producer - community dimension.

Virmani and Eswaran (1990) identified the dimensions of sustainability of farming system as technological feasibility, economic viability, political desirability, administrative manageability, social acceptability and environmental soundness.

Jayasree (1995) identified six important dimensions for sustainable agriculture *viz.*, resource use efficiency, environmental soundness, technological appropriateness, economic viability, economic feasibility and local adaptability. She also revealed that the extent of inclusion of the components of sustainable agriculture in the agricultural development programmes implemented in Kerala is only less than 25 per cent.

FAO (1997) reported that peoples participation approach will improve the poor's access to productive assets, allow them to participate in designing and implementing development programmes and foster their involvement in institutions from village to national level.

2.4 CONCEPT OF TRIBE

"The term tribes commonly signifies a group of people speaking a common language, observing uniform rules of social organization and working together for common purpose. Broadly, tribe is an aggregated group of people sharing social values, common dialect, territory and culture. But in a restricted sense, tribe means a group of people usually under a chief and maintaining distinct cultural traits" (Dubey, 1977).

A 'Tribe' is an anthropological concept. It is referred to by certain authors as "Animistic' or 'Aboriginal'.

Tribe may be defined as "a group of people speaking a common language, observing uniform rules of social organization and working together for common purposes such as trade, agriculture or welfare. Other typical characteristics include a common name of contiguous territory, a relatively uniform culture or way of life, and a tradition of common descent" (Verma, 1996).

A Scheduled Tribe is primarily an administrative and constitutional concept. It refers to a tribal community which is enlisted under Article 342 of the Indian Constitution.

2.4.1 Tribes in Kerala- An overview

As per 2001 Census Report, the tribal population in Kerala is 364189 which comes to 1.14 per cent of the total population of Kerala. Tribals are mostly concentrated on the districts of Wynad, Idukki, Palakkad, Kottayam and Trivandrum. In the case of tribal population, Wynad (37.36 per cent) stands first and Idukki (14.00 per cent) and Palakkad (10.89 per cent) comes second and third respectively. Thirty-five tribal communities in Kerala are presented in Table 1.

2.4.1.1 Sex Ratio

In 1977, the sex ratio of tribals in the state was 994 per 1000 males. But the sex ratio of tribal population as per 1991 Census was 996 females per 1000 males. The ratio varies widely when different communities are considered. In 25 communities the males constitute the majority. However sex ratio for 25 out of 35 communities can be deemed to be an indicator of a declining trend in the growth of tribal population.

2.4.1.2 Marital Status

On comprising the marital status of the tribals with that of the state population, it seems that the tribal males marry at an earlier age while the

Table 1. List of scheduled tribes in Kerala

1. Adiyan
2. Arandan
3. Eravalan
4. Hill Pulaya
5. Irular, Irulan
6. Kadar
7. Kammara (in the area compressing the Malabar District as specified by sub-selection)
8. Kanaikaran, Kanikar
9. Kattunayakan
10. Kochuvelan
11. Konda Kapuz
12. Kondaraddis
13. Koranga
14. Kota
15. Kudiya, Melakudi
16. Murichiyan
17. Kurumans
18. Kurumbas
19. Maha Malassar
20. Malai Aryan
21. Malai Vedan
22. Malai Pandaram
23. Malakkuravan
24. Malassar
25. Malayanayar
26. Malayan (excluding the areas comprising the Malabar District as specified by Sub-section (2) of section 5 of the State Re-organisation Act 1956 (37 pf 1956)
27. Mannan
28. Marati (in Hosdurg and Kasarkode taluks of Kasarkode district)
29. Muthuvan,Mudugan, Muduvan
30. Palleyan
31. Palliyan
32. Palliyar
33. Paniyan
34. Ulladan
35. Uraly

Other Eligible Communities

Communities eligible for Educational Concession normally allowed to Schedule Tribes

1. Allar (Alan) Throughout the State
2. Malayan (Konga Malayan, Pani Malayan (Malabar)
3. Malavettivan
4. Malamuthan
5. Kunduvadiyan
6. Pathiyan
7. Thachunatan Moopan
8. Karimpallan
9. Mavillan
10. Wayanadu kadar
11. Kalanadi
12. Chingathan
13. Malayalar
14. Malapanikar
15. Urindayan

age at marriage is not likely to differ considerably among the females in each tribe. Both males and females show wide variation in their marital status in the age group 20-24. The pattern of marital status may show significant variations when each community is considered.

Divorce and separation are very common among most of the communities in Wynad district especially in Adiyans and Paniyans. Separation is very rare and diverse are common among the Irulas of Palakkad (Report on Socio-economic Survey of Tribals in Kerala, 1976-78).

2.4.1.3 Average Household Size

Tribals have comparatively smaller families consisting of parents and children. The married sons or daughters living under the same roof may cook food separately constituting in dependent households. This is the usual practice among most of the tribals, especially those in northern parts of the state. Hence the average size of tribal household is comparatively smaller. Considering the tribals in the state as a whole household size works out to 4.83. But it varies from 3.9 to 6.44 when different communities are considered. In the case of 26 out of 35 communities, the average household size is between 4 and 5. Considering certain major communities, the average size in respect of the Paniyans workout to 4.5, Mala Aryans 5.5, Irulas 4.42 and Kurichians 5.45.

2.4.1.4 Occupational Status

Majority of the tribals in the state are residing in rural areas (96.51 %). The agricultural sector provides them with the main means of livelihood. Among the workers, 55.47 per cent depends on agriculture and 16.66 per cent constitute cultivators and remaining are distributed in various other occupations.

44.04 per cent of agricultural labourers are in Wynad district. In respect of cultivators, the ranking is Idukki (38.55 %), Wynad (21.48 %), Thiruvananthapuram (11.98 %) and Palakkad (11.03 %).

Types of workers by occupation

- Shifting cultivation
- Regular cultivation
- Agricultural labourers
- Livestock rearing
- Other household industries
- Collection of forest produces
- Household workers
- Employed in government/private services
- Food gathering
- Others

The tribals have the monopoly in the collection of minor forest produces. Food gathering, hunting and fishing supplement their income.

2.4.1.5 Economic Situation

In Kerala, 11 numbers of tribal communities are mainly depending on agriculture, since they had own cultivable land. Kurichiar, Kurumar and Mala Arayar comes under this category. Among these, Malayan and Kadar communities are cultivating in the forest land. Now they have become agricultural labourers since their land is alienated by others eg. Irular and Mudugar.

Adiyan, Paniyan, Iravalan, Hill Pulayan communities are mainly agricultural labourers. The 14 numbers of communities like Aranadan, Iravalan, Hill Pulayan, Kanikkar, Kattunaickan etc. are mainly dependent on forest produces.

Table 2 Number of tribal families living below poverty line (as per the family survey conducted by the Rural Development Department in October 1992)

Sl. No.	District	Total No. of Scheduled Tribe Families	No. of Schedule Tribe Families below Poverty line	Poverty Rate (%)
1.	Thiruvananthapuram	4059	2161	53.23
2.	Kollam	925	95	10.27
3.	Pathanamthitta	1647	722	43.83
4.	Alappuzha	651	47	7.21
5.	Kottayam	3999	749	18.72
6.	Idukki	11516	6422	55.76
7.	Ernakulam	1212	118	9.73
8.	Thrissur	967	430	44.46
9.	Malappuram	2363	1247	52.77
10.	Palakkad	8610	4571	53.08
11.	Wynad	23287	14063	60.38
12.	Kozhikode	1215	288	23.70
13.	Kannur	3635	196	5.39
14.	Kasargod	5355	2555	47.71
Total		**69441**	**33664**	**48.47**

Source : Rural Information Bureau, Rural Development Department

2.4.1.6 Social Situation

Table 2 shows that Wynad is the district where 60 per cent tribes are below poverty line and the average poverty rate of tribal family in the state is 48.47 per cent. As per the report of Kerala Saksharatha Samithy 1993, the total tribal literacy is 80 per cent in Kerala. Almost all tribal students are joining in the schools. But majority are dropouts. The tribal students in higher education is very low. Health and sanitation is very poor among the tribes. A study report of Kerala Institute for Research, Training and Development Studies of Scheduled Castes and Scheduled Tribes (KIRTADS) indicates that the infant mortality rate of Kurumbar and Paniyar communities are 280 and 178 respectively while the general infant mortality rate is 13 in Kerala. This shows poor social situation of tribes in Kerala.

2.5 CONCEPT OF SUSTAINABLE TRIBAL DEVELOPMENT

The very purpose of sustainability is sustaining the livelihoods of tribals. The concept of sustainable tribal development includes the following.

- Satisfying the basic needs of tribals
- Capacity of tribal society to satisfy the present and future needs.
- Development of tribals focused on growth of a qualitative and economic nature
- Development of tribals defined from an equity, social and cultural view point.

There must be a lasting improvements in the quality of tribal life and the development must be socially sustainable i.e. integrated into social system. Development programmes and technologies developed must be suited to the needs and abilities of the tribals which should be able to change the attitude and capabilities of tribals.

In order to achieve the goals of tribal development the important attributes like increased level of education and increased level of decision making ability and thereby their empowerment is highly essential.

Sustainable tribal development is co-terminous with freedom; it came to signify self-reliance and self-sustaining growth as the basis of self-determination (Prabhu, 1993).

Sustainable development has above all wide- ranging application to the human resources factor. It demands a reduction in fertility rates by increasing the literacy and education of women and girls. It demands a drastic reduction in the inefficiency and wastage in our schooling system expressed in the massive dropout rates and educated unemployment. It demands such a policy which is based on a dispersed pattern of human settlement, low coast water supply and housing and the recycling of waste. Above all it demands a positive approach to the major socio economic problems of unemployment (Mishra, 1993).

According to Prabhu (1993) Tribals are forest dwellers. Even today almost 90 per cent of them still live in forest tracts. Their intricate link with the forest as their *anna, aarogya, aasra* (food, well being, security) had been the basis of their symbiotic relationship, their physical and cultural survival. He also reported that as the modern management systems have failed, it is time to look at the tribal holistic, futuristic, ecologically sustainable and culturally specific modes of management and development as the new way with responsible stewardship of the renewal resources and capacity to determine their own future and the quality of life.

According to Ramakrishnan (1993) sustainable development of tribals can be achieved only through the traditional technology as the starting point.

He also stated that a holistic approach for sustainable development in the tribal area would link up agriculture, animal husbandry and

domestic sub systems of the village eco system in the overall context of forest ecosystem function and management.

Ramakrishnan (1993) reported that the approach for sustainable tribal development has to be built upon traditional technology and knowledge through modern scientific inputs, based on a value system with which the people can identify themselves and therefore participate effectively in the development process.

Tribals with their varied agro-eco production systems and low socio-economic peculiarities are in urgent need of development with the objective of maximum sustainability in different dimensions like productivity enhancement, employment generation, income generation, participation, capacity building, empowerment etc. Development will affect the future of tribal people and the choice of technology and policies will heavily influence the sustainability of tribal livelihood. Hence the available technology options developed by scientists and innovative, traditional farmers should be carefully analysed and their economic, social and ecological impacts should be described.

2.6 CONCEPT OF TRIBAL SUB-PLAN (TSP)

It is not surprising that the development of tribes in India has been the centre stage of its development planning since independence though the concept has been evolved from plan to plan. The approach and strategy for tribal development was reviewed comprehensively on the eve of the Fifth Five Year Plan. A committee popularly known as the Shilo Committee was already appointed for this purpose by the Planning Commission during the Fourth Plan. The committee had already recommended that the Tribal Development Blocks as instruments of tribal development were unsuitable to tackle the complex problems of tribals. It was also noted clearly that no single programme was adequate to resolve their problems. Further more, the situation in tribal areas in terms of

resources, target groups, infrastructural facilities, local priorities etc was entirely different from non-tribal areas.

To tackle the above mentioned problems effectively, a comprehensive programme of development called Tribal Sub Plan was prepared under the Fifth Five Year Plan. Accordingly all areas with more than 50 per cent tribal population were treated as sub-plan areas. A development block was taken as the smallest unit of development under this new strategy.

The tribal sub-plan approach includes:

a) Integrated Tribal Development Projects comprising generally administrative units like Sub Divisions/ Districts/ Tahsils/ Taluks with 50 per cent of more Scheduled Tribe population.

b) Pockets of tribal concentration having a total population of 10000 or more and a Scheduled Tribe population of 50 per cent or more.

c) Primitive Tribal Group Projects

The Tribal Sub-Plan has remained the main instrument, in recent times, for the development of Scheduled Tribes. From Sixth Plan onwards, primary importance has given to poverty alleviation among the Scheduled Tribes. It was envisaged that with the massive developmental efforts under the TSP, it would be possible to raise at least 50 per cent of the tribal families above the poverty line. It has sought to achieve this objective by providing adequate infrastructure, elimination of exploitation and removal of illiteracy.

2.6.1 Objectives of Tribal Sub-Plan

The major objectives of tribal sub-plan are as follows.

1) To take up family oriented beneficiary programmes in order to raise productivity levels of the beneficiary families in the field of agriculture, horticulture, animal husbandry, small scale industries etc.

2) To liberate tribals from the exploitation of land grabbing, money lending, debt-bondage, forest labour etc.

3) To improve the quality of life through education and training programmes and

4) To provide infrastructure facilities in tribal areas.

The tribal sub plan is financed through the resources drawn from

1) State Plans

2) Special Central Assistance of Ministry of Welfare

3) Central and Centrally sponsored programmes

4) Institutional Finance

2.6.2 Implementation of TSP Strategy in Kerala

The mode of implementation of TSP strategy launched during Five Year Plan was through comprehensive socio-economic development in consonance with the development of tribal areas as well.

Accordingly, considering the peculiar nature of the Scheduled Tribes concentration and to ensure effective co-ordination of development programmes, Integrated Tribal Development Projects (ITDP) were started during the Fifth Five Year Plan. The first ITDP was started in Attappady in Palakkad District by converting the Tribal Development Block – Attappady. Subsequently four more ITDPs *viz.,* Punalur, Idukki, Nilambur and Mananthavady were formed. These ITDPs were formed based on the proportion of ST population. Out of the total Scheduled Tribe population, 40.47 per cent was covered by these projects. These project areas were co-terminus with forest regions east-west. The number of ITDPs in the state now is seven. The number of Tribal Development Offices are eight. The Tribal Development Offices are expected to cover the tribal population living in dispersed tribal areas. Tribal Development Offices are at Punalur, Ranni, Moovattupuzha, Palakkad, Sulthan Batheri, Mananthavady, Thamarassery and Kasargod.

As a part of the decentralization of planning process in the state, District, Planning machinery was introduced in all the districts in 1979 and the District Collectors were assigned the tasks of plan formulation and implementation at the district level.

Later being the part of decentralization, as per GO (MS) No. 27/83/P&EA dt 16/4/83, District Level Working Group (DLWG) was constituted for the formulation and implementation of TSP. District Collector is the Chairman of DLWG. The DLWGs were vested with very high financial and administrative powers. The DLWGs and the ITDP interacted and laised in such a manner that the schemes prepared by the sectoral district level officers gave emphasis to the ITDP areas with focus on tribal communities and individual families.

2.6.3 Need for Pooling of TSP Funds

Till 1995-96, the Planning and Economic Affairs Department, Government of Kerala was vested with the nodel role for the formulation and implementation of TSP in the state. Soon after the budget is passed, the Planning Department issues a districtwise break up of TSP funds in which nearly 75 per cent of TSP funds are allotted to the district. Once funds are available, the district level officers of the sectoral department prepare action plan for their schemes/ programmes under TSP and Place before the DLWG for administrative sanction (AS). The technical sanction (TS) will be given by the concerned Department itself. For preparing the action plan, joint field visit, data collection, assessment of needs in tribal settlements/households etc are conducted.

Tribal population, tribal population in ITDP areas, tribals engaged in agriculture sector, tribals benefited by land reforms, tribals engaged in various occupations in different sector, number of tribal habitats/colonies etc were the broad criteria for allocation of funds to the districts under various sectors. The expenditure incurred for tribal development in the state for the period from 1975 to 1997 is depicted in Table 3.

Table 3 Expenditure on development of Scheduled Tribes in Kerala: 1975-'76 to 1996-'97 (Rs. in lakhs)

Year	Through ST Development Dept. (Plan & Non-plan)	Through other Departments under General Sector Schemes (TSP)	Total
1975-`76	93.120	39.939	133.059
1976-`77	116.385	117.120	233.505
1977-`78	122.779	244.389	367.168
1978-`79	153.220	231.142	384.362
1979-`80	155.388	579.033	734.421
1980-`81	155.082	1112.411	1375.493
1981-`82	295.761	273.370	569.131
1982-`83	284.614	318.727	603.34
1983-`84	344.597	446.288	790.885
1984-`85	377.920	553.073	930.993
1985-`86	501.944	624.482	1126.426
1986-`87	554.332	728.630	1282.962
1987-`88	636.456	662.579	1299.035
1988-`89	703.210	730.000	1433.210
1989-`90	798.601	987.760	1786.361
1990-`91	871.262	1020.550	1891.812
1991-`92	1123.330	1479.360	2602.690
1992-`93	1362.903	1241.980	2568.488
1993-`94	1534.818	1675.670	3210.488
1994-`95	1633.905	1893.640	3527.545
1995-`96	2303.112	2296.727	4599.839
1996-`97	2303.635	2965.320	5268.955
Total	**16426.37**	**20222.19**	**36720.17**

Source : Tribal Sub-Plan, Kerala, 2000, Department of Scheduled Tribe Development, Government of Kerala

2.7 TRIBAL SUB-PLAN SCHEMES IMPLEMENTED BY SCHEDULED TRIBES DEVELOPMENT DEPARTMENT AND LOCAL SELF GOVERNMENT

2.7.1 Schemes of Scheduled Tribes Development Department

2.7.1.1 State Level Schemes

2.7.1.1.1 Economic Development Programmes

1. Share capital contribution to Kerala State Development Corporation for Scheduled Castes and Scheduled Tribes

2. Assistance to Public Sector Undertakings

Assistance to Priyadarshini Tea Estates, Wayanad

" Sungandhagiri Cardamom Project

" Pookkot Dairy Project

" Attappadi Co-operative Farming Society, Palakkad

" Tribal Collective Farm, Vattachira, Kozhikode

" Scheduled Tribe Co-operative Societies

" Ambedkar Memorial Rural Institute for Development

2.7.1.1.2 Education

Tribal Hostels

Grants to high school students and students failed in SSLC/Plus Two for studying in tutorials

Model Residential Schools

Ashram schools for primitive tribes

Incentive to specially talented tribal youths in arts and sports

Bharat Darsan

2.7.1.1.3 Heath

Health projects in Wayanad, Attappadi and Idukki

2.7.1.1.4 Other schemes

District / state level youth festivals

Enforcement on prevention on Atrocities Act

Implementation of Kerala State Restriction in Transfer of Lands and Restoration of Alienated Land Act, 1975

Food support programme

Package programme for Adiyans, Paniyans and primitive tribal groups

Rehabilitation of tribal purampokku dwellers

Social activists

Award of research fellowship

Vocational training institute for tribes

KIRTADS

Adikalagramam

2.7.1.2 Local Self Government's Schemes

Education

Housing

Rehabilitation of landless/houseless ST families

Assistance to ST Mahilasamajams / voluntary organizations

Assistance for marriage of ST girls

Infrastructure development schemes

Employment and income generating schemes

2.7.1.2.1 Strategy of TSP Implementation under Local Self Governments in Kerala

Distribution of TSP funds as grant-in-aid to LSG institutions and the physical achievements of various selected schemes for the period from 1997 to 2000 is presented in Tables 4, 5, 6, 7 and 8.

Table 4. Distribution of grant in aid to LSG institutions (Rs in crores)

LSG institutions	No. of local bodies	1997-98		1198-99		1999-2000		Total TSP (1997-2000)
		General	TSP	General	TSP	General	TSP	
Grama Panchayat	990	307.02	7.62	426.02	15.31	464.10	19.88	43.11
Block Panchayat	152	65.79	7.62	91.29	7.66	99.45	7.95	23.23
District Panchayat	14	65.79	22.87	91.29	15.31	99.45	11.93	50.11
Muncipalities	55	49.54	0.65	71.18	0.54	77.51	0.24	1.43
Corporation	3	27.86	0.24	36.22	0.18	39.49	-	0.42
Total	**1214**	**516.00**	**39.00**	**716**	**39.00**	**780.00**	**40.00**	**118.00**

Source: Economic Review 1998, 1999, 2000

Table 5 Budget allocation to selected Local Self Government Institutions in Wayanad district, Rs. in lakhs

Name of panchayats	1997-98		1998-99		1999-2000	
	General	TSP	General	TSP	General	TSP
Wayanad district panchayat	171.48	820.51	441.61	549.73	450.00	428.27
Mananthavadi block panchayat	54.44	99.57	91.35	99.82	99.60	103.60
Thirunelli grama panchayat	28.95	22.66	55.85	44.71	63.98	48.33
Sulthanbatheri block panchayat	65.91	107.78	112.61	108.04	122.78	112.13
Noolpuzha grama panchayat	28.49	22.11	57.11	43.63	65.43	47.16
Kalpatta block panchayat	51.12	67.02	87.48	67.19	95.38	69.73
Kaniyanpetta grama panchayat	30.05	12.85	39.47	25.36	45.22	27.41
Total	**430.44**	**1152.5**	**885.48**	**938.48**	**942.39**	**836.63**

Source: Details of provisions earmarked to Panchayat Raj / Nagarapalika Institutions in the budget for 1997-98, 98-99 and 99-2000

Table 6 Budget allocation to selected Local Self Government Institutions in Palakkad district, Rs. in lakhs

Name of panchayats	1997-98		1998-99		1999-2000	
	General	TSP	General	TSP	General	TSP
Palakkad district panchayat	566.09	257.40	856.03	172.29	878.62	134.25
Attappadi block panchayat	16.38	59.07	39.21	59.20	42.75	61.45
Agali grama panchayat	40.29	23.54	54.18	46.44	61.36	50.42
Chittoor block panchayat	39.55	8.69	68.78	8.71	75.00	9.04
Perumatti grama panchayat	34.08	4.33	57.50	8.55	65.13	9.28
Kollengode block panchayat	31.65	6.37	46.56	6.38	50.77	6.63
Muthalamada grama panchayat	41.76	5.94	84.38	11.72	91.10	12.67
Total	**769.8**	**365.34**	**1206.64**	**313.29**	**1264.73**	**283.74**

Source: Details of provisions earmarked to Panchayat Raj / Nagarapalika Institutions in the budget for 1997-98, 98-99 and 99-2000

Table 7 Budget allocation to selected Local Self Government Institutions in Idukki district, Rs. in lakhs

Name of panchayats	1997-98		1998-99		1999-2000	
	General	TSP	General	TSP	General	TSP
Idukki district panchayat	274.36	365.17	480.20	244.32	485.00	190.38
Elamdesom block panchayat	31.06	25.08	43.13	25.14	47.09	26.10
Velliyamattom grama panchayat	24.19	11.47	27.91	22.64	32.35	24.51
Devikulam block panchayat	33.74	30.09	73.70	30.16	80.35	31.30
Kanthalloor grama panchayat	12.63	9.33	18.68	18.41	21.65	19.92
Idukki block panchayat	33.78	24.96	64.98	25.02	70.85	25.97
Arakkulam grama panchayat	29.40	13.10	40.35	25.84	46.77	27.96
Total	**439.16**	**479.2**	**748.95**	**391.53**	**784.06**	**346.14**

Source: Details of provisions earmarked to Panchayat Raj / Nagarapalika Institutions in the budget for 1997-98, 98-99 and 99-2000

Table 8 Selected physical achievements of LSG under TSP - 1997-2000

Sl. No.	Items	Units	Achievements			Total
			1997-98	1998-99	1999-2000	
1	Additional area under cultivation	Acre	5510	3076	2673	11259
2	Beneficiaries of seeds/ fertilizers/ pesticide	No	12835	13991	15913	42739
3	Tillers supplied	No	161	62	0	223
4	Cattle distributed	No	4015	5088	1417	10520
5	Chicken distributed	No	14414	7844	2047	24305
6	Cattle sheds	No	254	560	233	1047
7	Sewing machine	No	344	333	55	732
8	Persons trained	No	404	590	359	1353
9	Houses constructed	No	3324	4707	6102	14133
10	Plots allotted	No	197	175	343	715
11	Houses repaid	No	1867	2577	2190	6634
12	Toilets constructed	No	3497	3356	2714	9567
13	House wiring	No				
14	Wells	No	1637	1967	973	4577

Table 8 Continued

Sl. No.	Items	Units	Achievements			Total
			1997-98	1998-99	1999-2000	
16	Ponds distilled	No	80	89	46	218
17	Pumpset	No	178	351	338	867
18	Roads constructed	No	209	203	253	665
19	Length of road	Km	230	931	253	1414
20	Bridges	No	31	15	13	61
21	Co-operatives formed	Area	14	629	14	43
22	New school built area	Square	3112	1282	421	4162
23	Hospital building area	Area	550	957	310	2142
24	Office building	Number	130	0	613	1694
25	Marketing complex	Number	7	0	1	8

(Source: Economic Review 1998, 1999, 2000)

2.8 EVALUATION OF TRIBAL DEVELOPMENT PROGRAMMES

According to Barakataky and Gohain (1970) the pace of expected tribal development was not upto the mark due to certain institutional behaviour like belief, customs and practices.

Even if tribes are favourably disposed of toward innovations, their socio-economic and cultural barriers diter them for translating the innovations into action (Sushama, 1979).

Nagadevara and Gopalaswamy (1985) observed that there was significant increase in soil conservation measures, cropping intensity, crop field and establishment of fruit orchards due to ITDP.

According to Viju (1985) it is possible to improve the farming and consequently the socio-economic conditions of tribals by systematic education and dedicated extension work.

Kokate *et al.* (1988) reported that traditional belief was the bottle neck in the adoption of improved practices in agriculture and dairy.

Barnabas (1989) observed that tribal development has had a negative impact on the status of tribal women.

According to Chakrabarty *et al.* (1989) absence of attitudinal change, attachment towards traditional heritage failed to influence tribal farmers in generating increased level of employment.

In a rehabilitation study, Chaudhary (1992) reported that land based and employment based rehabilitation programmes were noted to be the ideal one.

Jaleel (1992) reported that tribal farmers must involve and given orientation in development programmes whenever a new development programme is launched in tribal areas.

Free supply of coconut seedlings and fertilizers to the SC/ST beneficiaries could not evoke interest among them and it perished totally (KIRTADS, 1994).

Singh *et al* (1995) reported that the watershed management programme has not only increased the crop yield but also developed fodder resources in the tribal area. The percapita income has gone up from Rs. 598 to Rs. 1739 and the average benefit cost ratio worked out to be 1.76:1 which indicates the economic feasibility of watershed management programme for improving the socio economic status of farmers residing in the tribal areas.

Jamatia (1999) observed that 92.67 per cent of tribal women were aware of the existing developmental programmes and 77.33 per cent of tribal women had participated in the various developmental programmes.

Lakshmaiah (1999) reported the importance of regeneration of natural resources by involving tribal people as stakeholders for sustainable development. He also reported that watershed approach to the development of tribal area including rural area has become a potential strategy to sustain resource base in the country.

Nagda (1999) reported that the tribal people know lot about the local ecosystem and ways of proper utilisation of natural resources for their day to day survival .He also reported that Tribal Sub-Plan programmes can become vibrant and popular if the traditional and elected bodies at various levels of plan formulation and implementation co-operate with each other.

Saraswathi *et al* (2000) revealed that medium level of participation of tribals in tribal development programme is due to the fact that the tribals have neither considered some of the programmes as applicable to their conditions nor feasible for them. They also emphasised the need for organising co-operative farming among the tribals.

2.9 SUSTAINABLE TRIBAL DEVELOPMENT INDEX

The term index has been defined by different authors in connection with various fields of activities.

Theodorson and Theodorson (1969) defined index as any measurable or observable phenomena that is used to indicate the presence of another phenomens, that cannot be measured directly or conveniently.

According to them indicator refers to a single measure of an observable phenomenon, reserving the term index for a more complex combination of indicators.

Singh *et al.* (1972) reported agricultural progressiveness as a strong indicator of rural development.

Singh (1973) opined that progressiveness of individual refers to higher receptivity of modern values and practices.

Wolman (1973) stated that an index is a sign or number indicative of change in magnitude or point to a state of fact.

Hence it may be concluded that index is the indicant and indicator is the signal or measure.

Ganguli and Gupta (1976) analysed the levels of living by means of set of indicators classified into 8 components 1) nutrition 2) housing 3) medical care 4) education 5) clothing 6) leisure 7) security and 8) environmental.

Balakrishna *et al.* (1982) identified 14 indicators of village development *viz.*, food and nutrition, clothing and footwear, housing, possessions, savings and investments, employment and wages, agriculture, transport and communication, recreation and cultural activities, participation, education, health, community level amenities and status of women.

Pachauri (1984) opined that for measuring rural development and the sources of welfare programmes, there are always certain indicators, which can be utilized for measuring changes in a rural economy. According to him, the basic indicators are agriculture, health and education.

Sharma and Sastri (1984) observed that a development index described trends, diagnoses a particular development situation and evaluates the progress.

Keigsper (1986) used three forms of indicator as evaluation criteria for a developmental study in Bangladesh. They are cultural emancipation by means of non formal education, political emancipation by means of organizations and economic emancipation by means of access to means of production.

2.9.1 Dimensions of Sustainable Tribal Development

2.9.1.1 Economic Sustainability

1.Control over land resources

According to Mathur (1977) land is society-linked with the perpetuation of groups of tribal people with their autonomy, solidarity and cohesion. Land is useful to them in several ways such as source of food gathering and hunting and also as a people to live in and work.

According to Burman (1981) control and management of productive resources is an important issue and it has been advised by the experts that tribal rights over land and forest should be protected. He also reported that the basic feature of tribal subsistence system is their organization by the community and a clear tendency for community control and collective management of economic resources, with due respect to and balanced interaction with nature.

Sharma (1990) reported that unless there is a basic change in the present system such that all matters concerning land are decided in open, in the presence of village people, the tribal people cannot get justice.

Kirtikumar (1992) viewed that it is extremely important to undertake and implement effectively land reforms that would allow for an equitable distribution of land. To the extend they are given ownership and effective possession of land with all the necessities and facilities particularly of irrigation, good seeds, fertilizers and credit for efficient production, the economic and social dependents and low status imposed on them by the land owning classes can be removed. It will not only promote self respect and dignity among them but will also result in enhancement of bargaining power of agricultural labour left in wage market.

Burman (1993) reported that land reform is often viewed as an instrument primarily for the achievement of greater equity and social justice. Land reforms has an essential core meaning which concerns significant and purposeful changes in land tenure, changes in ownership and control of land and water resources.

The honour and dignity of a person is dependent on his work, his right over means of production and his right to manage the system (Sharma, 1993).

Singh and Shimray (2001) reported that in the case of Adivasi Indigenous People, the correct model of Protected Areas (PAs), while used for wild life conservation, was considered a threat to livelihood rights and therefore a new model which focuses on traditional resource rights and central management role for communities along with biodiversity conservation principle is needed.

2.Employment and Income Generation

In a tribal rehabilitation study, Chaudhary (1992) reported that land based and employment based rehabilitation programmes were noted to be the ideal ones.

According to Kirtikumar (1992) the SCs and STs are engaged in traditional and low remunerative avocations. It is very essential to modernize them and provide them with alternative jobs. They should be helpful to attain occupational mobility horizontally as well as vertically.

Jain (1993) reported that our experience of nearly four decades of planning clearly shows that employment cannot be just a bye product but will have to be planned on a massive scale, starting with the unskilled labour force in rural areas and those who can be employed in agricultural and allied activities, simultaneously planning to impart training for a variety of skills that would be needed in a developing economy. This approach requires an in-built mechanism to sustainable development. It also requires appropriate linkage with local level institutions so that a wholesome mobilization process could be better.

3. Control over minor forest produces

Since the tribal people are closely associated with the protection, regeneration and development of forests, they must be allowed for optimum collection of minor forest produces along with institutional arrangements for the marketing of such produces (Gaikwad, 1986).

Mahalingam (1989) reported that tribal economy is closely connected with forest. It is estimated that minor forest produce collection, processing and marketing can generate a gainful employment of 10 million standard persons per year. Their life is therefore inextricably linked with the collection of minor forest produces and hence they must be given more control over them for their subsistence.

4.Agricultural Productivity Optimization

Fernandez (1992) proposed a framework for sustainable agricultural development on the following features – it must be economically viable, ecologically sound, socially just and humane (respects human dignity participatory and equitable), culturally appropriate (respects traditions, values, beliefs and culture of people) and grounded in holistic science (integrative and non-reductionist).

Garforth (1993) stated that from a social perspective, rural and agricultural development must provide sustainable livelihoods for household in rural areas particularly for those with few resources and little opportunity for non-agricultural employment and income. An economic perspective points to the need for farming system to generate sufficient returns to justify the resources used. Institutional issues focus on the ability of farmers including land, credit, nutrient, information and advices.

As far as sustainable tribal development is concerned, three essential elements are required which should ensure growth with equity and environmental sustenance. The first, is the growth of agriculture and increased production, which is the key to bring the development and change, secondly, the development of agriculture requires simultaneous development of secondary and tertiary sectors and thirdly the involvement of people right from the decision making to the level of sharing the benefits (Jahagirdar, 1993).

According to Jain (1993), agricultural growth not only contribute to the overall growth of the economy but it must be sustainable as well. Hence the following are advocated in agricultural development 1) A sound resource base in agriculture, 2) Slow rate of growth of rural population 3) Optimum productivity in agriculture, 4) Infrastructure development.

2.9.1.2 Social Sustainability

1. Food Security

The conference of World Science Academies (Kanwar, 1997) recognized the following dimensions of food security.

Physical, economical and environmental access to balanced diets to enable individual to live a healthy and productive life.

The food security rests on most efficient use of natural resources of land, water, energy and plant diversity.

The physical dimensions of food and nutritional security will involve a transition from the present chemical and unchemical intensive to knowledge intensive and eco-friendly practices.

Sen (1981) reported that poverty is the major determinant of chronic household food insecurity; the poor do not have adequate means or 'entitlements' to secure their access to food even when the food is available in local or regional market.

World Bank (1986) defined food security as access by all people at all times to enough food for an active, healthy life. The essential elements of this definition are the emphasis on both the demand (access) and the supply (availability) of food. According to World Bank (1986) there are two kinds of food insecurity, chronic and transitory. Chronic food insecurity is a persistently inadequate diet caused by the continual inability of the households to acquire food either through market purchases or through production. Transitory food insecurity is a temporary decline in household's access to enough food. For individuals, food security at the household level is crucial.

Sahn and van Braun (1987) reported that variables in national, regional or local availability of food can contribute to food security.

van Braun and Pandya-Lorch (1991) found that food insecure households tend to be larger and have a high number of dependents and have a younger age composition. Ownership of land or access to even small pieces of land for farming had a substantial impact on the food security status of rural households.

According to FAO (1992) a household is said to be food secure when it has access to food needed for a healthy life for all its members and when it is not at undue risk of losing such access.

Kannan (1999) is of the view that the most important protective social security in Kerala is the food security system which has three components viz., the public distribution system for all households, the supplementary nutrition programme for children in the age group of 0-4 and 5-12 and the old age pension for the poor sections.

Krishnakumar (2000) is of the opinion that food security of Kerala can be detected by measuring nutritional status of the population especially of the vulnerable sections.

Sarkar (2000) defined food security as "access by all people at all times, to the food needed for a healthy life".

Kannan (2001) observed that as in the case of several developmental indicators, the state of Kerala presents an interesting case in the matter of food security. While Kerala has a lower level of average intake of food among other states, it is in the forefront in such food security indicators as poverty, infant mortality and life expectancy. As per 45th round of NSS 1993-94, the share of households having two square meals a day was found to be the lowest in Kerala.

Suryanarayana (2001) opined that with high levels of poverty and inadequate domestic food grain production, Kerala is one of the most food insecure state in India and 80 per cent of the population suffer from inadequate calorie intake.

Household food security in broader terms as explained by Varma (2001) means that an individual and also the household have access to sufficient food both in quantity and quality to meet the nutritional requirement of all its members.

According to Swaminathan (2002), "bridging the nutritional divide is the first requisite for a more equitable and humane world".

2.Housing security

Report of the research project sponsored by Government of India (1992) revealed that the extremely poor quality of the houses of tribals is due to the fact that the values of the houses were below Rs. 5000/- only and the report revealed the importance of housing security to tribals for their sustainable development.

Sharma (1993) reported that separate housing facilities should be provided to the local tribal labour and it should be looked after by their own people. Local tribal leaders should be involved in managing these affairs.

3. Human resource development

Prasad (1986) reported that the need for tribal educational development assumes prime importance to save them from economic exploitation and to help them in their all round development.

According to Sharma (1986) the designing of educational policy in tribal area should consider the social life, economic system and spatial setting of the tribal people. He also reported that much of the rich oral tradition which gives the tribal people a sense of their history, cultural moorings and value frame is being lost in the process of present educational system.

4. Health and nutritional security

Sustainable Nutrition Security is defined as providing physical and economic access to balanced diets and safe drinking water to all people at all times (Swaminathan 1995).

5.Participation

Baetiz (1975) observed that participation in development means how community members can be assured the opportunity of contributing to the creation of the community's goods and services.

According to UNO (1979) participation means sharing by people the benefits of development, active contribution by people to development and involvement of people in decision making of all levels of society.

Paul (1987) defined participation as in the context of development, community participation which refers to an active process whereby beneficiaries influence the direction and execution of development projects rather than merely receive a mere share of project benefits.

Trivedi (1988) in a tribal study reported that the real concern should be to instill development instinct in the minds of beneficiary households. The issue at stake is to prepare the tribal society for becoming an active participant in the development relay-race.

The experiences indicate that despite initiatives taken by the government to help rural people and reduced the incidence of poverty. Many of the programmes could not yield desired results, mainly due to lack of participation and well organized institutional support, particularly at the grass-root level (Jain, 1993).

Santhanam (1993) reported that community participation implies sustainable development with the people and not just for the people. He also reported that if development is to be sustainable it must be participatory and community based. The development initiatives should be based on the needs identified by local people, involve them in the

designing and implementation of the projects using principles and techniques suited to local conditions. This process would include all sections of the community, especially women.

According to UNDP (1993) participation refers to close involvement of people in the economic, social, cultural and political process, that affect their lives. People may in some cases, have complete and direct control over these process, in other cases, the control may be partial or direct. The important thing is that people have constant access to decision making and power.

FAO (1997) observed that people centered approach will improve the poor's access to productive assets allow them to participate in designing and implementing development programmes and faster their involvement in institutions from village to national level.

6. Ethno-development

The widespread nature of the tribal problem pointed out some harsh realities. First, the official machinery has neither the will nor resources to meet its constitutional obligations to ensure tribal development. Secondly, the concept of equality of opportunity when applied to development is impractical in an inherently unequal society, where class and regional elites have monopolished its fruits. In this situation, instead of thinking in idealistic terms of dismantling the entire structure, we have to think how to regulate it. The answer lies in ethno development with authentic self-determination.

According to Prabhu (1993) sustainable integral tribal development is synonymous with ethno development. Broadly speaking, ethno development is the practical manifestation of internal self determination which is essentially in conformity with the constitutional gerunds. Ethno implies respect for peoples, societies and cultures and their wishes and desires while development refers to a total phenomenon combining,

economics, politics and culture in an all encompassing whole, defined by the concerned people themselves.

Ethno development means control of the ethnic over its land resources, social organisation and culture, it implies that the tribal ethnics have the right to freely negotiate with the state the kind of relationship they individually wish to have (Stavenhagen, 1992).

Ethno development of tribals pleads that they have the right to choose what to conserve and what to change, what to adopt and what to reject from other cultures and all these in what pace and intensity in this fast changing world.

Basic principles of ethno development

The basic tenets of ethno development would include :

Self sufficiency : In order to achieve this, it is necessary to revive models of technology and systems of knowledge so as to integrate them with the modern system.

Social justice : This demands that they are the subjects of their present and future development.

Prioritisation and participation : Control of their development according to their priorities, values and customs with full participation in the actual process of planning and implementation.

Decentralisation : Decentralisation with the village or hamlet at the centre, with a revival of their traditional systems of community management.

Ecological equilibrium : Ecological equilibrium or environmentally sensitive development which has been the corner stone of tribal people anywhere in the world.

Homan (1961) refers this to a theory of distributive justice. The essence of such social justice lies with the way society allocates its resources to its members, so as to allocate the resources equitably among

the various groups irrespective of superior subordinate order, the quality norm is related to social justice.

Burman (1981) suggested that tribal development would lead to redistribution of income, equalization of distribution of development benefits.

Santhanum (1993) reported that to effectively participate, persons group have to identify themselves with the movement. This would be possible only when people are involved in need identification, fixing priorities among the needs, and associated in the planning decision making, implementing and evaluation process and given an opportunity to create, maintain and manage local organisations. In general it can be said that community participation implies sustainable development with and by the people and not just for the people.

Turton and Reddy (1998) reported that to ensure even a moderate degree of equity, there requires high level of social organisations.

Singh and Shimray (2001) reported that in the case of Adivasi / Indigenous people, the principle of participatory local self governance should be vigorously pursued, indicating the full implementation o f the Panchayat (Extension to scheduled Areas) Act-1996.

Ethnocide

The term 'ethnocide' is very important as far as the tribal problems are concerned. Stavenhagen (1992) defined 'ethnocide as the process through which a culturally distinct people lose their identity due to policies designed to erode its land and resource base, use of its language, its own social and political situations as well as its traditions, art forms, religious practices and cultural values'. When ethnocide is internalized by the tribal people, sentiments of inferiority and self hate are created and a feeling of despair and insecurity gets widespread.

7. Socio-political empowerment

Empowerment means "given power or authority to act" (Hornby, 1974).

Griffen (1987) defined empowerment as a process of awareness and capacity building leading to greater participation to greater decision making power and control and to transformative action.

Srinath (1994) defined empowerment as the acquisition of power, status and self-confidence, the opportunity to develop a sense of autonomy and ability to manage one's own life.

Social sustainable development is really the issue of empowerment. Empowerment is really to reach the poor and the marginalized of society. It is to reach to all of the poor and give them opportunity to take charge of their own future, their own destiny (Seragaldin, 1994).

UNDP (1993) reported that social empowerment means being able to join fully in all forms of community life without regard to religion, colour, sex and race.

Political empowerment means freedom to choose and governance at every level, from the presidential place to village level.

Haq (1995) observed that empowerment means that people are in a position to exercise their own free will to fully in making and implementing decisions.

Oakley (1991) observed that empowering rural people through development of skills and abilities enables them to manage or negotiate with existing delivery system. Participation is an exercise of empowering rural people.

Jain (1993) reported that two provisions of the 73rd Amendment, in particular, will have far-reaching implications on sustainable development. Firstly, the provisions of having reservations for the SCs

and STs and women in Panchayat Raj institutions will go along way to provide (a) channels of social mobility, (b) greater share in decision making process and (c) participation of these groups in wider planning process. Since these groups constitute a large bulk of the rural poor, their active participation will have a positive bearing on sustaining the development process and reduction of poverty besides that on socio-economic areas.

The struggle for entitlement for tribal's labour is the real struggle for social justice (Sharma, 1993).

8. Protection of cultural heritage

Culture is a human phenomenon which implies the recording and transmission from one generation to the next, of learned ways of behaving believing valuing and desiring (Cooper, 1970).

Fairchild (1977) indicated that essential part of any culture is to be found in the patterns embodied in the social traditions of the group *i.e.*, in the knowledge, belief, values, standards and sentiments prevalent in the group. It is the appreciation of values with reference to life conditions.

Nambiar (1990) opined that rituals have taken shape from the felt needs of a collectivity with common goals and common struggle for existence.

Pickering (1976) has made the observations that rituals have played important role in maintaining social relationship.

Shantha (1993) reported that socio cultural contexts of tribes needs to be given proper attention and adequate importance. Cultural contexts of tribes often affects the choice of intervention.

Kannan (2000) has observed that folklore is the unrecorded history of society.

9. Institution building

According to Barnabas (1993) institution building is very essential for sustainable development. The focus of attention will be on developing multiple institutional options for improving the delivery system using the vast potential of the voluntary sector. Institution building would mean encouragement and support for the changed patterns of human behaviour. It would also refer to people's participation and their ability to respond to change and changing environment. Institution building is also concerned with the implementing agency. A sensitive and responsive bureaucracy would allow more scope for sustainable development.

Jain (1993) indicated the need for mutually re-enforcing packages of technology, services and government policies for maintaining the momentum of progress has been right by advocated. It has also been stressed that without land reform, a long term interest in strengthening the production and infrastructure of farm will be lacking. This will require a sustainable and strong network of local institutions to effectively help in implementing these development schemes. He also reported that strategies for institutions building process at the grass roots level will have to be given prime place in achieving sustainable development.

10. Infrastructure development

Trivedi (1988) reported that expenditure incurred for infrastructure development are supposed to affect the overall development of the regions and less to the individual social group. However, the brighter side of this infrastructure development concern cannot be ignored, as it brightens the overall economic development environment and helps the tribals to feels the pulse of socio-economic changes.

He has also reported that infrastructure development head has received the greatest attention by claiming one third of the total development resources.

11. Right to information

Access to information is an essential requisite of an open society. The right to information is easy and seedy access to right information.

Information is a resource which empowers people to act more meaningfully as electors as well as elected representative of the people. If people are well informed they will be more vigilant and therefore democracy is bound to become more vibrant.

Jain (1982) reported that the protection of the right of individual by giving them right to access information should be within easy reach and an affordable cost.

Vinod (2001) reported that freedom of information should be a measure of maintaining a balance between secrecy and disclosure, between official control of information and public need for it.

12. Human right security

National Human Rights Commission (2001) defines "human rights" to man the rights relating to life, liberty, equality and dignity of the individual guaranteed by the Constitution or embodied in the International Conveniens.

The commission believes that the promotion and protection of the human rights of the weakest section of society are clearly related to their full and proper empowerment.

National Human Rights Commission also reported that economic upliftment and empowerment of Dalits is the most effective tool to combat casteism. More avenues must be opened for the economic betterment of the disadvantaged.

Justice Verma (2001), Chairperson of NHRC said that the issue of human right is linked to development and could not viewed in isolation.

He said a public welfare-oriented and humane governance was necessary for proper implementation of human rights.

According to Annan (2001), U.N. Secretary General, why is human right education is so important ? Because, as it says in the Constitution of UNESCO *since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constr*ucted.

Starcevic (2001), Director, UN Information Centre, New Delhi stated that Human rights protection depends on proper information. People need to know what their rights are, and need to be able to report when they are infringed. They need to know what commitments their governments have made at international flora. Therefore, the human rights education is the first step towards a better world where human right violations are not the norm.

According to Justice Ramaswamy (2001) awareness of fundamental freedoms and human rights were essential and *human rights should be on the top of the agenda of plans and programmes.* He also reported that the human rights in urban and rural areas should be closely monitored.

2.9.1.3 Ecological Sustainability

1. Resource conservation

Burman (1981) stated that tribal development lead to reduction of social stratification and resource mobilization without affecting the quality of life and physical environment.

Jahagirdar (1993) observed that tribal development can be achieved through judicious use of natural resources and in congruence with local needs and values.

Inamdar (1993) reported that The World Conservation Strategy (WCS) launched in 1980 has further defined the three principal objectives of resource conservation as: maintenance of essential ecological process and life support systems, preservation of genetic diversity, and sustained utilization of species and eco-system.

In a study conducted in Tamil Nadu among Irulas reported that high dependence on bio-diversity for survival has made them acutely sensitive to their local environment, making conservation a way of life (Manju, 2001).

2. Ecosystem preservation

Jahagirdar (1993) reported that environmental problems of tribal region can be identified under two broad categories.

1. Those arising out of conditions of poverty and under development.
2. Those arising as negative effects of the very process of development. Hence environmental soundness is very essential for the sustainable development of tribals.

He also reported that tribals are entirely dependent on the nature since generations and they have a stake in its conservation. Hence, their involvement in development will take care of the conservation aspect.

According to Cohen *et al.* (1988) environmental soundness means that the quality of natural resources maintained and the vitality of the entire agro-ecosystem from humans crops and animals to soil organisms is enhanced.

Hiremath (1993) reported that the best way to arrest environmental degradation and promote sustainable use of environment is to ensure the central participation of the people, especially the tribal and rural poor, in the control and management of natural resources.

Poverty is often indicated as a reason of environmental degradation. The poor people are both agents and victims of environmental degradation. However, the main causes of rural poverty leading to environmental degradation are abundant use of traditional practices, collapse of local institutions, deforestation and soil erosion in small farmer's fields (Jain, 1993).

Kamta (1993) reported that adoption of an integrated approach to environmental impact assessment of development project would be of much help in promoting sustainable development. This could be possible through proper economic evaluation provided the environmental effects are calculated objectively in accordance with preferences of the affected public.

3. Indigenous knowledge system

Vivek and Santhosh (2001) reported that indigenous knowledge (IK) refers to the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area. The development of IK systems, covering all aspects of life, including management of natural resources has been a matter of survival to the people who generated these systems. It is based on experience, often tested over centuries of use, adapted to local culture, environment and dynamics.

According to them, IK is valuable resource for development. Under certain circumstances, it can be equal to or even superior to the know how introduced by modern research. Development efforts should, therefore, consider IK and use it to its best advantage. They also reported that IK provides basis for problem solving strategies for local communities.

According to Ramakrishnan (1993) sustainable development of tribals can be achieved only through the traditional technology as the starting point.

2.10 FACTORS INFLUENCING SUSTAINABLE TRIBAL DEVELOPMENT INDEX

1. Socio–economic status

Chapin (1928) defines socio-economic status as the position an individual or a family occupies with reference to the prevailing average

standards of cultural possessions, effective income, material possessions and participation in the group activities of the community.

Belcher (1951) defined socio- economic status as the material possession items tended to be more staple indicators of socio-economic status than those dealing with social participation or cultural possession.

For the present study socio-economic status refers to the respondent's occupation, education, social participation, land, house, farm power and family.

Jalihal (1960) reported that higher socio economic status was positively related to adoption of new ideas.

Kumar (1970) reported that in general tribal achievement in literacy and gainful occupation are poor and long behind the rest of the population.

Sushamma (1979) reported that socio-economic status of tribals had a positive and significant relationship with adoption of modern living practices.

2. Land alienation

Dubey and Muridia (1977) reported a positively significant relationship of land alienation with economic needs of the tribal people.

According to Mathur (1977) land is sometimes linked with the perpetuation of groups of tribal people with their autonomy, solidarity and cohesion. Land is useful to them in several ways such as a source of food gathering and hunting and also as a place to live in and work. The problem of land alienation among the tribal people is not only related to the economic but also to the socio-political and moral systems of the country. Though majority of the tribes were agriculturists, the alienation of land in most cases reduced them to the status of landless labourers.

Padmanabhaiah (1977) reported that about 16 per cent of the tribes in the Nasik district of Maharashtra transferred their land for meeting the demands of money for agricultural purposes.

3. Indebtedness

The study by Mathur (1975) also revealed that the most important cause of indebtedness among the tribes of Kerala are their primitive agricultural technology, illiteracy, low wages, absence of marketing infrastructure and their social and religious problems. The study revealed that the agricultural loans were mostly used for consumption of by majority of tribes. He has also reported that these tribes who have adopted improved seeds and modern techniques of cultivation are heavily indebted than those who have not responded to improved techniques.

According to Ganguli and Gupta (1976) indebtedness includes hereditary debt, short and long term loans borrowed by the family for various purposes like socio cultural activities, improvement of land, purchase of land and livestock, construction of houses, purchase of other movable or immovable assets, crop loans of consumption expenditure.

Indebtedness is a very serious problem faced by the tribes of Kerala. Tribal indebtedness in both a cause and effect of poverty and is also related to bonded labour and alternation of tribal land (Mathur, 1977).

Puri (1978) viewed a positive significant relationship of indebtedness of tribals with development.

Sadamate (1978) reported that indebtedness was positively and non significantly related to the technological gap in the tribal farming system.

Prakash (1980) reported a positive and significant relationship between indebtedness and adoption of improved agricultural practices in the medium developed tribal areas of Wayanad, while this relationship was not significant in less developed area.

4. Level of aspiration

English and English (1958) defined level of aspiration as the "standard by which a person judges his own performances as a success or a failure or as being up to what he expects of himself.

Cantril and Free (1962) defined level of aspiration of an individual as his own over all assessment of his concern for wishes and hoes for the future or for the fears and worries about the future in his own reality world.

Muthayya (1971) reported that one's personal and socio-economic attributes to a great extent contributed to one's level of aspiration which increased the adoption of new idea.

Sushama (1979) reported that level of aspiration (future) of tribal people had a positive and significant relationship with knowledge about modern living practices.

5. Economic motivation

Sadamate (1978) reported a positively significant relationship with economic motivation and attitude of tribals towards development.

Meera (1995) reported that a positively significant relationship exists between economic motivation and adoption behaviour of farmers.

6. Guidance and supervision

Waghmare and Pandit (1982) reported that a positively significant relationship exists between guidance and supervision and agricultural development of tribals.

Pillai and Prasad (1983) also reported a positively significant relationship between guidance and supervision and agricultural development of Muduva tribe.

7. Orientation to incentives

Kunjaman (1985) in a research study on Important New Settlers in Wayanad reveals that persisting dependency attitude of tribals is evident from the fact that 72 per cent of them still expect financial support and subsidized assistance from the government for improving their living conditions.

8. External interference

Viju (1985) viewed a positively significant relationship of external interference with agricultural development of tribals.

Subramaniam (1986) reported a positively significant relationship of external interference with the development of tribals.

Trivedi (1988) reported that the social environment with a larger non-tribal social setup has not allowed the tribals to move up on the ladder of occupational transformation from agricultural workers to the dignified group of cultivators.

Report of Research Project, Ministry of Environment and Forest (1992) reported that major (54.39 per cent) of the tribal respondents felt that the influx of settlers had affected them favourably. While 4.67 per cent felt that main objective of settlers was to snatch the tribal land. Similarly 26.32 per cent strongly felt and 45.61 per cent partly agreed that wage labour in estate available to the tribals declined as settlers also joined the labour force competing for the limited job opportunities.

Nearly 90 per cent felt that alienation of tribal lands increased with influx of settlers.

The report also revealed that the settlers not only grabbed the tribal lands, but had also encroached to forestlands in which tribals exercised considerable user rights.

9. Value orientation

Parson and Shills (1965) defined value orientation as those aspects of the actor's orientation which commits him to the observance of certain norms, standards, criteria for selection whenever he is in a contingent situation which allow him to make a choice.

Barakataky and Gohain (1970) reported that due to the presence of certain institutional behaviour like religious belief, customs and practices, the pace of expected development was not upto the mark among the tribals.

Dar (1970) reported a positive and significant relationship of value orientation with shifting cultivation of tribals.

Goswami and Saika (1970) reported that value orientation of tribals are having a positive significant relationship with modern development.

Prakash (1980) also reported a positively significant relationship of value orientation with agricultural development of tribals.

Kokate *et al.* (1988) found that traditional believes held by tribals were the bottleneck in the adoption of improved practices in agriculture and animal husbandry.

Chackrabarthy *et al.* (1989) stated that the absence of attitudinal change, attachment of tribals towards traditional heritage, culture and scenic environment in which they live were important aspects of social life that failed to influence the tribal farmers in generating increased level of employment.

Methodology

3. METHODOLOGY

This chapter deals with the materials used and methods employed in this study, and the same are presented in the following sections.

3.1. Locale of the study

3.2. Selection of the sample

3.3. Measurement of variables

3.4. Statistical tools used

3.5. Conceptual model of the study

3.1 LOCALE OF THE STUDY

According to the 2001 census, out of the total population of 31841374 in Kerala 364189 (1.14 %) belong to the Scheduled Tribes. Of the 50 tribal communities of the state, 35 are scheduled tribes and the rest are denotified tribal communities. Eventhough tribal population is scattered throughout Kerala, they are mainly concentrated in three districts namely Wayanad, Idukki and Palakkad. More than 60 per cent of the tribal population in the state is concentrated in these three districts. Wayanad is the district having highest tribal population (37.36 per cent) followed by Idukki (14.00 %) and Palakkad (10.89 %). Hence these three districts are purposively selected for the study. These are the districts where major share of funds spent for tribal development. These are the reasons why these three districts are selected for the study (Table 9 and Fig. 1).

3.1.1 Description of Tribes Under Study

3.1.1.1 Tribes in Wayanad

The most important profile characteristics of tribes in Wayanad is presented in Table 10.

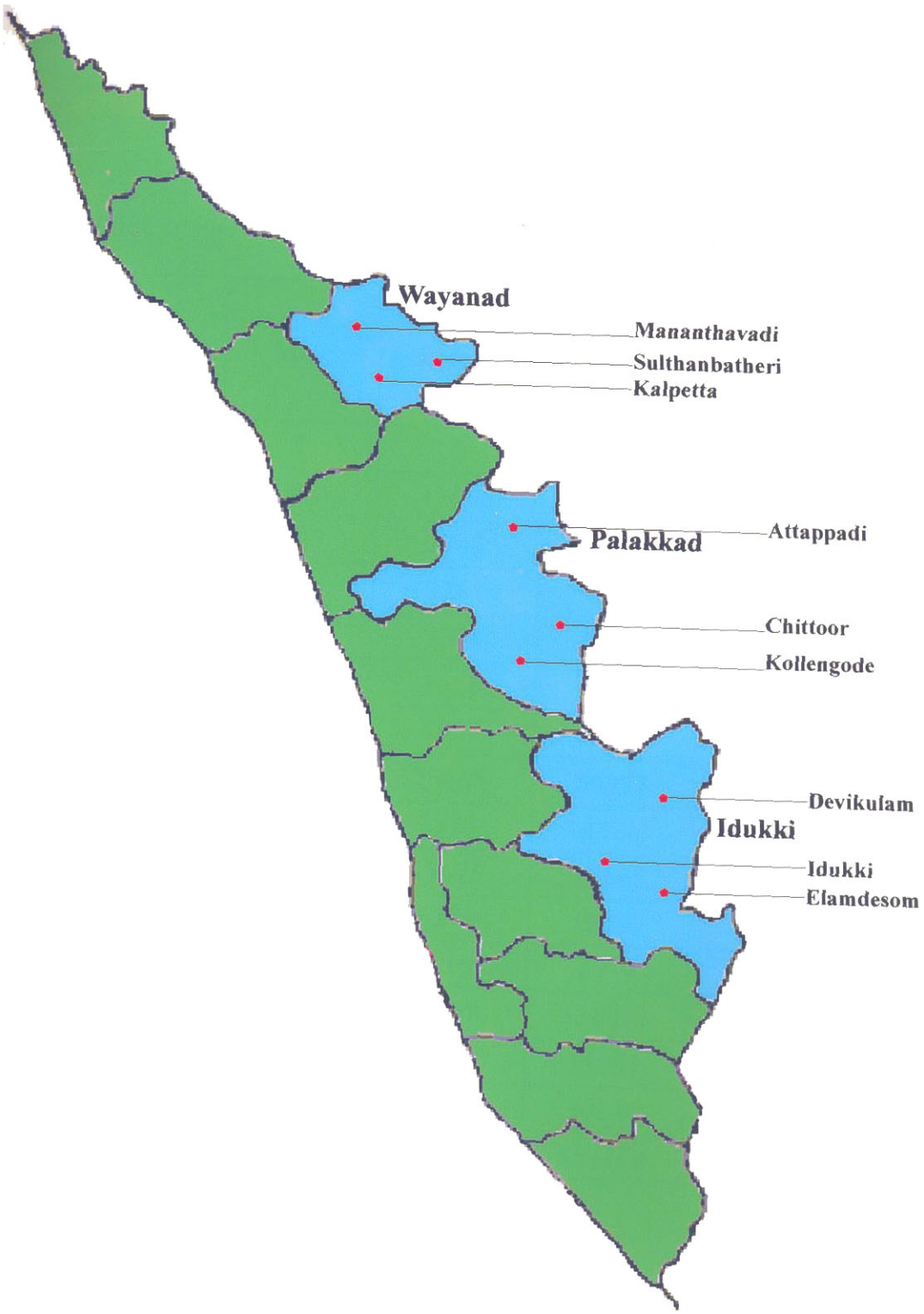


Fig. 1. Map showing locale of the study

Table 9. District wise population of Scheduled Tribes in Kerala – 2001Census

Name of District	Male	Female	Total	District ST population as % State's ST (population)
1	**2**	**3**	**4**	**5**
1. Thiruvananthapuram	9890	11003	20893	5.74
2. Kollam	2447	2743	5190	1.43
3. Pathanamthitta	3184	3365	6549	1.80
4. Kottayam	8972	9368	18340	5.04
5. Alappuzha	1565	1566	3131	0.86
6. Ernakulam	5079	4967	10046	2.76
7. Idukki	**25510**	**25463**	**50973**	**14.00**
8. Thrissur	2293	2533	4826	1.33
9. Palakkad	**19990**	**19675**	**39665**	**10.89**
10. Malappuram	5996	6271	12267	3.37
11. Kozhikode	2924	3016	5940	1.63
12. Wynad	**67394**	**68668**	**136062**	**37.36**
13. Kannur	9793	10176	19969	5.48
14. Kasargod	15132	15206	30338	8.31
Total	180169	184020	364189	

Table 10 Profile characteristics of tribes in Wayanad

Total number of tribal colonies	1938
Number of household	23287
Average household size	4.93
Literacy (effective rate)	50.63
Number of BPL families	14063
Poverty rate	60.38 %
Most back ward tribe	Paniyar
Primitive tribe	Kattunaickan
Farming community	Kurichiar, Kurumar
Agricultural labourers	Paniyan, Adiyan, Kattunaickan

(Source: Rural Information Bureau, Rural Development Department, October 1992)

Important Tribes

1. Paniyans

Paniyans are set of nomads in the past who roamed about in the Nilambur forests. Their traditional occupation is agriculture. They speak Malayalam with certain dialectical variations. In pronunciation and terminology their language is a kin to Tamil or Canarese. They are a set of peace loving, less adventurous people. They are obsequious to their landlords and are without any manifest grudge or demur. These groups of people are grossly illiterate and intellectually humble but highly orthodox and superstitious. Paniyans recognize leaders in each of their group and hold them in high esteem.

The traditional habitation of Paniyans is a small thatched hut. They are accustomed to sleep beside the hearth. Most of the Paniyans men and women wear a loin cloth. Hunting has a fascination for them.

Plate 1. Erumaadam - Begur tribal hamlet (Thirunelli)

Plate 2. House of Kattunaickan,
Ponkuzhi tribal hamlet (Noolpuzha)

Plate 3. Minor forest produces collection centre of
Scheduled Tribes Co-operative Society - Noolpuzha

Among Paniyans, girls are the wealth of their parents, for they fetch money at the time of their marriage. Paniyans are not polygamous or polyandrous, levirate and sororate systems are also not in vogue among them. They believe that death is the radical cure to life's sorrowing problems.

2. Adiyan

Adiyans generally tall and sturdy in stature and dark in complexion are found in Thirunelly (Wynad district). Most of them are agricultural labourers and have permanent dwellings. They follow Hindu religion. Their language is a mixture of Canarese and Malayalam in the corrupt form. But they are able to speak Malayalam to others. The system of 'Marumakkathayam' is followed by this tribe. Polygamy and polyandry are not generally present. But the system of elopement, subsequent marriages as well as remarriage of widows and widowers and reunion of divorces are very common among them.

3. Kurumans

The Kurumans found in Thirunelli village and the suburban forests in North Wayanad are divided into two classes. Thenkuruman and Vattakuruman. The Thenkuruman as the name indicates were in former times engaged in the collection of honey, was and such other forest produces. Vettakurumans are small active people who are experts at forest work.

Their language is an admixture of Canarese and Tamil used in an unintelligible form. But they are able to speak and understand Malayalam. Vettakurumans are not good agricultural labourers but they are good in handicrafts such as making baskets, mats etc. These tribes usually live in clusters generally in a circular form. They are generally poor, ill fed and inadequately dressed. Rice and tapioca are staple food.

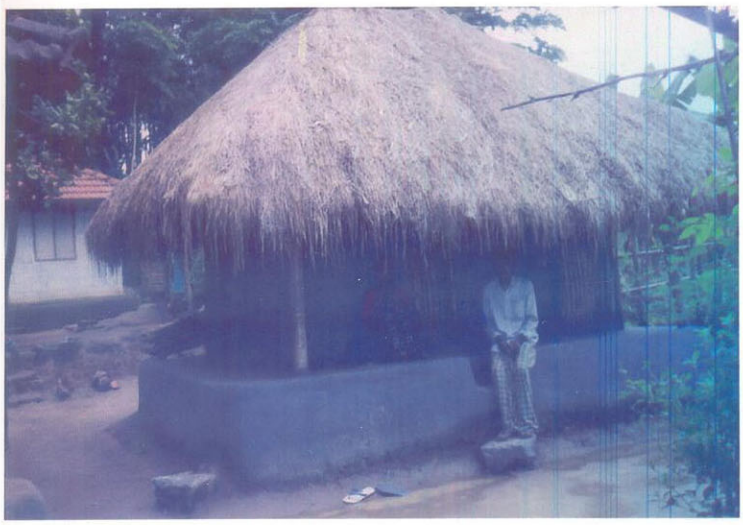


Plate 4. Cholanaickan (primitive tribe) in Thirunelli

Plate 5. Paniya tribe in Thirunelli

Plate 6. Kuruma tribes in farming
(Begur tribal hamlet in Thirunelli)

4. Kurichians

Kurichians are one of the oldest inhabitants of Wayanad. They are aristocrats among the hillmen of Kerala occupying the highest social status. They observe touch pollution against all castes and communities except Brahmins. They are skilled bowmen. They are also practicing shifting cultivation in the extensive tracts of virgin land. Today they have become settled agriculturists. Kurichian women have a considerable share in the tribal life. The women are prohibited from attending the funeral and the widows may not wear coloured garments and jewelry.

5. Kattunaickans

It can be presumed that they are migrants from Mysore forest as their language is akin Canarese and from the affinity of dress with tribes of Mysore. There are three sets among them viz., Malanaickan, Kattunaickan and Panninaicakn. Their religion has the similarity with Hinduism. The traditional occupation of this tribe is hunting. Just like all other tribes, these people also consider birth as a happy event, marriage solemn and death is viewed with grief and horror.

3.1.1.2 Tribes in Idukki

The most important profile characteristics of tribes in Idukki is presented in Table 11.

Table 11 Profile characteristics of tribes in Idukki

Total number of households	11516
Average household size	4.36
Literacy (effective rate)	62.78
Number of BPL families	6422
Poverty rate (%)	55.76
Most backward tribe	Hill Pulaya
Primitive tribe	Uraly
Farming community	Mala Aryan
Agricultural labourers	Palliyans

(Source: Rural Information Bureau, Rural Development Department, October 1992)

Plate 7. *Paniya* tribe in Ambedkar tribal hamlet, Thirunelli

Plate 8. *Oorali* tribal family, Poomala Methotty hamlet, Velliyamattom

Plate 9. Kannickal tribal hamlet - *Nadappatha,* constructed under People's Plan

Important Tribes

1. Mala Arayans

They are generally dark but possesses good features and are fairly tall. They are a civilized group. Being traditional agriculturists, these people enjoy vast areas of forest land on which they raise paddy, tapioca, pepper and cardamom. They are generally found in the woodlands of Thodupuzha and Meenachil taluks. They realise the importance of education and they do not hesitate to send their children even to distant schools. Mother tongue is Malayalam and most of them are literate. Mala Arayans are Hindus and worship Gods and Goddesses. They dress neatly. Their staple food consists of rice and tapioca.

3.Mannan

The origin of the Mannan was at Mannankotta in Poonjar. After some years they spread to Udumbanchola taluk, Idukki, Periyar, Malappara, Manchuppara and Kumali. An average Mannan enjoys good health and possess a good physique. Most of them are grossly indifferent in the matter of dress and cleanliness.

The language of Mannan is peculiar. It is a curious mixture of Tamil, Malayalam and Tribal slangs. The religion of Mannan is similar to Hinduism and their supreme God is Sasta. The residential pattern of these Mannans is characteristic of most of the tribes in the state.

4. Palliyans

A small group of Palliyan is found at Kumili. While this group with another at Vandanmettu retains their traditional way of life, another group at 'Christianity'. Their language is colloquial Tamil. The very way of their dressing is fairly suggestive of their reported origin at Madura. They had in the past migrated to Travancore.

Plate 10. Government land issued to tribes at Marayoor (Kanthalloor)

Plate 11. Dendukombu *Hill Pulaya* tribal colony, Kanthalloor

Plate 12. *Mala Arayan* tribes, Poomala Methotty hamlet, Velliyamattom

Men and women are generally healthy. They have only one leader by name 'Kanikkaran'. The different occupations of Palliyans are labour, collection of firewood from forest and agriculture. Religion is Hinduism.

Polygamy and polyandry are prohibited among Palliyans. Levirate and sororate systems are not in practice. Divorce is permissible under the tribal law.

5. Hill Pulaya

Hill Pulaya, otherwise known as Kurumba Pulaya are a set of substandard people. They are living scattered and are seen in Devikulam taluk. Almost half starved and economically low satatus, they are backward in many respect. It is believed that they had migrated many years back from Madura to Devikulam.

The mother tongue of Hill Pulaya is a crude form of Tamil. They are Hindus in belief and practice. The male usually wear a dhothi and an upper cloth, women put on a chela.

Ragi and Cholam form their staple food. The system of polygamy and polyandry are not commonly observed, sororate is popular. They observe endogamy in marriage. They have their marriage relationship more substantial unlike the Adiyans, Paniyans and Kurumans.

3.1.1.3 Tribes in Palakkad

The most important profile characteristics of tribes in Palakkad is presented in Table 12.

Important Tribes

2. Irular/Irulan

Irulas of Attapady are Tamil origin. They use only flowing water from rivers and channels because of the age old belief is that the stagnant water is poisonous. They are worshippers of Lord Siva. The language of

Plate 13. *Oorukkutom* at Agali panchayat

Plate 14. A house constructed by District panchayt, Palakkad for *Irula* tribal family - Alankandy hamlet, Agali

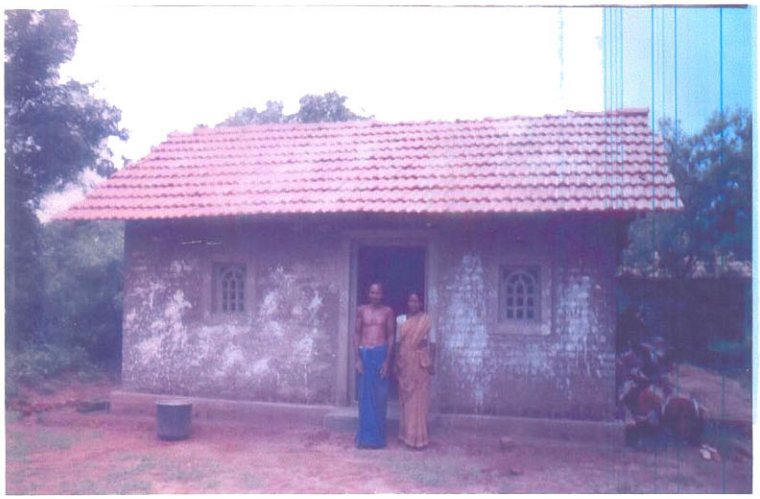


Plate 15. *Eravalar* tribal family, Sarkarpathy colony, Perumatty panchayat

Table 12 Profile characteristics of tribes in Palakkad

Total number of households	8610
Average household size	4.11
Literacy (effective rate)	34.87%
Number of BPL families	4571
Poverty rate	53.08%
Farming community	Irular
Agricultural labourers	Malayans

(Source: Rural Information Bureau, Rural Development Department, October 1992)

Plate 16. Water supply scheme assisted by World Bank in Dendukombu tribal hamlet, Agali

Plate 17. Farming of Irula tribes in Agali

these Irulas is colloquial Tamil. Their language has no script of its own. Each settlement consists of a set of households. Their huts are erected close to one another. The Irulas are favourable to sending their children to school. They have apparently an utter disregard for cleanliness.

2. Malayan

Malayans are generally seen in the Valayar forests of Palakkad district. It is believed that these tribes have migrated to this place from Coimbatore forests. Malayans are divided into two subdivisions : (i) Konga Malayans and (ii) Nattu Malayans. There is no significant difference in their religious and social observances. The customs and manners are all alike except their form of marriage. This is unique among the Konga Malayans. They observe the Makkathayam rule. Inter-marriage and interdining are allowed among Paniyans and Konga Malayans. Monogamy is the general rule among them, though polygamy is also allowed. Either party is at liberty to divorce the other, but if the wife take the initiative to get divorced then the husband will demand the pariyam amount. Levirite and sororate are also common among them.

3.2 SELECTION OF THE SAMPLE

From each selected districts, three blocks having maximum tribal population are identified. Then one panchayat each having maximum tribal population was identified from each block. The tribal hamlets in each panchayat were identified and respondents were selected using proportional random sampling procedure as detailed in Table 13, thus forming a sample of 200 respondents for the study.

Table 13 Details of sample size of selected panchayats

Name of district	Block	Panchayat	Population	Name of hamlet	Number of respondent selected
Wayanad	Mananthavadi	Thirunelli	9153	Ambedkar colony, Kattikulam Panavalli colony Begur colony Olanchery colony	36
	Sulthanbatheri	Noolpuzha	8932	Ponkuzhy colony	35
	Kalpetta	Kaniyanbetta	5191	Ambalachal colony	20
				Subtotal	**91**
Idukki	Devikulam	Kanthalloor	4634	Dendukombu colony	18
	Elamdesom	Velliyamattom	5290	Poomala colony Methotty colony	21
	Idukki	Arakulam	3768	Kannickal colony	16
				Subtotal	**55**
Palakkad	Attappadi	Agali	9507	Kavundikkal colony Donikundu colony Alankandi colony Bhoothivazhi colony	38
	Chittoor	Peramatty	2399	Sarkarpathy colony	9
	Kollenjode	Muthalamada	1750	Sunkom colony	7
				Subtotal	**54**
				Total	**200**

3.3 MEASUREMENT OF VARIABLES

3.3.1 Sustainable Tribal Development Index

Development of sustainable tribal development index to measure the sustainability of tribal development in Kerala is one of the first and specific objectives of the study. Before formulating the Sustainable Tribal Development Index (STDI), it is necessary to arrive at the definition of sustainable tribal development.

3.3.1.1 Operationalisation of Definition – Sustainable Tribal Development

For the purpose of arriving definition of sustainable tribal development, ten number of experts, scientist, officials in the field of tribal development were requested to express their idea about sustainable tribal development in writing. From the conceived ideas, review of literature and discussion with experts, definition of sustainable tribal development is arrived at and was sent for judges opinion to 20 experts in the field of tribal development with a request to judge whether the definition on sustainable development is adequate or not with provision for necessary suggestion (Appendix I).

Based on the responses received, sustainable tribal development was defined as "the socio-economic and cultural progress that empowers the tribal society in meeting their own basic needs, to provide support services including education, health care, social justice and human rights and enabling them to control their land resources, social organisation and preserve their culture to attain lasting improvements in quality of their life".

3.3.1.2 Formulation of Sustainable Tribal Development Index (STDI)

The dependent variable selected for the study was Sustainable Tribal Development Index (STDI). Sustainable tribal development is the yardstick to measure the sustainability of tribal development. The index is

composed of various dimensions and the cumulative expression of the development performance of the tribes in relation to the dimensions of sustainable tribal development is the STDI value of the individual tribe.

There is no universally acceptable measure that could be used to evaluate the sustainable tribal development. But the researchers constructed different types of indices for measurement based on specific objectives.

Swaminathan (1991) proposed a sustainable living security index claimed to be the legitimate indicator of sustainable development because of its ultimate linkage with welfare goals like poverty alleviation, meeting basic needs, human development and quality of life.

Sustainable Living Security Index is a composite of

a) Ecological Security Index indicated by percentage of forest cover and percentage of net sown area

b) Economic Efficiency Index indicated by land productivity and percentage area under cereals

c) Social equality index indicated by percentage of people above the poverty line and female literacy

Jaleel (1992) constructed agricultural development index composed of ten agricultural development indicators to assess the extent of agricultural development among the 'Kani' tribal farmers in Thiruvananthapuram district.

In this study, sustainability of tribal development was measured using the sustainable tribal development index developed for the purpose and it is composed of different dimensions of sustainable tribal development. Hence the delineation of dimensions is very important in the formation of sustainable tribal development index.

3.3.1.2.1 Delineation of Dimensions of Sustainable Tribal Development Index

The various dimensions of sustainable tribal development were identified using Nominal Group Technique as adopted by Nehru (1993). The identified dimensions were prioritized using Policy Delphi technique of Turoff (1975). The details are furnished below.

Collection of Dimensions through Nominal Group Technique (NGT)

Nominal Group Technique was applied to collect the exhaustive list of dimensions of sustainable tribal development. The technique was applied in a non-sample area.

Here, the investigator explained the objectives of research work and purpose for which the group session was convened. Each member was requested to state various dimensions of sustainable tribal development. The stated items were edited and presented in the second session and discussed in detail to avoid ambiguity.

In addition to tribal respondents in non-sample area, leaders of tribal organisations, researchers, experts and development officials in the field of tribal development were also included as respondents to identify the dimensions of sustainable tribal development.

Prioritization of the dimensions by Delphi methodology

In order to prioritize the identified dimensions of sustainable tribal development, Delphi analysis was done as followed by Prakash (1980).

The Delphi methodology

Brown (1968) pointed out that the Delphi is a name that has been applied to a technique used for elicitation of opinion with the object of obtaining a group response of a panel of experts. Delphi replaces direct confrontation and debate by a carefully planned, orderly programme of sequential individual interrogations usually conducted by questionnaires.

The series of questionnaires are interspersed with feedback derived from the respondents. The technique puts the emphasis on informed judgment. It attempts to improve the panel or committee experts to each others criticism in ways that avoid face to face confrontation and provide anonymity of opinion and of arguments advanced in defence of these opinions. In the case of tribal respondents the method used was personal interview.

The Delphi process today mainly exists in two forms. One is referred as Delphi exercise and another form is Policy Delphi, which was first introduced and reported by Turoff (1975).

A Policy Delphi deals largely with statements, arguments, comments and discussions. To establish some means of evaluating the ideas expressed by the respondents, rating scale must be established for such items. The scale must be carefully defined so that there is some reasonable degree of assurance between most important and least important.

Application of Delphi method

The Policy Delphi procedure was followed with slight modification. It had three steps consisting of two steps for the identification of dimensions and the third step for giving ranks to the identified dimensions of sustainable tribal development.

STEP 1 : By applying the Nominal Group Technique (NGT), 30 dimensions of sustainable tribal development were identified under three major sub-dimensions of economic, social and ecological sustainability. These were carefully examined and analysed in the light of theoretical assumptions as well as with the assistance of experts. These dimensions with an explanatory note were sent for relevancy rating to 120 judges. The judges comprised of scientists, experts, development officials, leaders etc in the field of tribal development, State Agricultural University,

Kerala Institute for Research, Training and Development Studies of Scheduled Castes and Scheduled Tribes (KIRTADS), State Planning Board, Tribal Development Department and Local Self Government (LSG) Institutions. The respondents were asked to rate the dimensions on a five point continuum and to add additional dimensions if any, along with their rating of these dimensions.

Scoring procedure adopted was as follows :

Rating	Score
Most relevant	5
More relevant	4
Relevant	3
Less relevant	2
Least relevant	1

Eighty experts had responded. The responses were then pooled and again subjected to relevancy rating in step 2.

STEP 2 : All the dimensions of sustainable tribal development were again rearranged with inclusion of additional dimensions and again given to the same experts for relevancy rating. There were 35 dimensions (Appendix II) and the respondents were asked to rate the dimensions on a five point continuum from most relevant to least relevant along with weightages to three sub-dimensions – economic, social and ecological sustainability. Seventy two experts had responded. Responses were then tabulated. Total relevancy scores for each dimension of sustainable tribal development was obtained by summing up the weightages over all the respondents.

STEP 3 : The relevancy index for each dimension was worked out using the formula given below.

$$\text{Relevancy Index (RI)} = \frac{\text{Scores obtained}}{\text{Maximum possible score}} \times 100$$

The dimensions with relevancy index more than 75 were selected. Out of 35, 13 dimensions were thus rejected leaving 22 dimensions under three major sub-dimensions of economic, social and ecological sustainability to be included in the final stage. They are given below (Appendix IV).

Economic sustainability

Control over land resources

Employment and income generation

Control over minor forest produces

Agricultural productivity optimization

Social sustainability

Food security

Housing security

Human resource enrichment

Health and nutritional security

Ethnodevelopment

Participation

Social and political empowerment

Strengthening of hamlet system

Protection of cultural heritage

Human right security

Institution building

Infrastructure development

Right to information

Promotion of moral value

Development facilitatory linkage

Ecological sustainability

Resource conservation

Environmental soundness

Indigenous knowledge system

Scaling of dimensions

Scale values were worked out for the 22 dimensions of sustainable tribal development using Composite Standard Method under Normalized Rank Order Technique as suggested by Guilford (1956) in order to arrive at an interval level of measurement. This method was used to compute scale values for the indicators of Agricultural Progressiveness Scale. For the purpose of computing scale values of these dimensions, they were sent to 120 experts within the country with request to ranks ranging from 1 – 22 without duplication for each of these dimensions in relation to others on the degree of their contribution to sustainable tribal development.

Seventy two judges sent back their responses. Rankings from these judges were tabulated and frequency distribution was worked out for each dimension over all the ranks. The frequency of each dimension under each rank was multiplied by the corresponding rank value and then summated over all the ranks to get a total score ($\Sigma f_{ji}R_i$) for each dimension. Scale values 'Rc' were worked out as shown in Table 14. The operations in each line of this table have appropriate checks as shown in the last column.

Selection of items

After a thorough review of literature and discussions with experts in the field of tribal research and development at different Universities, KIRTADS, State Planning Board, Tribal Development Department etc., a comprehensive and exhaustive list of items related to the dimensions under study was prepared. This universe of content was then subjected to careful editing. Many items were eliminated and some others were modified and redefined. The remaining 130 number of items were grouped under the 22 dimensions were then subjected to item analysis.

Item analysis

The items with definitions of the dimensions and instructions were sent to 70 judges. The judges comprised of experts / scientists from

Table 14 Derivation of scale value for the dimensions of sustainable tribal development by Composite Standard Method

	Dimensions (1-22)																					
	Economic sustainability			Social sustainability																Ecological sustainability			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
$\Sigma f_{ij}R_i$	720	711	703	700	693	682	671	657	651	642	632	627	618	611	601	596	588	580	571	562	553	541	$N\Sigma R_i = 7722$
0.5N	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	$0.5Nn = 792$
$C_j>C_s$	684	675	667	664	657	646	635	621	615	606	596	591	582	575	565	560	552	544	535	526	517	505	$N\Sigma R_i - 0.5Nn = 6930$
$P_j>C_s$	0.431	0.426	0.421	0.419	0.414	0.407	0.400	0.392	0.388	0.382	0.376	0.373	0.367	0.363	0.356	0.353	0.348	0.343	0.337	0.332	0.326	0.318	$0.5n = 11$
$Z(j>C_s)$	-0.17	-0.18	-0.20	-0.20	-0.21	-0.23	-0.25	-0.27	-0.28	-0.30	-0.31	-0.32	-0.34	-0.35	-0.36	-0.37	-0.39	-0.40	-0.42	-0.43	-0.45	-0.47	6.90
R_j	0.31	0.28	0.27	0.26	0.25	0.23	0.22	0.19	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.06	0.05	0.03	0.02	0.00	3.33
$RC = 6.335 R_j + 0..86$	2.82	2.63	2.57	2.50	2.44	2.31	2.25	2.12	2.00	1.93	1.81	1.74	1.68	1.62	1.49	1.43	1.36	1.24	1.17	1.05	0.98	0.86	42.66

N = 72 N = Number of judges

n = 22 n = Number of dimensions

$\Sigma f_{ij}R_i$ = Σ(Rank value x number of choices given by judges for i^{th} dimension)

$C_j>C_s = \Sigma ji\, Ri - 0.5\, N$

$$P_j>C_s = \frac{C_j>C_s}{Nn}$$

Rj = Difference between z (j>Cs) of each dimension and lowest z value

Rc = Scale value = 6.335 Rj + 0.86

Universities, KIRTADS, Planning Board and Tribal Development Department. The judges were requested to assess the relevancy of each item in measuring the dimension corresponding to them on a three point continuum. Forty two judges responded. Scoring was done assigning values of '3' for most relevant '2' for relevant and '1' for least relevant. The scores for each item were summated over all the respondents and a relevancy index was worked out using the following formula.

$$\text{Relevancy Index (RI)} = \frac{\text{Scores obtained}}{\text{Maximum possible score}} \times 100$$

Those items which secured a relevancy index of 80 and above were finally selected, thus retaining 84 items for inclusion in the scale. Table 15 shows a clear picture of the dimensions, number of items included under each dimension, possible range of scores and scale value worked out for each dimension in the final scale.

3.3.1.2.2 Operational definition and measurement of dimensions of STDI

Economic sustainability

Economic sustainability of tribal development is the extent to which tribal development focus on growth of tribal life in a quantitative and economic terms which demands a sustainable per capita income and efficiency in use of resources and investment for their economic development.

All the selected dimensions are measured using the scale developed for the purpose.

1. Control over land resources – refers to the possession of sufficient land, the right and control of tribal people on their land and land resources for their secure living and the extent to which the land right is protected by the government.

This was measured using the scale developed for the purpose. Total number of items under this dimension is 3. The response categories *viz.*,

Table 15 Dimensions, number of items, possible range of scores and scale values of the sustainable tribal development

Sl. No.	Dimension	Number of items	Possible range of scores	Scale value
1	Control over land resources	3	2-8	2.82
2	Food security	4	4-12	2.63
3	Housing security	4	0-12	2.57
4	Employment and income generation	2	2-10	2.50
5	Control over minor forest produces	2	2-6	2.44
6	Human resource development	9	9-27	2.31
7	Agricultural productivity optimization	9	9-27	2.25
8	Health and nutritional security	12	12-36	2.12
9	Ethno development	4	0-12	2.00
10	Participation	3	1-9	1.93
11	Socio-political empowerment	2	2-6	1.81
12	Resource conservation	2	2-6	1.74
13	Strengthening tribal hamlet system	2	1-3	1.62
14	Indigenous knowledge system	3	0-3	1.68
15	Protection of cultural heritage	2	2-6	1.49
16	Human right security	2	2-6	1.43
17	Institution building	1	1-3	1.36
18	Infrastructural development	7	7-21	1.24
19	Ecosystem preservation	2	2-6	1.17
20	Right to information	3	3-9	1.05
21	Promotion of moral value	4	0-4	0.98
22	Development facilitatory linkage	2	0-2	0.86

most sufficient, sufficient and least sufficient with scores of 3, 2 and 1 was provided for item 1, full right, partial right and nominal right were given to item 2 with scores of 3, 2 and 1 and fully protected, partially protected and not protected for item 3 with scores of 2, 1 and 0. Any individual attempting this scale will get a score between 2 and 8.

2. Employment and income generation

It means to create regular employment opportunities and sustainable income for the tribal people.

Hardikar (1998) measured employment generation in the sectors like enterprise, agriculture and allied occupation as the additional employment opportunities and income gained by the beneficiaries in these areas after availing the benefits of the programmes.

In this study employment generation and income generation are measured using the scale developed by Surendran (2000) in terms of percentage increase in employment opportunities in the tribal development programmes by developing a scoring procedure. The scoring procedure followed is given below.

Response category	Employment generation	Income generation
Decrease more than 50 %	1	1
Decrease less than 50 %	2	2
Unchanged	3	3
Increase upto 50 %	4	4
Increase above 50 %	5	5

The scores obtained for employment and income generation were added to get the score on this dimension. The possible score to be secured by a respondent on this scale ranges from 2 to 10.

3. Control over minor forest produces

It refers to the control of tribal people on collection and marketing of minor forest produces available in the forest area.

Two items were given under this dimension having scores of 3, 2 and 1 respectively with rarely, sometimes and often for item 1 and most sufficient, sufficient and least sufficient for item 2. Hence the possible score on this item ranges from 2 to 6.

4. Agricultural productivity optimization means the extent to which agricultural productivity of the tribal habitat is sufficient for their sustained living.

Ten items were given under this dimension with provision of greater, somewhat and lesser having scores of 3, 2 and 1. So the total possible score under this dimension ranged from 9 to 27.

Social Sustainability

Social sustainability of tribal development refers to how well a tribe can meet the basic human needs such s food, shelter and clothing. It also involves providing the support services that can improve the quality of tribal life including education, health care, culture and human rights.

1. Food security refers to the extent to which the tribal families get sufficient food for their subsistence living.

The scale consists of four items. Three response categories *viz.*, 'always', 'sometimes' and rarely with scores of 3, 2 and 1 were provided for items 1, 2 and 4 and most adequate, adequate and least adequate for item 3 respectively. Any individual attempting this scale will get a score between 4 and 12.

2. Housing security – refers to the provision of enough housing facilities to the tribal people which are suited to their local settings and without affecting their ecosystem.

This dimension was measured using a four-point continuum, 'strongly agree', 'agree', 'disagree' and 'strongly disagree' with scores 3, 2, 1 and 0 respectively. The possible score of an individual on 4 items under this dimension ranged from 0 to 12.

3. Human resource development

It means the access to education for all tribal people and the extent to which the educational programmes help the tribal people for their capacity building, empowerment and skill development.

Under this dimension, two items were given with a three-point continuum – 'Most adequate', 'Adequate' and 'Least adequate' having scores 3, 2 and 1 respectively for item 1 and six items were given for item 2 with another three point continuum – 'Most emphasis', 'Emphasis' and 'Least emphasis' having scores 3, 2 and 1. A person attempting this scale may get score ranging from 9-27.

4. Health and nutritional security – It means providing promotive, preventive, curative and rehabilitative health services and nutritional security.

The scale consists of 12 items with response categories *viz.*, Most adequate, Adequate and Least adequate bearing scores 3, 2 and 1 and hence the possible score ranges from 12-36.

5. Ethno-development – Ethno development of tribal people refers to the extent to which the tribal people have the right to choose what to conserve and what to change, what to adopt and what to reject from other cultures and all those in what pace and intensity in this fast changing world. The basic principles of ethno-development are self sufficiency, prioritisation of developmental issues, decentralisation, equity and social justice.

This dimension was measured using a four point continuum, strongly agree, agree, disagree and strongly disagree having scores 3, 2, 1

and 0 respectively. Hence the possible scores of an individual on this dimension ranged from 0 to 12.

6. Participation : It means the extent of participation of the respondents in decision making, implementation, monitoring and evaluation of their developmental activities.

The response categories *viz.*, 'Always' 'Sometimes' and 'Rarely' with scores of 3, 2 and 1 was provided for all the three items. Any individual attempting this scale will get a score between 1 and 9.

7. Socio–political empowerment : It refers to the extent of power, status, self-confidence and the opportunity to develop a sense of autonomy and ability to lead their own life by means of participation in the socio political activities.

Under this dimension, one statement was given with a three-point continuum – 'More awareness', 'Less awareness' and 'Least awareness' having scores 3, 2 and 1 and another statement with three point continuum – 'Most adequate', 'Less adequate' and ' Least adequate' having scores 3, 2 and 1. Hence the possible total score of an individual on this dimension ranged from 2 to 6.

8. Strengthening tribal hamlet system : It means the sustenance of tribal hamlet system for the purpose of protecting the value of traditional life supporting system.

This dimension was measured using two statements, first with three response categories *viz.*, greater extent, somewhat and lesser extent with scores 3, 2 and 1 and the second with 'Yes', 'No' responses, bearing scores 1 and 0 respectively. Hence the possible score ranges from 1 to 3.

9. Protection of cultural heritage

This means the protection of identity and ethnic heritage of different tribal groups by the tribal society, government and other development agencies.

Under this dimension, one item was given with a three point continuum – 'More aware', 'Less aware' and 'Least aware' having scores 3, 2 and 1 respectively and another item with three point continuum having scores 3, 2 and 1. Total items included were two. Hence the possible score of an individual on this dimension ranged from 2 to 6.

10. Human rights security – It refers to the provision for protection of human rights of the tribal people by the government

Under this dimension, two items were given with a three-point continuum – 'Strongly protected' 'Protected' and 'Not protected' – having scores 3, 2 and 1 respectively. One item was provided another three-point continuum – 'fully satisfied', 'partially satisfied' and 'not satisfied' having scores 3, 2 and 1 respectively. Hence the total possible score of an individual on this dimension ranged from 2 to 6.

11. Institution building – It refers to establishment and maintenance of local level institutions to make the tribal development sustainable

This is simple statement scale with three response categories *viz.*, 'Most sufficient', 'Sufficient' and 'Least Sufficient' with scores of 3, 2 and 1 respectively. Any individual attempting this scale will get a score between 1 and 3.

12. Infrastructure development – It refers to the development of infrastructure facilities at the tribal hamlets.

The scale consists of seven items. The scoring pattern for this dimension was same as in the case of institution building. The categories of responses with scores 3, 2 and 1 for 'Most sufficient', 'Sufficient' and

'Least sufficient'. Total possible score ranged from 7 to 21 since the items included under this dimension were seven.

13. Right to information : It refers to the rights of the tribal people to be better informed of their rights, privileges and transparency in the implementation of development programmes for them.

Here, the right to information is divided into three parts 1) information on rights and privileges 2) information on development programmes, 3) information on details of expenditure. Under this dimension, a three-point continuum – 'Always', 'Sometimes' and 'Never' having scores 3, 2 and 1 respectively were given. Hence the total possible score of an individual ranged from 3 to 9.

14. Promotion of moral values – It refers to the extent to which the tribal development programmes are oriented towards minimising socially undesirable habits among tribal people and inculcate high morale.

Under this dimension, total four items were given with 'Yes' or 'No' answer with 1 and 0 weightages except for item 2 where the score is reversed. Hence the total possible score of an individual on this dimension ranged from 0 to 4.

15. Development facilitatory linkage

It means that the non-tribal people in the tribal area should act as a linkage with tribal people in facilitating the development interventions in the tribal areas.

This dimension was provided with 'Yes' or 'No' answer with scores 1 and 0 respectively. Any individual attempting this scale will get a score between 0 and 2.

Ecological Sustainability

Ecological sustainability of tribal development means ensuring the protection, conservation and better management of natural resources

particularly those which are so vital for the survival of tribal life.

Under this three dimensions were included *viz.*, resource conservation, ecosystem preservation and indigenous knowledge system.

1. Resource conservation

It means the facilities for conservation of available natural resources of the tribal hamlet in such a way that it can be utilised for their development on a sustainable basis.

Under this dimension the items were given with response categories – 'Most adequately', 'Less adequately' and 'Least adequately' having scores 3, 2 and 1 respectively. The items included under this dimensions were two and hence the possible scores ranged from 2 to 6.

2. Ecosystem preservation : It means all types of developmental interventions in the tribal area must be planned and implemented in such a way that they enrich and preserve the natural ecosystem of tribal people and not harming the ecosystem even to a small extent.

This dimension was provided with two items in a three point continuum of which first item having response categories 'Excellent', 'Good' and 'Poor' with scores 3, 2 and 1 respectively and second item was provided with response of 'Most able', 'Somewhat able' and 'Not able' having scores 3, 2 and 1 respectively. Any individual attempting this scale will get a score between 2 and 6.

3. Indigenous knowledge system – It refers to the conservation and protection of available indigenous knowledge with the tribal people in relation with all walks of human life.

The measurement of this dimension was done with three items having a dichotomous response 'Yes' and 'No' bearing weightages 1 and 0 respectively. Since item 1 is negative scoring was reversed. Any individual attempting this scale will get a score between 0 and 3.

Reliability of the scale

A good instrument should evoke responses that are valid and yield nearly the same results if administered twice to the same respondents (Goode and Hatt, 1952). Reliability is the accuracy or precision of a measuring instrument (Kerlinger, 1964). Test-retest method was used in the present study to assess the reliability of the sustainable tribal development index.

The scale was administered to 20 respondents in a non-sample area *viz.*, Amboori panchayat and responses were collected from the same respondents after an interval of two weeks. Two sets of scores thus obtained were correlated using Pearson product moment correlation. The correlation coefficient (0.91) was found significant at 0.01 level of significance, establishing very good reliability for the scale.

Validity of the scale

An index of validity helps to ascertain whether the instrument measures what it intended to measure. The scale developed in the study was tested for the content validity.

Content validity : The main criterion for content validity is how well the contents of the scale represent the subject matter under study. In developing the scale for the present study, the area of sustainable tribal development was split into 35 dimensions, then subjected to rigorous editing and the contents had been passed through for expert judgment for the relevancy of the content to the subject matter under study. Based on the expert judgment, 22 dimensions were selected and the scale values were also worked out for these selected dimensions using scientific procedures. These thorough and rigorous procedures followed in developing the scale automatically ensured high content validity for the scale.

3.3.1.3 Administration of the Scale

Sustainable Tribal Development Index (STDI)

Based on the weightages assigned to economic, social and ecological sustainability by the judges through Policy Delphi Method, the STDI (composite index) is measured for each respondent using economic, social and ecological sustainability indices.

Economic Sustainability Index (ESI)

$$ESI = \frac{\Sigma \left[\frac{e_i}{E_i}\right] R_{e_i}}{\Sigma R_{e_i}} \times 100$$

Where e_i = score obtained for the i^{th} dimension of economic sustainability

E_i = Maximum score obtained for the i^{th} dimension of economic sustainability

R_{ei} = Scale value of i^{th} dimension of economic sustainability

ΣR_{ei} = Summation of the score of i^{th} dimension of economic sustainability

Social Sustainability Index (SSI)

$$SSI = \frac{\Sigma \left[\frac{s_i}{S_i}\right] R_{s_i}}{\Sigma R_{s_i}} \times 100$$

Where, s_i = Score obtained for the i^{th} dimension of social sustainability

S_i = Maximum score of the i^{th} dimension of social sustainability

R_{si} = Scale of the i^{th} dimension of social sustainability

ΣR_{si} = Summation of the scores of i^{th} dimension of social sustainability

Ecological Sustainability Index (EcSI)

$$ECSI = \frac{\Sigma\left(\frac{ec_i}{E_{c_i}}\right)R_{ec}}{\Sigma R_{ec_i}} \times 100$$

Where ec_i = Score obtained for the i^{th} dimension of ecological sustainability

E_c = Maximum score of the i^{th} dimension of ecological sustainability

R_{ec} = Scale value of the i^{th} dimension of ecological sustainability

ΣR_{ec} = Summation of the scores of i^{th} dimension of ecological sustainability

Sustainable Tribal Development Index (STDI)

$$STDI = \frac{W_1(ESI) + W_2(SSI) + W_3(EcSI)}{W_1 + W_2 + W_3}$$

ESI = Economic Sustainability Index

SSI = Social Sustainability Index

EcSI = Ecological Sustainability Index

W_1 = Weightage for the economic sustainability dimensions

W_2 = Weightage for the social sustainability dimensions

W_3 = Weightage for the ecological sustainability dimensions

The STDI is developed in such a manner that when a respondent attains maximum economic, social and ecological sustainability the index value reaches 100 per cent. The minimum value the index can take is zero per cent. STDI is a composite index of economic, social and ecological sustainability indices which has been measured for 200 respondents under study.

3.3.2 Measurement of Factors Influencing Sustainable Tribal Development Index

Based on the review of literature, the pilot study conducted, discussion with experts and judges rating 10 factors were selected for the study from among the 19 factors. The selected variables are as follows (Appendix III).

I Socio-economic Status

Chapin (1928) defines socio-economic status as the position an individual or a family occupies with reference to the prevailing average standards of cultural possessions, effective income, material possession and participation in the group activities of the community.

The socio economic status scale developed by Trivedi (1963) was suitably modified and used to suit the present conditions prevailing in Kerala.

The items coming under this category are education, land holding, occupation, farm power, house, family and social participation.

The assignment of scores for the various items in socio economic status scale was as follows.

Education

Education is defined as the level of education attained by the respondent. Education was measured using the scale developed by Trivedi (1963).

	Education	Scores		Scores
1	Illiterate	0	Primary	3
2	Can read only	1	Middle school	4
3	Can read and write	2	High school	5
			College and above	6

Land Holdings – refers to the extent of land possessed by the respondent at the time of investigation.

Land Holding	Score
No land	0
Less than 10 cents	1
10-25 cents	2
26-50 cents	3
0.51-1 acre	4
More than 1 acre	5

Occupation

Occupation refers to the vocation of the respondent which provide income and in which he spends major part of his time and attention. The scoring pattern is as follows.

Agricultural labourers	1
Collection of Minor forest produces	2
Business (specify)	3
Independent profession	4
Own cultivation (farming)	5

Social participation

Social participation refers to the extent and nature of participation of tribe in various activities of social organisations. The procedure used by Lokhande (1973) was used with slight modification.

No membership in any social organisation-0

Membership in one organisation-1

Office bearer - 2

Frequency of participation

Regularly	-	2
Occasionally	-	1
Never	-	0

House

No house	-	0
Hut (one room)	-	1
Thatched house	-	2
Pucca house	-	3

Farm power

No draught animal	-	0
1-2 animals	-	1
3-4 animals	-	2
Power tiller/ tractor	-	3
Any other	-	4

Family

Single	-	1
Nuclear	-	2
Joint	-	3

Summation of scores over all the six variables included in the socio-economic scale forms the socio-economic scores of the individual respondent. The socio-economic status scores and its median were calculated. Above median represented high socio- economic status and below the median low socio economic status.

II. Land Alienation

It is defined as the area of land sold out or transferred to others on any account by the respondent.

Mathur (1975) and Prakash (1980) used index of land alienation for measuring this variable in which the land alienation was measured in land units in acres.

In the present study the scale used by Prakash (1980) was used with necessary modification. Here the extent of land alienation was measured in land units *i.e.,* acres transferred by a tribe to others.

The median was taken as the basis for classification of respondents into high and low.

III Indebtedness

Indebtedness is operationally defined as the total debt in terms of money, a tribe owes to various money lending sources at the time of investigation.

The scale developed by Sabapathi (1988) was used with slight modification to measure indebtedness. The respondents were categorised into the following groups on the basis of the total debt they had at the time of interview and the score assigned were as follows.

Item	Score
No debt	5
Debt up to Rs 1000	4
1001-2000	3
2001-3000	2
3001-5000	1
above 5000	0

IV Level of aspiration

It refers to the tribe's overall assessment of his concern for wishes and hopes for the future in his own reality world.

Level of aspiration in this study was measured using the scale developed by Pradeepkumar (1993) with necessary modification. The scale consists of eight items with 'Yes' or 'No' answers for each item. One and zero scores were assigned to 'Yes' and 'No' answer respectively. The scores obtained for each item was summated to get the score on level of aspiration. The possible score ranges from 0 – 8.

V ECONOMIC MOTIVATION

It was operationalised in terms of the relative value placed by a respondent on economic ends.

In the present study, this was measured using the scale developed by Supe (1969).

The scale consists of five statements, the responses were collected in a five point continuum *viz.,* strongly agree, agree, undecided, disagree and strongly disagree with assigned scores of 5, 4, 3, 2 and 1 respectively for positive statements. The scoring was reversed in the case of negative statements. The scores obtained by an individual on all statements were added up to get the economic motivation score of the individual. Based on the mean score, respondents were categorized into high and low.

VI Guidance and supervision

It refers to the regular technical guidance and supervision provided by the Extension Staff in implementing tribal development programmes.

Guidance and supervision in this study was measured using the scale developed by Surendran (2000). The scale consists of three items with 'Yes' or 'No' answer for each item. One and zero scores were assigned to 'Yes' and 'No' answer respectively. The scores obtained for each item were summated to get the score on guidance and supervision. The possible score ranged from 0 – 3.

VII Orientation towards incentives

It refers to the orientation of tribal respondents towards the incentives and assistance provided by the government and other development agencies for tribal welfare.

This was measured by using the scale developed by Surendran (2000) with slight modification. The scale consists of three items against four point continuum from strongly agree to strongly disagree. The scoring adopted was as follows.

Responses	Strongly agree	Agree	Disagree	Strongly disagree
Positive item score	4	3	2	1
Negative item score	1	2	3	4

The scores of the respondent and median were calculated. Above the median was taken as high orientation group and below the median as low orientation group.

VIII External interference

External interference is operationally defined as the extent to which external agencies or people interfere in the development of tribals.

In the present study this was measured using the scale developed for the purpose.

The scale consists of five statements, the responses were collected in a five point continuum as strongly agree, agree, undecided, disagree and strongly disagree with assigned scores of 5, 4, 3, 2 and 1 respectively for positive statements. The scoring was reversed in the case of negative statements. The scores obtained by an individual on all statements were added up to get the external interference score of the individual. Mean score was calculated and respondents were classified into low and high groups on the basis of mean.

IX Political interference

It refers to the extent to which over emphasis is given to political consideration in the implementation of tribal development programmes.

In this study political determinism was measured using the scale developed by Surendran (2000) with necessary modification. The scale consists of four items with 'Yes' or 'No' answer for each item. One and

zero scores were assigned to 'Yes' and 'No' answer respectively. The scores on individual items were summated to get the score on political interference. The possible score ranges from 0 – 4.

X Value orientation

It is defined as the belief held by the tribals that human situations and acts are pre-determined by some supernatural power and their positive attitude towards traditional institutions and practices.

In this study value orientation of the tribe was measured using the scale developed by Reddy (1974) and used by Sushama (1979) with slight modification. This scale consisted of 6 items with four response categories ranging from strongly agree to strongly disagree. The scoring adopted was as follows.

Responses	Strongly agree	Agree	Disagree	Strongly disagree
Positive item score	4	3	2	1
Negative item score	1	2	3	4

The scores of the respondents and median were calculated. Above median was taken as high value orientation and below median as low value orientation. The possible score ranges from 6 to 24.

3.3.3 Extent of Inclusion of Dimensions of Sustainable tribal Development in the Selected Tribal Development Programmes

To measure the extent of inclusion of dimensions of sustainable tribal development in the selected tribal development programmes, the same interview schedule used for measuring sustainable tribal development index was used with slight modifications in the context of tribal development programmes

Index for measuring tribal development programmes

To measure the extent of inclusion of dimensions of sustainable tribal development in the selected tribal development programmes, an index was developed for each programme based on the effective number of the respondents for all the 22 dimensions. The index values were developed by taking the average of the proportions of scores (score obtained / maximum score) and then converting it into percentage over the effective number of respondents (effective number of respondents indicate the number of respondents who are associated with the development programmes).

Tribal Development Programme Index (TDPI)

$$\frac{\sum_{i=1}^{K} \left(\frac{ei}{Ei}\right)}{K} \times 100$$

Where, ei = Score obtained for each respondent for each scheme
Ei = Maximum score obtained for each respondent for each scheme
K = Effective number of respondents

3.4 STATISTICAL TOOLS USED

The data collected from the respondents were scored, tabulated and analysed using following statistical methods.

Mean

The respondents were classified into low groups and high groups for the dependent and independent variables based on the respective mean scores.

Percentage Analysis

To make simple comparisons percentage analysis was done.

Correlation Analysis

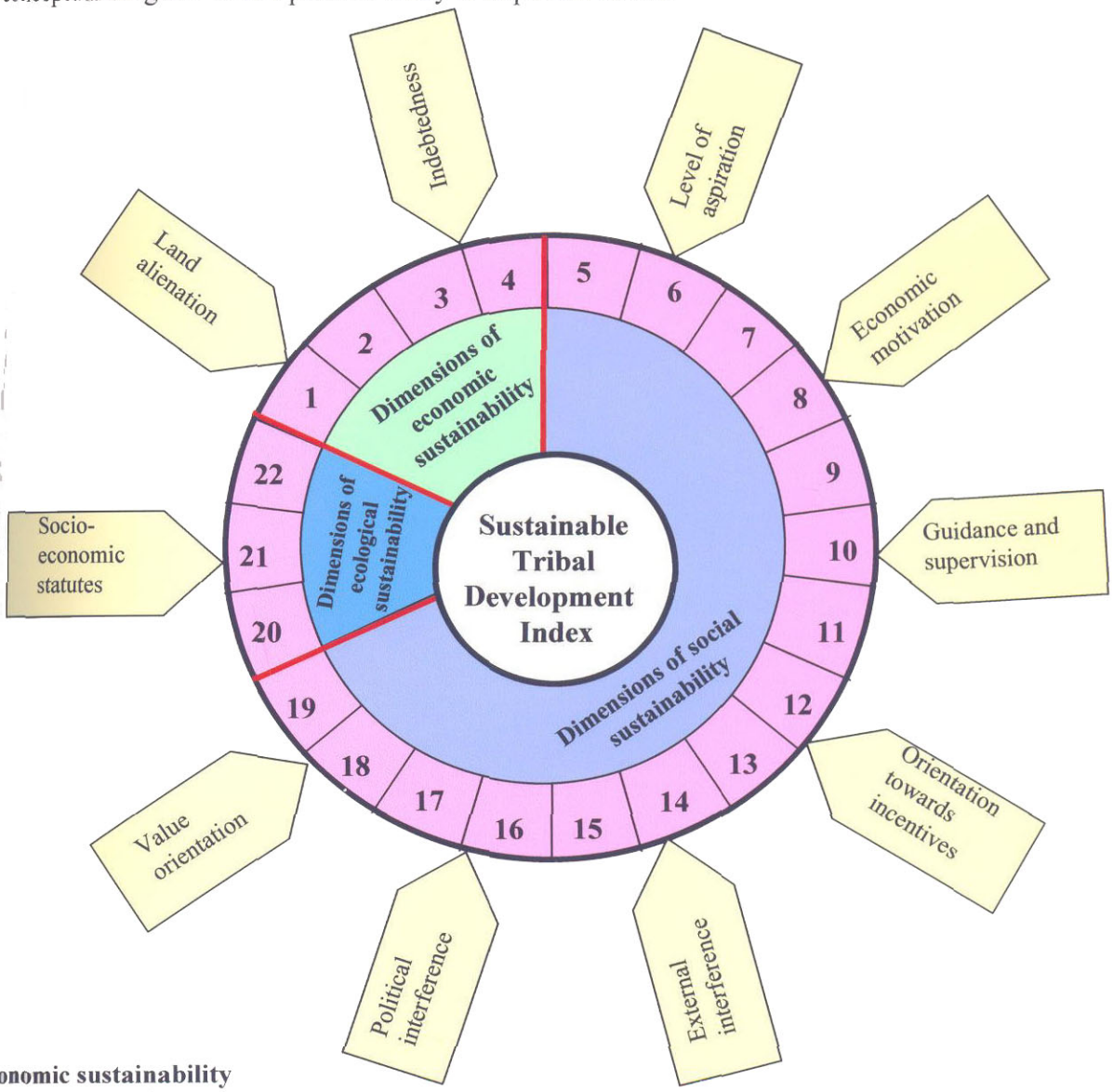
To find out the relationship between the independent (X) and dependent (Y) variables the Pearson product moment correlation (r) was used.

Principal Component Analysis

The components determining economic sustainability, social sustainability and ecological sustainability of sustainable tribal development were represented by means of measurements over a number of dimensions. By principal component analysis, it is possible to concentrate on those dimensions or linear combinations of the dimensions, which are mainly responsible for the variation in sustainable tribal development index among the respondents. The total variability present in the data are divided into different components such that each component is a linear combination of the different dimensions. These combinations are called principal components. The procedure of finding these functions is by applying orthogonal transformations to the original set of variables (Hotelling, 1943). Here a multidimensional data set is reduced to a space of low dimensions.

3.5 CONCEPTUAL MODEL OF THE STUDY

On the basis of review of literature and insights gained during the pilot study, the conceptual diagram of the present study is depicted below.



Economic sustainability

1 Control over land resources
2 Employment and income generation
3 Control over minor forest produces
4 Agricultural productivity optimization

Social sustainability

5 Food security
6 Housing security
7 Human resource development
8 Health and nutritional security
9 Participation
10 Ethno-development
11 Socio-political empowerment
12 Protection of cultural heritage
13 Institution building
14 Infrastructure development
15 Strengthening hamlet system
16 Right to information
17 Human right security
18 Promotion of moral values
19 Development facilitatory linkage

Ecological sustainability

20 Resource conservation
21 Ecosystem preservation
22 Indigenous knowledge system

Fig. 2. Conceptual model of the study

Results and Discussion

4. RESULTS AND DISCUSSION

Keeping the objectives of the study in view, the results and discussion are presented in the following sections.

4.1 Dimensions of Sustainable Tribal Development Index

4.1.1 Dimensions of Economic Sustainability Index

4.1.2 Dimensions of Social Sustainability Index

4.1.3 Dimensions of Ecological Sustainability Index

4.2 Sustainable Tribal Development Index

4.2.1 Development of Economic Sustainability Index

4.2.2 Correlation of Dimensions of Economic Sustainability with Economic Sustainability Index Value

4.2.3 Principal Component Analysis of Economic Sustainability

4.2.4 Development of Social Sustainability Index

4.2.5 Correlation of Dimensions of Social Sustainability with Social Sustainability Index Value

4.2.6 Principal Component Analysis of Social Sustainability

4.2.7 Development of Ecological Sustainability Index

4.2.8 Correlations of Dimensions of Ecological Sustainability with Ecological Sustainability Index Value

4.2.9 Principal Component Analysis of Ecological Sustainability

4.3 Sustainable Tribal Development Index Value of nine panchayats in three districts

4.3.1 Correlation of dimensions of Sustainable Tribal Development Index with Sustainable Tribal Development Index value

4.4 Distribution of respondents based on Sustainable Tribal Development Index value

4.4.1 Distribution of respondents based on dimensions of economic sustainability index

4.1 DIMENSIONS OF SUSTAINABLE TRIBAL DEVELOPMENT INDEX (STDI)

Various dimensions of Sustainable Tribal Development Index under the three major sub dimensions of economic, social and ecological sustainability indices were identified using Nominal Group Technique and these dimensions were further prioritized using Policy Delphi Technique as described in the Methodology chapter.

4.1.1 Dimensions of Economic Sustainability Index

Table 16. Dimensions of Economic Sustainability Index with respective relevancy index and scale value (n = 72)

Sl. No.	Dimensions	Relevancy index	Scale value
1.	Control over land resources	99.42	2.82
2.	Employment and income generation	98.33	2.50
3	Control over minor forest produces	97.50	2.44
4	Agricultural productivity optimization	96.60	2.25

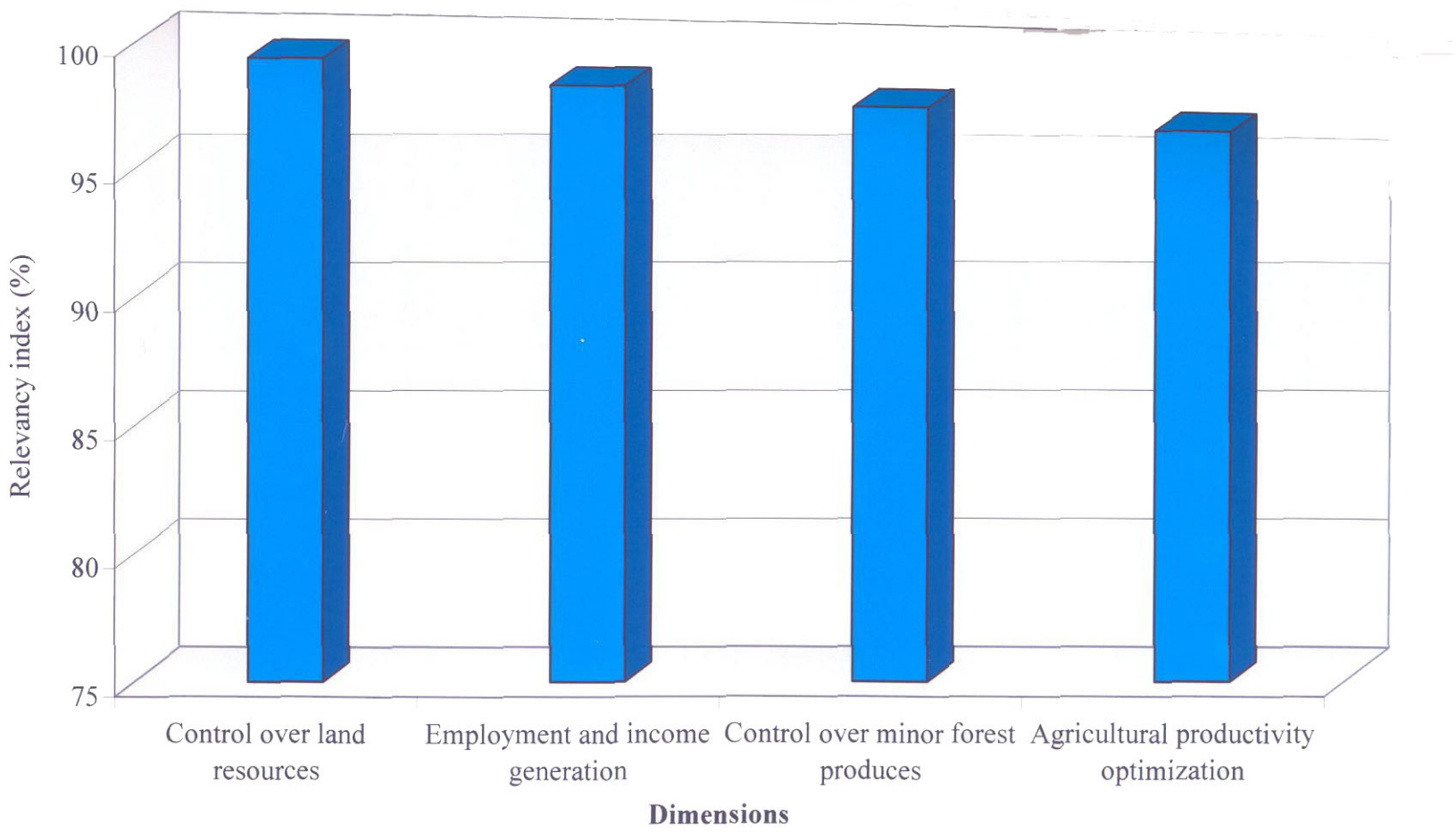


Fig. 3. Relevancy index of the dimensions of economic sustainability

Table 16 shows the relevancy index of all category of respondents namely scientists, officials of Tribal Development Department, social workers and tribal leaders/activists used in Policy Delphi Technique to delineate the dimensions of economic sustainability. It could be observed that the maximum relevancy index (99.42) and scale value (2.82) was obtained for control over land resources followed by employment and income generation (98.33 and 2.50), control over minor forest produces (97.50 and 2.44) and agricultural productivity optimization (96.60 and 2.25) (Fig. 3).

4.1.2 Dimensions of Social Sustainability Index

Table 17. Dimensions of Social Sustainability Index with respective relevancy index and scale value (n = 72)

Sl. No.	Dimensions	Relevancy index	Scale value
1.	Food security	98.88	2.63
2.	Housing security	97.77	2.57
3	Human resource development	96.94	2.31
4	Health and nutritional security	96.11	2.12
5	Participation	94.44	2.00
6	Ethno-development	91.38	1.93
7	Socio-political empowerment	89.72	1.81
8	Protection of cultural heritage	89.44	1.74
9	Institution building	87.77	1.43
10	Infrastructure development	84.72	1.36
11	Strengthening hamlet system	82.50	1.24
12	Right to information	81.11	1.17
13	Human right security	80.83	1.05
14	Promotion of moral values	77.50	0.98
15	Development facilitatory linkage	75.55	0.86

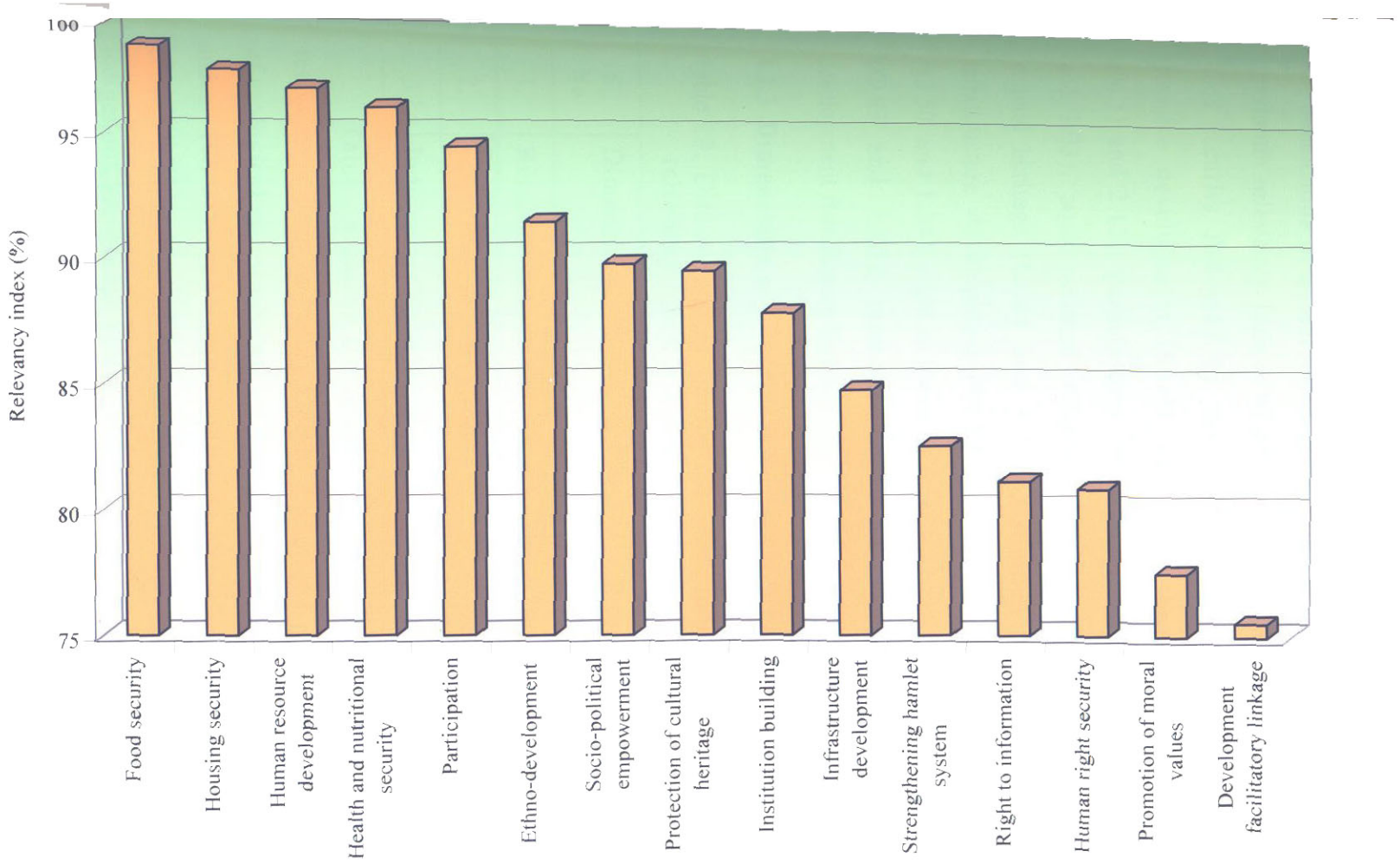


Fig. 4. Relevancy index of the dimensions of social sustainability

Table 17 reveals the relevancy index computed from the ratings of all categories of respondents used in Policy Delphi Technique to delineate the dimensions of social sustainability index. It could be observed that the maximum relevancy index (98.88) and scale value (2.63) was obtained for food security followed by housing security (97.77 and 2.57), human resource development (96.94 and 2.31), health and nutritional security (96.11 and 2.12), participation (94.44 and 2.00), ethno-development (91.38 and 1.93), socio-political empowerment (89.72 and 1.81), protection of cultural heritage (89.44 and 1.74), institution building (87.77 and 1.43), infrastructure development (84.72 and 1.36), strengthening hamlet system (82.50 and 1.24), right to information (81.11 and 1.17), human right security (80.83 and 1.05), promotion of moral values (77.50 and 0.98) and development facilitatory linkage (75.55 and 0.86) (Fig. 4).

4.1.3 Dimensions of Ecological Sustainability Index

Table 18. Dimensions of Ecological Sustainability Index with respective relevancy index and scale value (n = 72)

Sl. No.	Dimensions	Relevancy index	Scale value
1.	Resource conservation	96.94	1.68
2.	Ecosystem preservation	95.27	1.62
3	Indigenous knowledge system	92.50	1.49

Table 18 shows the relevancy index obtained by all categories of respondents used in Policy Delphi Technique to delineate the dimensions of ecological sustainability. It could be observed that maximum relevancy index (96.94) and scale value (1.68) was obtained for resource conservation followed by ecosystem preservation (95.27 and 1.62) and indigenous knowledge system (92.50 and 1.49) (Fig. 5).

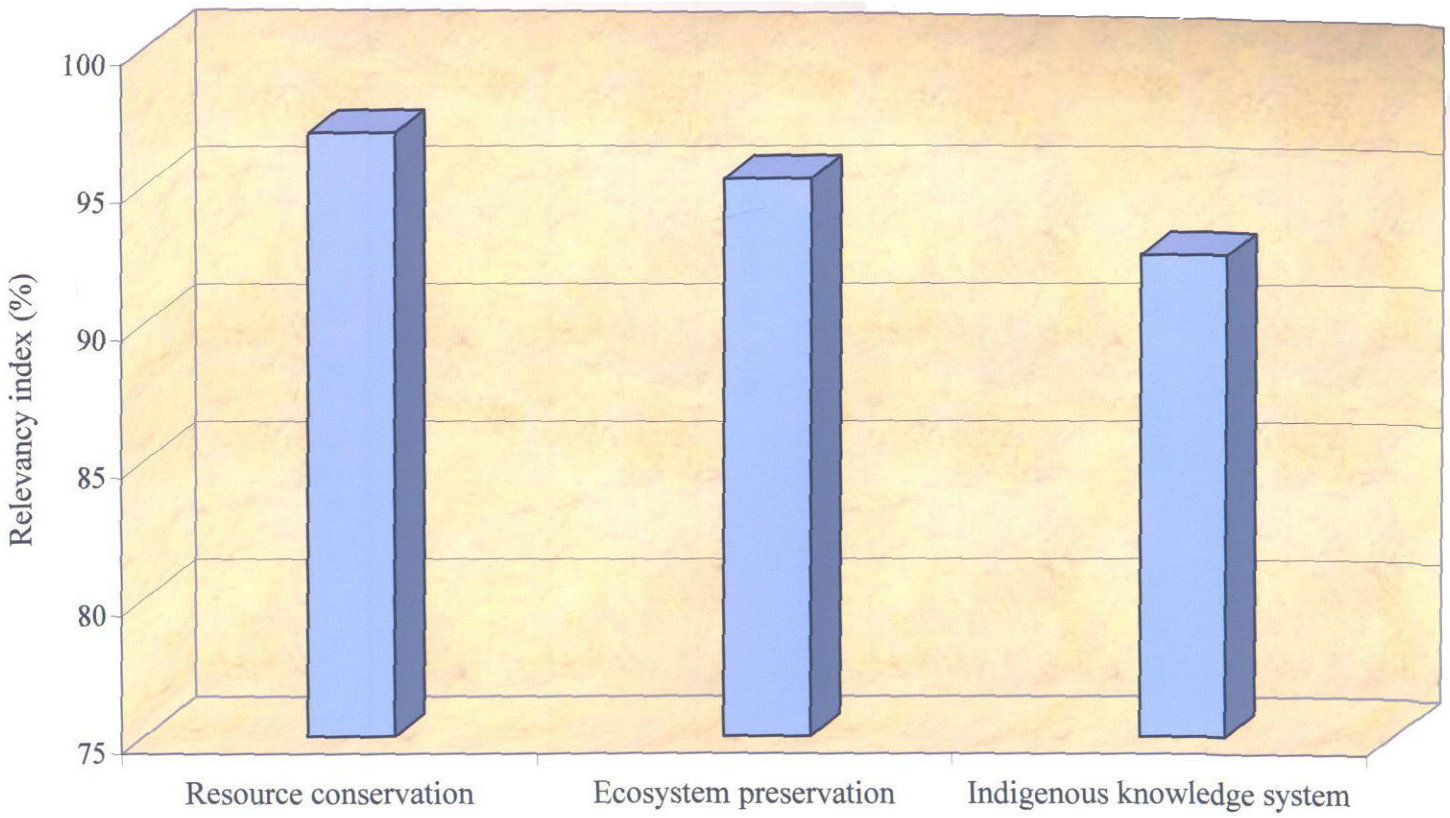


Fig. 5. Relevancy index of dimensions of ecological sustainability

4.2 SUSTAINABLE TRIBAL DEVELOPMENT INDEX VALUE (STDIV)

4.2.1 Development of Economic Sustainability Index Value (ESIV)

The economic sustainability index was used as tool to assess the extent of economic sustainability of tribal people accrued out of tribal development programmes so far implemented. The four dimensions of sustainability constitute to form the ESIV (Table 16).

Based on the scores obtained by applying the economic sustainability index, the economic sustainability index value of respondents of nine panchayats in three districts were calculated. The procedure adopted in the development of economic sustainability index was described in the methodology chapter. Table 19 and Fig. 6 shows the district wise distribution of ESIV of tribal respondents.

Table 19 Comparison of average economic sustainability index value – district and panchayats wise (N = 200)

Districts	Average ESIV of district	ESIV of panchayats			CD (Panchayats)
		P_1	P_2	P_3	
Palakkad	15.81	23.63	11.79	12.03	P_1-P_2 = 3.21 P_1-P_3 = 2.77 P_2-P_3 = 3.84
Idukki	13.25	P_4	P_5	P_6	P_4-P_5 = 3.91 P_4-P_6 = 4.06 P_5-P_6 = 3.91
		12.83	11.82	15.10	
Wayanad	8.73	P_7	P_8	P_9	P_7-P_8 = 2.02 P_7-P_9 = 2.50 P_8-P_9 = 2.51
		9.10	9.27	7.84	

P_1 Agali P_2 Muthalamada P_3 Perumatti
P_4 Kanthalloor P_5 Velliyamattom P_6 Arakkulam
P_7 Kaniyampetta P_8 Noolpuzha P_9 Thirunelli

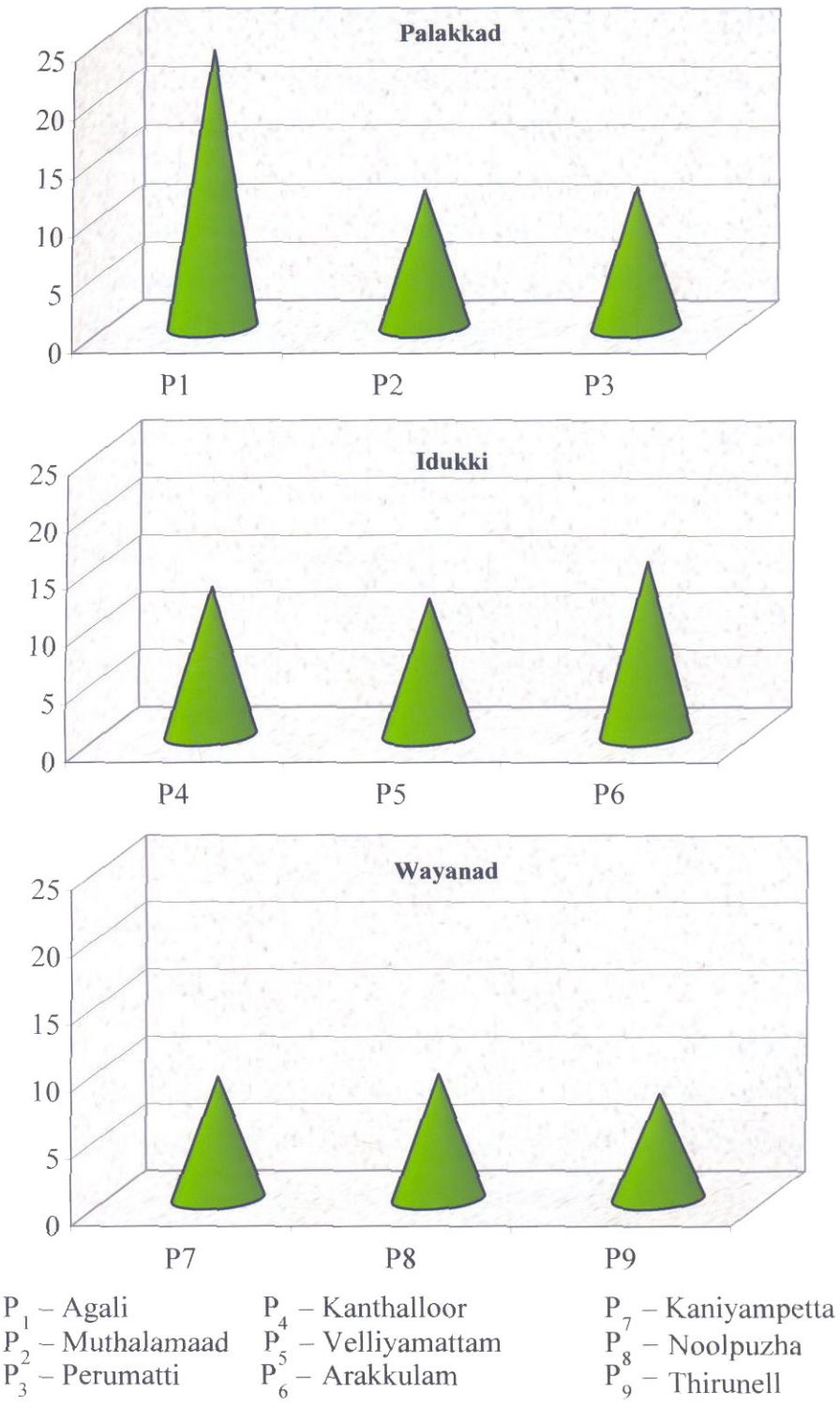


Fig. 6. Comparison of economic sustainability index value of nine panchayats in three districts

The results in Table 19 and Fig. 6 reveals that the highest ESIV is only 15.81 observed in Palakkad district. When the highest value is very low which indicate very low economic development of tribes in Kerala. In spite of the massive expenditure by the government for the economic development of tribes, their economic sustainability is still in the darkness. So this is to be seriously looked into by the Government and take care of all measures to ensure economic sustainability. Provision of cultivable land, maximizing the agricultural productivity, creating employment and income generating activities through rural micro-enterprises etc. are the suggested strategy for ensuring economic sustainability of tribes in Kerala.

The result also shows that Palakkad district had the highest ESIV (15.81) followed by Idukki (13.25) and the least in Wayanad (8.73). This might be due to reason that the tribes in Palakkad district is having more agricultural land and thereby control over their land resources. Income generation from agricultural sector is more in Palakkad district compared to the other two districts. Economic development schemes implemented by the government in the past in Palakkad district especially in Attapadi block may be the other reason.

When we compare between panchayats Agali panchayat in Attappadi block is having more economic sustainability compared with Muthalamad in Kollengode block and Perumatti in Chittoor block. This may be due to the reason that tribes in Agali panchayats is having more agricultural land under possession and cultivation and having more control over their land resources and thereby their income generation is also more.

In Idukki district critical difference in economic sustainability exists between Kanthalloor panchayat in Devikulam block and Arakkulam panchayat in Idukki block. This may be due to the reason that the tribes in Arakkulam having more control over land resources and substantial income from their employment.

Wayanad is the district where economic sustainability of tribal people is very poor compared to other two districts. The reason may be that majority of tribes are agricultural labourers having no cultivable land and no control over their land resources. Employment and income generation is also very poor. Their only economic activity is the collection of minor forest produces which is also not sustainable. Because of deforestation, encroachment of forest by the settlers and forest dwellers, their major economic activity of collecting minor forest produces were also decreased. This again seriously affected their sustainable income from the forest. In this district no much critical difference exists between three panchayats - Thirunelli, Noolpuzha and Kaniyampetta.

4.2.2 Correlation of Dimensions of Economic Sustainability with Economic Sustainability Index Value (ESIV)

The degree of the linear relationship of four dimensions of economic sustainability with ESIV was found out by correlation analysis. The result is presented in Table 20.

Table 20. Correlation of dimensions of economic sustainability with ESIV

Dimensions	Mean	Variance	Correlation coefficient (r)
Control over land resources	0.80	0.52	0.87**
Employment and income generation	1.41	1.09	0.80**
Control over minor forest produces	0.70	0.59	0.74**
Agricultural productivity optimization	3.54	6.51	0.60**

The perusal of the data presented in Table 20 indicates the relationship of dimensions of economic sustainability with ESIV. The test for statistical significance for correlation coefficient (r) was made at 0.05 and 0.01 level of probability. All the four dimensions had significant and positive relationship with ESIV at 0.01 level. The 'r' value indicate the high coefficient of consistency and establish internal consistency reliability.

The high correlation coefficient in the present study clearly indicate that the dimensions included in the study were not extraneous but rather form the part of ESIV. The positive and significant correlation of all components to ESIV justified the important assumption that the dimensions included in the economic sustainability index have significant association with economic sustainability perceived by the respondents. The dimension of control over land resources is having more correlation (r = 0.87) with economic sustainability followed by employment and income generation (r = 0.80), control over minor forest produce (r = 0.74) and agricultural productivity optimization (r = 0.60).

4.2.3 Principal Component Analysis of Economic Sustainability

The results of the principal component analysis based on four dimensions of economic sustainability are presented in Table 21 and 22. For these four dimensions, there will be four vectors.

The table shows the relative contribution of the four dimensions (VAR 1, VAR 2, VAR 3 and VAR 4) in their linear combinations given by the four principal components (Fig. 7).

Table 21. Result of principal component analysis of dimensions of economic sustainability

Variables / Dimensions	Principal components			
	1	2	3	4
VAR-1	0.974	-0.186	0.131	0.005
VAR-2	0.159	0.958	0.182	-0.154
VAR-4	0.130	0.219	-0.679	0.688
VAR-3	-0.099	-0.003	0.699	0.709

VAR – 1 : Control over land resources

VAR – 2 : Employment and income generation

VAR – 3 : Control over minor forest produces

VAR – 4 : Agricultural productivity optimization

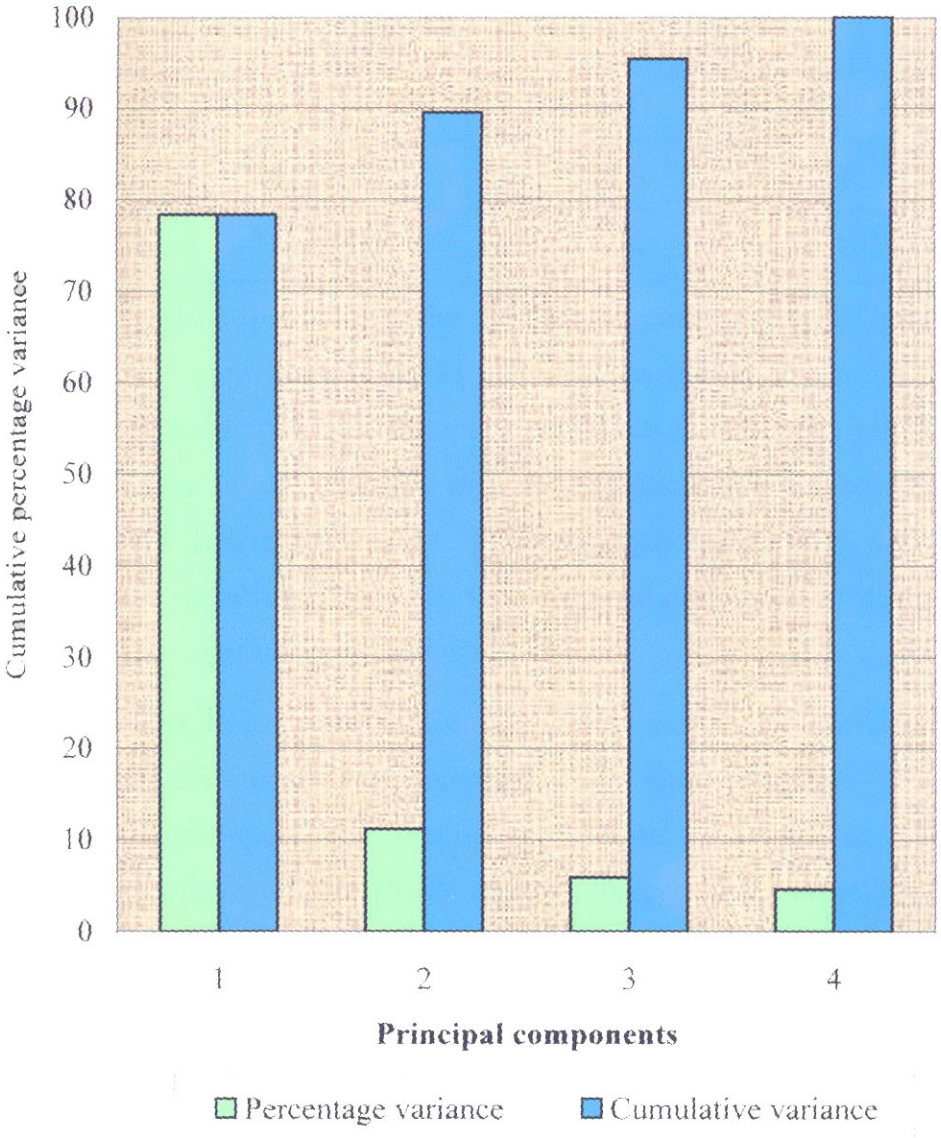


Fig. 7. Percentage variance and cumulative variance contributed by dimensions of economic sustainability under principal component analysis

Table 22. Percentage of variance and cumulative variance contributed by dimensions of economic sustainability

Principal components	Latent root	Percentage variance	Cumulative variance
1	1365.894	78.321	78.321
2	194.504	11.153	89.474
3	102.869	5.899	95.372
4	80.716	4.628	100.00

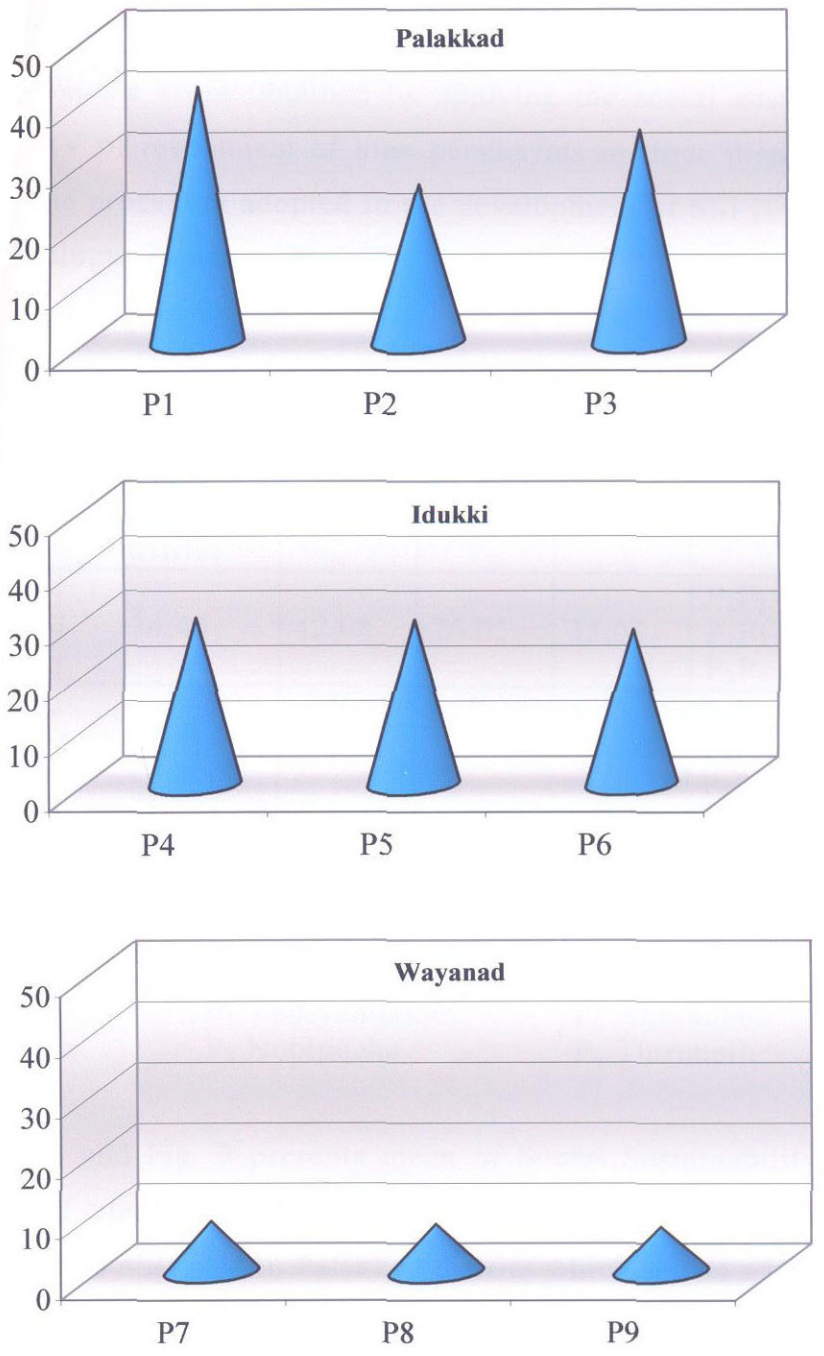
The results indicated that the first linear combination of principal component itself contributed 78.321 per cent to the total variation, the second linear combination of principal component contributed 11.153 per cent to the total variation, the third principal component contributed 5.899 per cent and the fourth principal component contributed only 4.628 per cent to the total variation. Thus the first linear combination of dimension yielded 78.32 per cent of total variance.

In the first linear combination, larger magnitude of variation was contributed by dimensions *viz.*, control over land resources (VAR-1) followed by employment and income generation (VAR-2), agricultural productivity optimization (VAR-4) control over minor forest produces (VAR-3).

The findings indicate that the dimension *viz.*, control over land resources (VAR-1), employment and income generation (VAR-2) contributed higher magnitude of variation followed by agricultural productivity optimization and control over minor forest produces in that order. The results of correlation with ESIV confirms the above findings. .

4.2.4 Development of Social Sustainability Index Value (SSIV)

The social sustainability index was used as a tool to assess the extent of social sustainability attained by the tribal people as a result of tribal development programmes so far implemented. The 15 dimensions



P_1 – Agali
P_2 – Muthalamaad
P_3 – Perumatti
P_4 – Kanthalloor
P_5 – Velliyamattam
P_6 – Arakkulam
P_7 – Kaniyampetta
P_8 – Noolpuzha
P_9 – Thirunell

Fig. 8. Average social sustainability index value - panchayats wise

of social sustainability constitute to form the Social Sustainability Index (SSI) (Table 23 and Fig. 8).

Based on the score obtained by applying the social sustainability index, the SSIV of respondent of nine panchayats in three districts were calculated. The procedure adopted in the development of SSI is described in the methodology chapter.

Table 23. Comparison of average social sustainability index value – district wise and panchayat wise N = 200

Districts	Average ESIV of district	ESIV of panchayats			CD (Panchayats)
		P_1	P_2	P_3	
Palakkad	34.40	42.08	26.05	35.07	P_1P_2 = 3.43 P_1P_3 = 2.97 P_2P_3 = 4.12
		P_4	P_5	P_6	
Idukki	29.31	30.15	29.78	28.01	P_4P_5 = 3.50 P_4P_6 = 3.64 P_5P_6 = 3.51
		P_7	P_8	P_9	
Wayanad	7.95	8.42	7.95	7.49	P_7P_8 = 1.19 P_7P_9 = 1.47 P_8P_9 = 1.48

P_1 Agali P_2 Muthalamada P_3 Perumatti
P_4 Kanthalloor P_5 Velliyamattom P_6 Arakkulam
P_7 Kaniyampetta P_8 Noolpuzha P_9 Thirunelli

Table 23 and Fig. 8 presents mean of Social Sustainability Index Value (SSIV) of tribal respondents. The results indicates that the highest SSIV is only 34.40 observed in Palakkad district which shows a low social development of tribes in Kerala. Inspite of the massive expenditure by the government for the development of tribes, the question of sustainability of development still exists. This may be due to the non-realistic planning and implementation of the tribal development programmes.

The results also indicate that Palakkad district had the highest SSIV (34.40) followed by Idukki (29.31) and the least in Wayanad (7.95). This

wide gap might be due to the reason that tribes in Palakkad district were having more access to dimensions of food security, housing security, health and nutritional security, human resource development and participation etc. The huge amount of funds spent for tribal development in Attappadi block by the Government and other agencies may be the other reason.

In this district substantial differences in social sustainability exist among the three panchayats. The tribes in Agali panchayat in Attappadi block is significantly superior over the other two panchayats in social sustainability. This may be due to the reason that more number of development schemes in social sustainability sector were implemented in Agali panchayats due to the huge flow of government/NGO funds in Attappadi block.

4.2.5 Correlation of Dimensions of Social Sustainability with Social Sustainability Index Value (SSIV)

The degree of relationship of 15 dimensions of social sustainability with SSIV was found out by calculating Pearson Product Moment Correlation Coefficient (r). The result is presented in Table 24.

The perusal of data presented in Table 24 indicates the relationship of dimensions of social sustainability with social sustainability index value. The test for statistical significance for correlation coefficient (r) was made at 0.05 and 0.01 level of probability. The results revealed that 12 dimensions had significant and positive association with social sustainability index value at 0.01 level. It is also observed that three dimensions - strengthening hamlet system, promotion of moral value, development facilitatory linkage had no significant relationship with social sustainability index value. Among the 12 dimensions, food security shows very high positive and significant correlation with social sustainability index value followed by health and nutritional security, housing security, participation etc.

Table 24. Correlation of dimensions on social sustainability with SSIV

N = 200

Sl. No.	Dimensions	Mean	Variance	Correlation coefficient (r)
1.	Food security	3.75	11.23	0.90**
2.	Housing security	1.83	2.33	0.80**
3	Human resource development	4.55	18.69	0.71**
4	Health and nutritional security	5.67	18.85	0.81**
5	Ethno-development	1.89	2.46	0.77**
6	Participation	1.83	2.33	0.80**
7	Socio-political empowerment	0.89	0.64	0.66**
8	Strengthening hamlet system	0.53	0.34	0.18
9	Protection of cultural heritage	0.44	0.25	0.79**
10	Human right security	2.23	2.57	0.74**
11	Institution building	0.76	0.63	0.53**
12	Infrastructure development	6.29	21.82	0.69**
13	Right to information	0.75	0.47	0.46**
14	Promotion of moral values	0.49	0.30	0.13
15	Development facilitatory linkage	0.45	0.28	0.07

The high correlation coefficient in the present study clearly indicates that the dimensions included in the study were not extraneous but rather form the part of social sustainability index value. The positive and significant correlation of 12 dimensions of social sustainability index justified the important assumption that dimensions included in the social sustainability index have significant association with social sustainability of tribes.

4.2.6 Principal Component Analysis of Social Sustainability

The results of the Principal Component Analysis (PCA) based on 15 dimensions of social sustainability are presented in Table 25. For these 15 dimensions there will be 15 vectors, 10 of which that make up 98 per cent cumulative variance are given in Table 25 and 26.

VAR-1, VAR-2, VAR-3, VAR-4, VAR-5, VAR-6, VAR-7, VAR-8, VAR-9, VAR-10, VAR-11, VAR-12, VAR-13, VAR-14 and VAR-15 denotes the 15 dimensions (variables) (Fig. 9).

The results indicated that the first linear combination of principal component itself contributed 60.05 per cent of variation in social sustainability. The second contributed 18.09 per cent, third contributed 8.45 per cent followed by fourth principal component 4.39 per cent, fifth 2.54 per cent, sixth 1.90 per cent, seventh 1.17 per cent contributed to the total variation. The four principle component together account for 91 per cent variation in social sustainability. It is also indicated that the rest had virtually very little in predicting the variations in social sustainability (Fig. 9).

Thus the first linear combination of dimensions yielded 60.05 per cent of total variance. In the first linear combination, larger magnitude of variation was contributed by dimension such as food security followed by housing security, human resource development, health and nutritional security, ethnodevelopment, participation, socio-political empowerment,

Table 25. Result of principal component analysis of dimensions of social sustainability

Variables/ Dimensions	Principal components									
	1	2	3	4	5	6	7	8	9	10
VAR-1	0.527	0.203	-0.692	-0.432	-0.104	-0.036	-0.018	-0.006	-0.006	-0.018
VAR-2	0.514	-0.672	0.400	-0.337	0.050	-0.035	0.054	-0.005	-0.049	-0.033
VAR-3	0.436	0.663	0.566	-0.012	-0.210	-0.041	0.006	0.003	0.006	-0.039
VAR-4	0.400	-0.168	-0.176	0.767	-0.157	-0.376	0.000	0.028	-0.106	0.051
VAR-9	0.165	-0.019	-0.001	0.141	0.193	0.412	-0.740	0.380	0.063	-0.066
VAR-5	0.165	-0.023	-0.025	0.195	0.062	0.428	-0.083	-0.806	0.190	0.017
VAR-10	0.159	0.024	-0.064	0.208	0.137	0.618	0.609	0.315	-0.166	-0.151
VAR-7	0.132	0.183	0.009	0.027	0.923	-0.285	0.071	-0.064	0.005	0.014
VAR-6	0.075	-0.035	-0.048	0.080	-0.025	0.048	-0.058	0.079	0.063	0.042
VAR-11	0.055	-0.037	0.002	0.043	-0.023	-0.084	0.191	0.248	0.865	0.064
VAR-13	0.045	-0.007	-0.007	-0.016	0.035	0.123	0.100	-0.002	0.084	0.755
VAR-14	0.013	0.028	0.022	-0.011	-0.022	0.096	-0.064	0.096	0.058	0.359
VAR-12	0.012	0.017	0.035	-0.010	-0.005	0.059	-0.029	-0.030	-0.105	0.389
VAR-8	0.009	0.016	0.025	-0.012	0.044	-0.026	-0.078	0.157	-0.235	0.263
VAR-15	0.004	0.019	0.009	-0.024	-0.035	-0.031	0.072	0.022	-0.299	0.202

VAR-1 Food security
VAR-2 Housing security
VAR-3 Human resource development
VAR-4 Health and nutritional security
VAR-5 Ethno-development
VAR-6 Participation
VAR-7 Socio-political empowerment
VAR-8 Strengthening hamlet system
VAR-9 Protection of cultural heritage
VAR-10 Human right security
VAR-11 Institution building
VAR-12 Infrastructure development
VAR-13 Right to information
VAR-14 Promotion of moral values
VAR-15 Development facilitatory linkage

Table 26. Percentage of variance and cumulative variance contributed by dimensions of social sustainability

Principal components	Latent roots	Percentage variance	Cumulative variance
1	10127.957	60.055	60.055
2	3052.230	18.098	78.153
3	1426.196	8.457	86.610
4	741.852	4.399	91.009
5	428.768	2.542	93.551
6	321.429	1.906	95.457
7	193.065	1.145	96.602
8	145.748	0.864	97.466
9	87.562	0.519	97.985
10	75.439	0.447	98.433

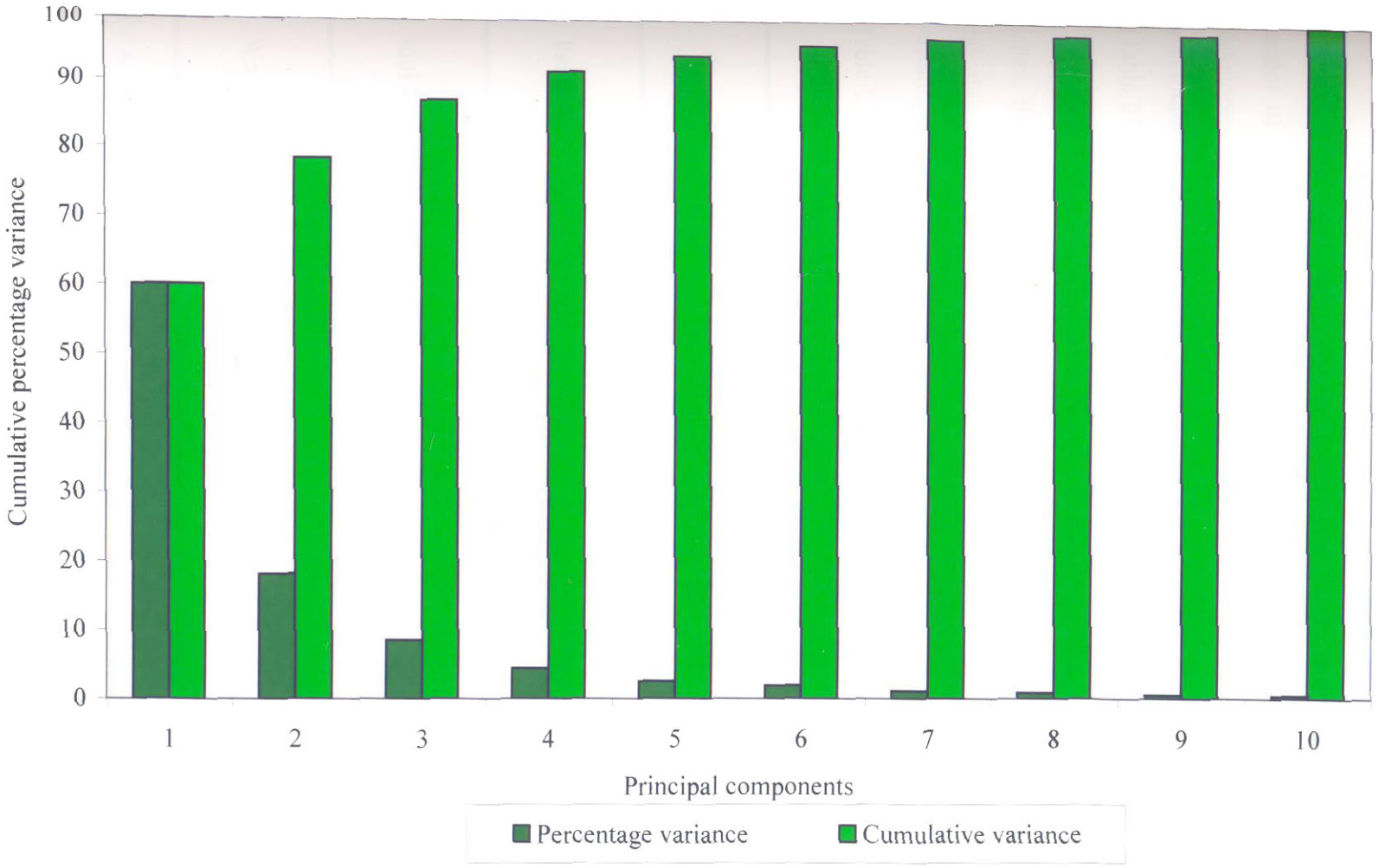


Fig. 9. Percentage variance and cumulative variance of dimensions of social sustainability under principal components

strengthening hamlet system, protection of cultural heritage and human right security (Table 26).

4.2.7 Development of Ecological Sustainability Index Value (EcSIV)

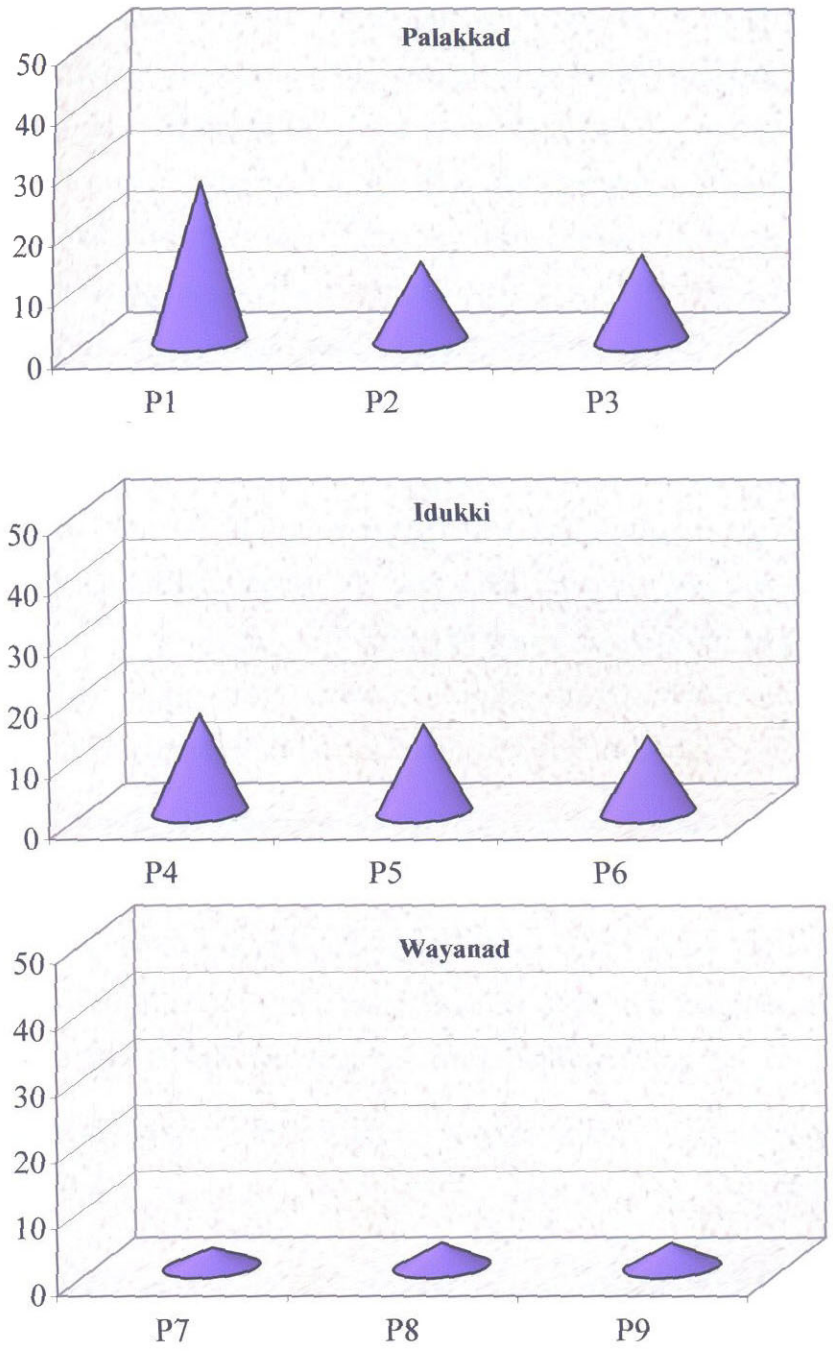
Ecological sustainability index was used as a tool to assess the extent of ecological sustainability of tribal society accrued out of tribal development programmes. The three dimensions of ecological sustainability constitute for Ecological Sustainability Index (EcSIV) (Table 27 and Fig. 10).

Based on the score obtained by applying ecological sustainability index, the EcSIV of respondents of nine panchayats in three districts were calculated. The procedure adopted in the development of ecological sustainability index was described in methodology chapter.

Table 27. Comparison of average Ecological Sustainability Index Value – district and panchayat wise (N = 200)

Districts	Average ESIV of district	ESIV of panchayats			CD (Panchayats)
		P_1	P_2	P_3	
Palakkad	17.76	26.19	12.94	14.16	P_1-P_2 = 6.18 P_1-P_3 = 5.34 P_2-P_3 = 7.40
Idukki	14.35	P_4	P_5	P_6	P_4-P_5 = 4.06 P_4-P_6 = 4.22 P_5-P_6 = 4.06
		16.18	14.38	12.50	
Wayanad	7.72	P_7	P_8	P_9	P_7-P_8 = 2.87 P_7-P_9 = 3.56 P_8-P_9 = 3.57
		2.87	3.56	3.57	

P_1 Agali P_2 Muthalamada P_3 Perumatti
P_4 Kanthalloor P_5 Velliyamattom P_6 Arakkulam
P_7 Kaniyampetta P_8 Noolpuzha P_9 Thirunelli



P_1 – Agali
P_2 – Muthalamaad
P_3 – Perumatti
P_4 – Kanthalloor
P_5 – Velliyamattam
P_6 – Arakkulam
P_7 – Thirunelli
P_8 – Kaniyampetta
P_9 – Noolpuzha

Fig. 10. Average ecological sustainability index value - panchayats wise

The results presented in Table 27 and Fig. 10 indicates that the panchayat wise and district wise distribution of EcSIV of tribal respondents. The results in the table reveals that Palakkad district had the highest ecological sustainability index value (17.76) followed by Idukki (14.35) and Wayanad district (7.72). This may be due to the reason that some sort of land resources are conserved and ecosystem is preserved by some development agencies like Attappadi Hill Area Development Society (AHADS). It is also noted that critical difference of the ecological sustainability exists between three panchayats.

No much critical difference in ecological sustainability exists between panchayats in other two districts of Idukki and Wayanad. Ecological sustainability index of the tribal respondents in Wayanad district is very poor. This may be due to the less awareness of tribes due to poor educational status and external interferences, deforestation and improper way of implementing government programmes etc.

4.2.8 Correlations of Dimensions of Ecological Sustainability with Ecological Sustainability Index Value

The degree of linear relationship of three dimensions of ecological sustainability with EcSIV was found out by Pearson Product Moment Correlation Coefficient (r). The result is presented in Table 28.

Table 28. Correlation of dimensions of ecological sustainability with EcSIV N = 200

Dimensions	Mean	Variance	Correlation coefficient (r)
Resource conservation	0.72	0.53	0.43**
Ecosystem preservation	0.89	0.64	0.80**
Indigenous knowledge system	0.82	0.55	0.77**

The perusal of data presented in Table 28 indicates, the relationship of dimensions of ecological sustainability with EcSIV. The test for statistical significance for correlation coefficient ® was made at 0.05 and 0.01 level of probability. The results indicates that all the three dimensions had significant and positive relationship with EcSIV at 0.01 level.

The high correlation coefficient in the present study clearly reveals that the dimensions included in the study were not extraneous but rather form the part of EcSIV. The positive and significant correlation of all components to EcSIV justified the important assumption that dimensions included in the EcSIV have significant association with ecological sustainability.

4.2.9 Principal Component Analysis of Ecological Sustainability

The results of the principal component based on three dimensions (variables) of ecological sustainability are presented in Table 29 and 30. For these three dimensions, there will be three vectors. VAR-1, VAR-2 and VAR-3 denotes three dimensions (Fig. 11).

Table 29. Result of principal component analysis of dimensions of ecological sustainability

Variables/ Dimensions	Principal components		
	1	2	3
VAR-2	0.760	-0.335	-0.557
VAR-1	0.591	0.002	0.807
VAR-3	0.269	0.942	-0.199

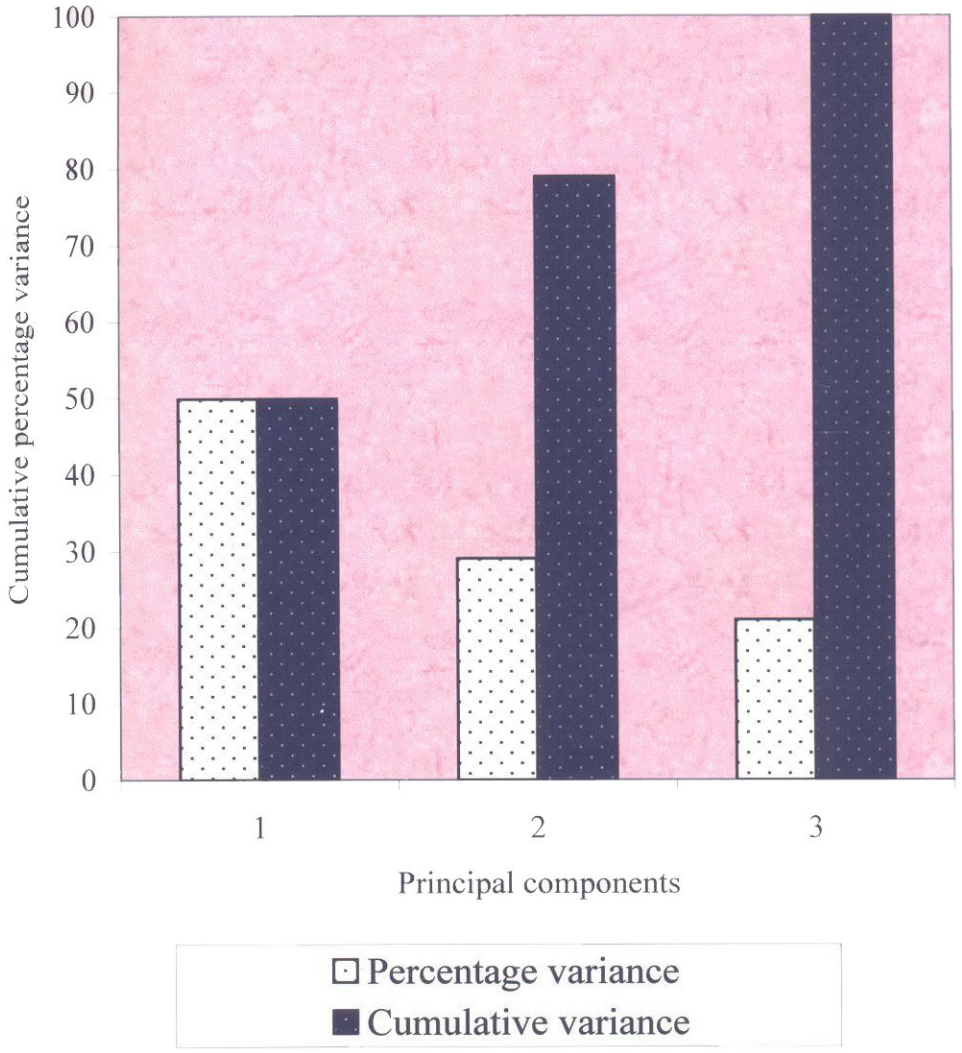


Fig. 11. Percentage of variance and cumulative variance contributed by dimensions of ecological sustainability under principal component analysis

Table 30. Percentage of variance and cumulative variance contributed by dimensions of ecological sustainability

Principal component	Latent root	Percentage variance	Cumulative variance
2	177.69	49.87	49.86
1	103.66	29.09	78.96
3	74.98	21.04	100.00

VAR – 1 : Resource conservation

VAR – 2 : Ecosystem preservation

VAR – 3 : Indigenous knowledge system

Results indicated that the first linear combination of principal component contributed 49.86 per cent to the total variation, the second linear combination contributed 29.09 per cent and third linear combination of principal component contributed 21.04 per cent to the total variation. Thus the first linear combination of dimensions yielded 49.86 per cent of total variation. In the first linear combination, larger magnitude of variation was contributed by dimensions *viz.*, ecosystem preservation (VAR-2) followed by resource conservation (VAR-1) and indigenous knowledge system (VAR-3).

The above findings indicate that the dimensions ecosystem preservation and resource conservation contributed higher magnitude of variation. The results of correlation of dimension with ecological sustainability index value conforms the above findings.

4.3 SUSTAINABLE TRIBAL DEVELOPMENT INDEX VALUE OF NINE PANCHAYATS IN THREE DISTRICTS

Sustainable Tribal Development Index (STDI) values were used as a tool to assess the extent of sustainable development of tribals accrued out of tribal development programmes so far implemented. The three

subdimensions of economic, social and ecological sustainability constitute to form the STDI values (Table 31 and Fig. 12).

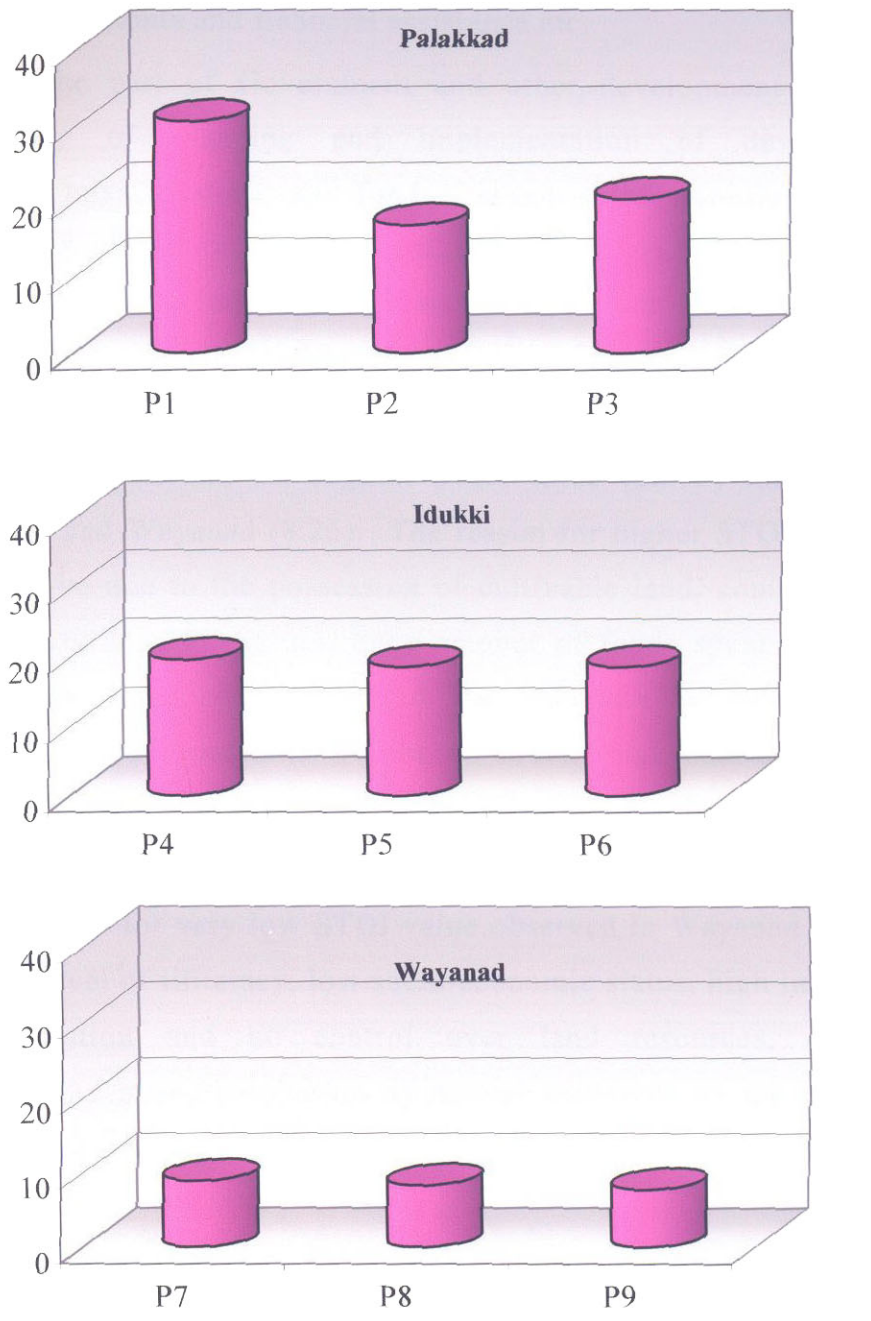
The procedure adopted in the development of STDI value was described in Methodology chapter. Based on the score obtained by applying the Sustainable Tribal Development Index, the STDI values of respondents of nine panchayats in three districts were calculated.

Table 31 Average Sustainable Tribal Development Index Values – district and panchayat wise

Districts	Average STDI values of district	STDI values of panchayats			CD (Panchayats)
		P_1	P_2	P_3	
Palakkad	22.56	30.52	16.86	20.30	P_1-P_2 = 2.63 P_1-P_3 = 2.27 P_2-P_3 = 3.15
		P_4	P_5	P_6	P_4-P_5 = 2.51
Idukki	18.96	19.59	18.55	18.57	P_4-P_6 = 2.61 P_5-P_6 = 2.51
		P_7	P_8	P_9	P_7-P_8 = 1.32
Wayanad	8.25	8.83	8.26	7.68	P_7-P_9 = 1.63 P_8-P_9 = 1.64

P_1 Agali P_2 Muthalamada P_3 Perumatti
P_4 Kanthalloor P_5 Velliyamattom P_6 Arakkulam
P_7 Kaniyampetta P_8 Noolpuzha P_9 Thirunelli

The results indicated that the range of STDI value is only between 8.25 - 22.56 observed in three districts which accounts for more than 65 per cent of tribes in Kerala reveals the pathetic situation of tribes in the development sector even after the massive expenditure of funds for tribal development for the last five decades. This may be due to many reasons like illiteracy, displacement of tribes from their traditional life supporting system through land alienation, destruction of natural resources and loss of cultural identity through external interference, violation of human



P_1 – Agali
P_2 – Muthalamaad
P_3 – Perumatti
P_4 – Kanthalloor
P_5 – Velliyamattam
P_6 – Arakkulam
P_7 – Kaniyampetta
P_8 – Noolpuzha
P_9 – Thirunell

Fig. 12. Average sustainable tribal development index value - panchayat wise

rights, vulnerability to alcohol and drugs, high dependence and orientation towards external inputs and financial assistance etc.

From the part of Government and other development agencies improper way of planning and implementation of development programmes, misutilization of funds, absence of monitoring and evaluation, lack of commitment and unfavourable attitude of government officials etc. may be the important reasons for the present situation.

The Table 31 shows the panchayat wise and district wise distribution of STDI value of tribal respondents. It could also be observed that Palakkad district had the highest STDI value (22.56) followed by Idukki (18.96) and Wayanad (8.25). The reason for higher STDI value in Palakkad may be due to the possession of cultivable land, comparatively less incidence of land alienation, huge amount of funds spent for tribal development in Attappadi Block and the influence of development agencies like AHADS and other NGOs. In Idukki high educational and socio-economic status and high social awareness may the main reasons as indicated by data presented in table.

The reasons for very low STDI value observed in Wayanad may be due to higher level of illiteracy, low socio-economic status, high incidence of land alienation and no control over land resources, cultural disintegration and over exploitation of natural resources by the external interference, less socio-political awareness, food insecurity, low ethno development etc.

Considering the pathetic situations in Wayanad Government has to consider need based, problem oriented and location specific special package schemes for tribes in Wayanad especially for Paniyans, Adiyans and primitive tribes. Providing sufficient cultivable land and land based development programmes, creating employment opportunities through micro enterprises for tribal Self Help Groups (SHGs)/ Oorukkuttoms etc may contribute for their sustainable development.

4.3.1 Correlations of Dimensions of STDI with STDI value

The degree of linear relationship of 22 dimensions under three major subdimensions of sustainable tribal development index with STDI value was found out by Pearson Product Moment Correlation Coefficient (r). The result is presented in Table 32.

Table 32. Correlation of dimensions of sustainable tribal development with STDI value

Dimensions	Mean	Variance	Correlation coefficients (r)
Economic sustainability			
Control over land resources	3.75	11.23	0.90**
Employment and income generation	0.80	0.52	0.58**
Control over minor forest produces	1.41	1.09	0.55**
Agricultural productivity optimization	3.54	6.51	0.73**
Social sustainability			
Food security	2.23	2.57	0.78**
Housing security	1.89	2.46	0.74**
Human resource development	4.55	18.69	0.51**
Health and nutritional security	5.67	18.85	0.72**
Ethno-development	1.89	2.46	0.74**
Participation	1.83	2.33	0.78**
Social and political empowerment	0.89	0.64	0.72**
Strengthening of hamlet system	0.53	0.34	0.13
Protection of cultural heritage	0.45	0.28	0.73**
Human right security	0.70	0.59	0.65**
Institution building	0.76	0.63	0.47**
Infrastructure development	6.29	21.82	0.64**
Right to information	0.75	0.47	0.45**
Promotion of moral value	0.49	0.30	0.09
Development facilitatory linkage	0.44	0.25	0.001
Ecological sustainability			
Resource conservation	0.89	0.64	0.70**
Environmental soundness	0.72	0.53	0.31**
Indigenous knowledge system	0.82	0.55	0.64**

The perusal of data presented in Table 32 indicates the relationship of dimensions of sustainable tribal development index with STDI value. Test for statistical significance for correlation coefficient (r) was made at 0.05 and 0.01 level of probability. Nineteen dimensions showed positive and significant relationship with STDI value at 0.01 level of probability. Promotion of moral value and development facilitatory linkage dimensions had no significant relationship with STDI value. Among the positively and significantly correlated dimensions, control over land resources had indicate high correlation with STDI value (r = 0.90) followed by food security (r = 0.78), participation (r = 0.78), housing security (0.74), ethnodevelopment (r = 0.74), agricultural productivity optimization (r = 0.73), protection of cultural heritage (r = 0.73) in that order.

The high correlation coefficient in the present study clearly indicate that the dimensions included in the study were not extraneous but rather form part of STDI value. The positive and significant correlation of all dimensions to sustainable tribal development index justified the important assumption that the dimensions included in the study have significant association with sustainable tribal development index perceived by the respondents.

4.4 DISTRIBUTION OF RESPONDENTS BASED ON DIMENSIONS OF SUSTAINABLE TRIBAL DEVELOPMENT INDEX VALUE

4.4.1 Distribution of Respondents based on Dimensions of Economic Sustainability Index

Distribution of respondents based on dimensions of economic sustainability index are presented in Table 33 and Fig. 13.

1. Control over land resources

Control over land resources is the most important dimension of sustainable tribal development. The table showed that in Palakkad district majority (56.4 %) of the respondents had medium control over their land resources. In Idukki 52.6 per cent had medium control over land

Table 33 District wise distribution of respondents based on dimensions of economic sustainability index (N = 200)

Dimension	Category	Score range	Palakkad (%)	Idukki (%)	Wayanad (%)
1	Low	1.0 – 3.0	43.6	43.9	70.5
	Medium	3.1 – 4.5	56.4	52.6	29.5
	High	4.6 – 8.0	-	3.5	-
2	Low	1.0 – 4.5	61.8	50.9	64.8
	Medium	4.6 – 6.0	38.2	49.1	35.20
	High	6.1 – 10.0	-	-	-
3	Low	1.0 – 2.0	57.2	36.1	65.9
	Medium	2.1 – 3.0	42.8	63.9	34.1
	High	3.1 – 6.0	-	-	-
4	Low	1.0 – 12.0	32.6	54.4	63.6
	Medium	12.1– 20.0	67.4	45.6	36.4
	High	20.1 – 30.0	-	-	-

1 – Control over land resources 2 – Employment and income generation

3 – Control over minor forest produces 4 – Agricultural productivity optimization

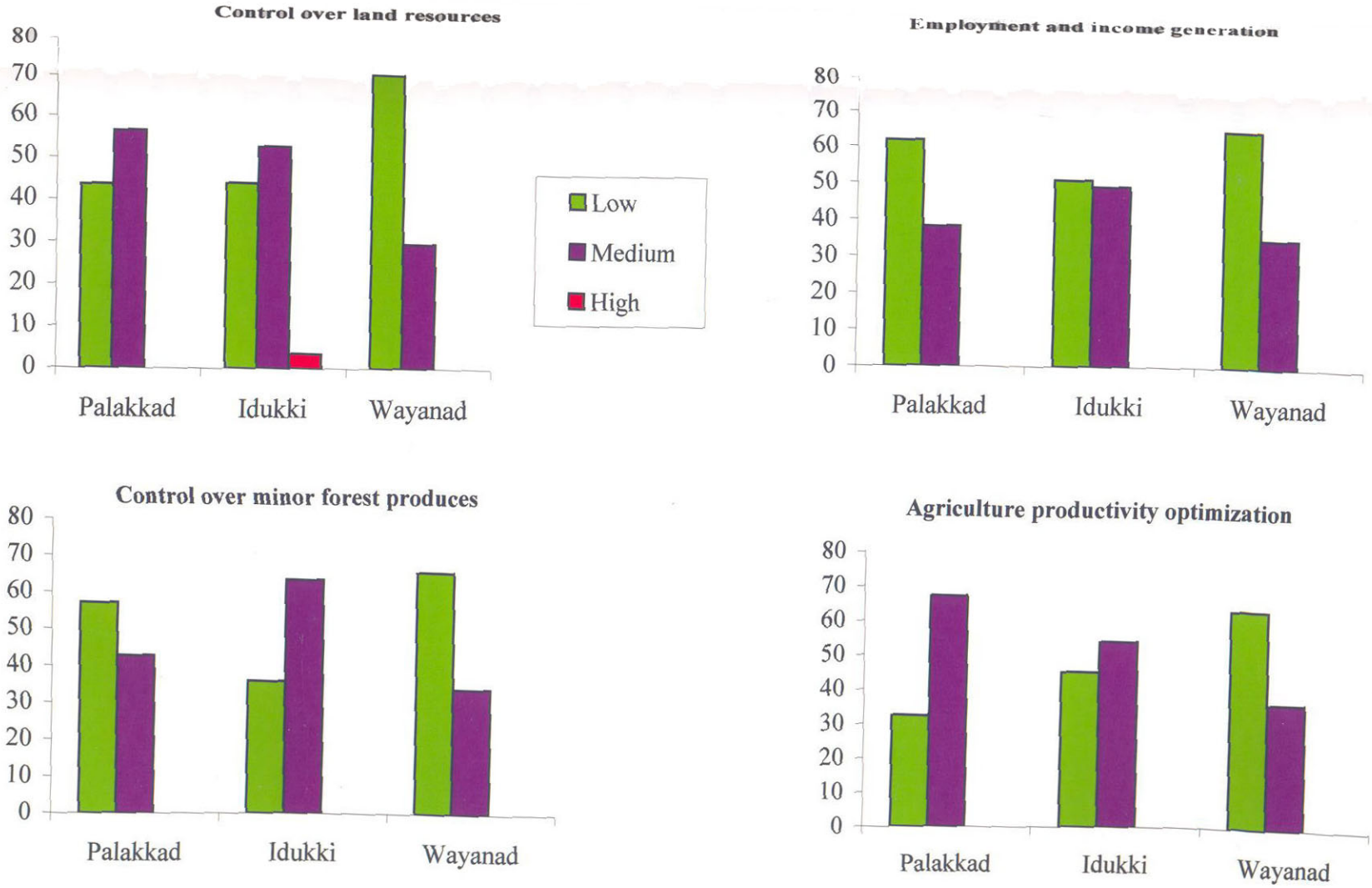


Fig. 13. Distribution of respondents based on the dimensions of economic sustainability

resources, whereas in Wayanad district 70.5 % had low control over their land resources. This may be due to the high incidence of land alienation, external interference and very low socio-educational status of the respondents as evidenced by data presented in Table 33. So the government policy should be strengthened to restore their land resources.

2. Employment and income generation

In the case of employment and income generation, majority of the group belongs to low category. The employment and income generation of the majority of tribal people in all the three districts are low especially in Wayanad district (64.8 %). Wage labour in estates available to the tribals declined as settlers also joined the labour force competing for the limited job opportunities. The subsistence living of tribals are associated with forest livelihood and no additional employment and income is generated for their sustainable living.

The tribals are living in compact areas which are generally hilly and undulating terrain. Their economy is mainly based on agriculture and forestry. However due to unauthorized alienation of tribal land and deprivation of tribals on forestry rights, their economy has been badly affected. As a result some of them have to leave their traditional habitat and their resettlement and livelihood is a question. Due to lack of entrepreneurship and necessary training, the tribals could not take advantage of the schemes of self-employment and availing the credit facilities given by the government.

3. Control over minor forest produces

In the case of minor forest produce collection, majority of the respondents in Palakkad and Wayanad are having low control and right over the minor forest produces and therein Idukki district is having medium control and right over minor forest produces. In all the three districts, Forest Department is not giving freedom and right to tribal people for collecting the minor forest produces due to the stringent forest policies and laws.

4. Agricultural productivity optimization

As far as the agricultural productivity optimization is concerned, more than half of the respondents (67.40 %) in Palakkad district belongs to medium category whereas tribes in Idukki and Wayanad districts, majority belongs to low category. In Palakkad district, especially in Attappadi block tribal people are having more cultivated land and as compared to Idukki and Wayanad and they cultivate food crops like cereals and millets. This may be the reason for high agricultural productivity in Palakkad. But in Idukki and Wayanad the incidence of high land alienation and no control over their land resources may be the reason for low agricultural productivity optimization.

4.4.2 Distribution of Respondents Based on Dimensions of Social Sustainability Index

District wise distribution of respondents based on dimensions of social sustainability index are presented in Table 34 and Fig. 14.

Food security

In Palakkad district, major distribution of tribes were observed in medium category (56.9 %). This may be due to their own farming in addition to the food support programme of government. In Idukki also majority of the respondents belonged to medium category. But in Wayanad their condition is very bad and food security is not ensured to majority of respondents (70.5 %). This may be due to the reason that majority of the tribes are agricultural labourers. Since their employment and income is very less, their purchasing power is also very less. Food Support Programme of the government is also not efficient and sufficient for ensuring food security of the tribal people.

Housing security

In the case of housing security majority of the respondents in Palakkad and Idukki belongs to medium category (51.9 and 61.4 %

Table 34 District wise distribution of respondents based on dimensions of social sustainability index (N = 200)

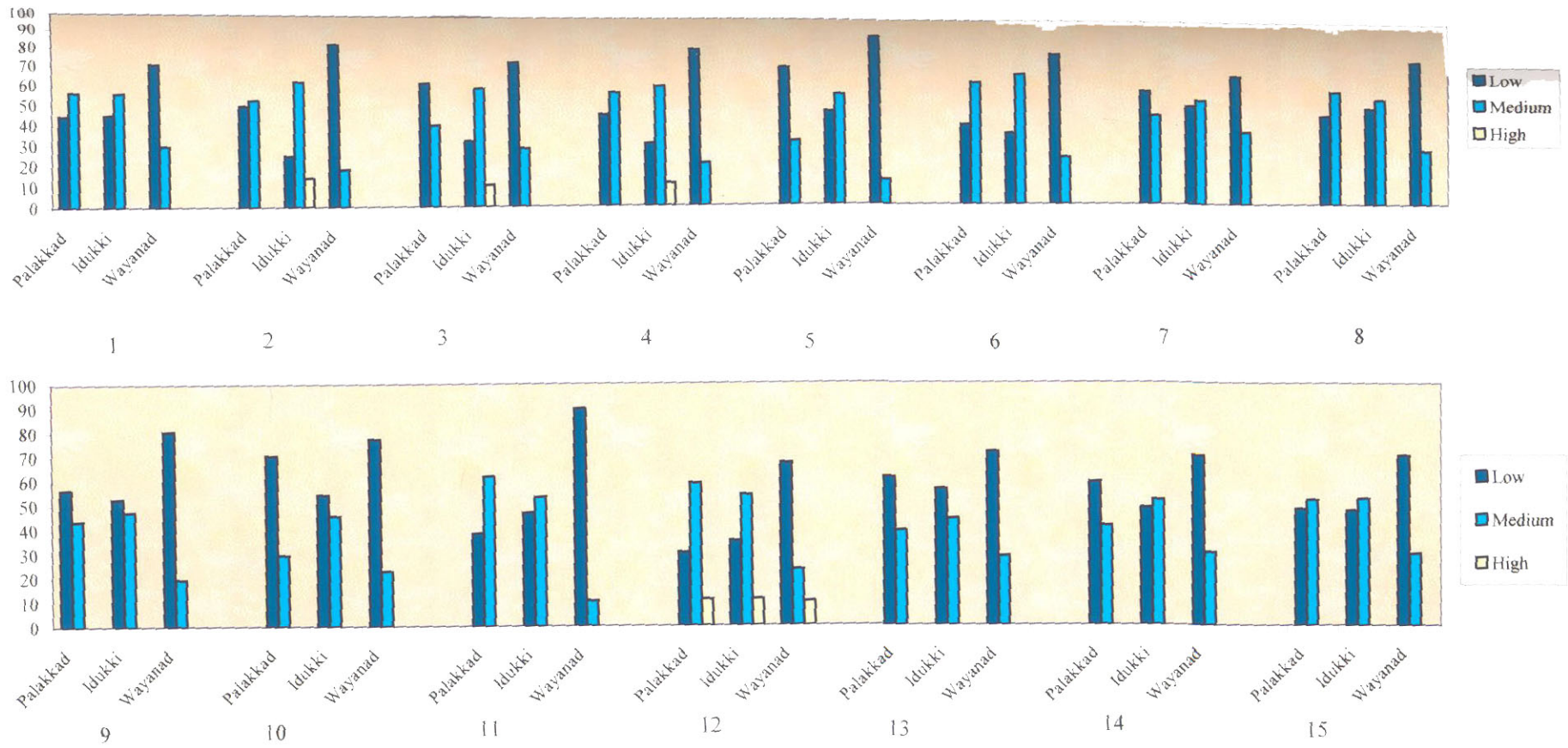
Dimension	Category	Score range	Palakkad (%)	Idukki (%)	Wayanad (%)
1	Low	1.0 – 4.0	44.1	44.5	70.5
	Medium	4.1 – 7.0	55.9	55.5	29.5
	High	7.1 – 1.2	-	-	-
2	Low	1.0 – 3.5	49.1	24.6	82.0
	Medium	3.6 – 10.5	51.9	61.4	18.0
	High	10.6 – 12.0	-	14.0	-
3	Low	1.0 – 7.0	60.5	31.6	72.0
	Medium	7.1 – 18.0	39.5	57.9	28.0
	High	18.1 – 27.0	-	10.5	-
4	Low	1.0 – 15.0	44.4	30.1	79.5
	Medium	15.1 – 25.0	55.6	58.9	20.5
	High	25.1 – 36.0	-	11.0	-
5	Low	1.0 – 6.0	69.1	45.6	88.0
	Medium	6.1 – 10.0	30.9	54.4	12.0
	High	10.1 – 12.0	-	-	-
6	Low	1.0 – 3.0	39.0	34.6	77.3
	Medium	3.1 – 5.0	61.0	65.4	22.7
	High	5.1 – 9.0	-	-	-
7	Low	1.0 – 2.0	56.4	48.5	64.8
	Medium	2.1 – 4.0	43.6	51.5	35.2
	High	4.1 – 6.0	-	-	-
8	Low	1.0 – 1.5	43.6	47.68	73.7
	Medium	1.6 – 2.0	56.4	52.32	26.3
	High	2.1 – 3.0	-		-

1– Food security, 2 – Housing security, 3 – Human resource development
4– Health and nutritional security, 5 – Ethno-development
6 – Participation, 7 – Socio-political empowerment, 8 – Strengthening hamlet system

Table 34 Continued

Dimension	Category	Score range	Palakkad	Idukki	Wayanad
9	Low	1.0-2.0	56.4	52.6	80.5
	Medium	2.1-4.0	43.6	47.4	19.5
	High	4.1-6.0	-	-	-
10	Low	1.0-2.0	70.5	54.4	77.2
	Medium	2.1-4.0	29.5	45.6	22.8
	High	4.1-6.0	-	-	-
11	Low	1.0-1.5	38.2	46.8	89.5
	Medium	1.5-2.0	61.8	53.2	10.5
	High	2.1-3.0	-	-	-
12	Low	1.0-9.0	30.3	35.0	66.9
	Medium	9.1-14	58.8	53.9	23.1
	High	14.1-21	10.9	11.1	10.0
13	Low	1.0-1.5	60.9	56.1	71.4
	Medium	1.5-2.0	39.1	43.9	28.6
	High	2.1-3.0	-	-	-
14	Low	1.0-2.0	59.0	48.4	69.8
	Medium	2.1-3.0	41.0	51.6	30.2
	High	3.1-4.0	-	-	-
15	Low	0.0-1.0	48.2	47.6	70.2
	Medium	1.1-1.5	51.8	52.4	29.8
	High	1.6-2.0	-	-	-

9 – Protection of cultural heritage, 10 – Human right security, 11 – Institution building
12 – Infrastructure development, 13 – Right to information, 14 – Promotion of moral value
15 – Development facilitatory linkage



1– Food security
2 – Housing security
3 – Human resource development
4– Health and nutritional security
5 – Ethno-development
6 – Participation
7 – Socio-political empowerment
8 – Strengthening hamlet system
9 – Protection of cultural heritage
10 – Human right security
11 – Institution building
12 – Infrastructure development
13 – Right to information
14 – Promotion of moral value
15 – Development facilitatory linkage

Fig. 14. Distribution of respondents based on the dimensions of social sustainability

respectively). This may be due to the implementation of the government programmes. But in Wayanad, low housing security is observed to the majority (82.0 %). This may be due to their low socio-economic and educational status and failure of government programmes to get priorities in the development agenda of tribes.

Human resource development

Human resource development (HRD) is low in Palakkad and Wayanad district (60.5 per cent and 72.0 %). But in Idukki district majority (57.9 %) belongs to medium category of HRD. Human resource development is considered as one of the important dimensions of development. Eventhough the Government has started many programmes for educational development, the rate of school drop out is not decreasing. Poor accessibility to educational institutions and high incidence of child labour may be the reasons for low educational status.

Health and nutritional security

In Palakkad (55.6 %) and Idukki (58.9 %) medium health and nutritional security was observed to majority of respondents. In Palakkad, huge expenditure of government fund was made for health programmes in Attappady block and in Idukki may be due to high socio-economic, educational status, social awareness and participation of respondents. Whereas in Wayanad the condition is very bad where low health and nutritional security was observed in majority of tribes (79.5 %). This may be due to their low level of literacy, less social awareness because of the low educational and socio-economic status and also due to less participation. The failure of government health programmes may be another reason. It was also noted that strict monitoring of the health programme is not at all ensured by the government in tribal areas.

Ethno-development

Low ethno-development was observed in Palakkad and Wayanad districts (69.1 and 88.0 % respectively) and majority of respondents in Idukki district (54.4 %) belonged to medium category. This may be due to their higher educational status and social awareness.

Ethno-development is the core dimension of sustainable tribal development which includes, self sufficiency, social justice, participation, decentralization and ecological equilibrium. Low ethno-development may be due to their illiteracy, low socio-economic and educational status, less social participation, high incidence of land alienation and cultural disintegration due to external interference etc.

Participation

In the case of participation majority of respondents in Palakkad (61.0 %) and Idukki (65.4 %) district belonged to medium category. In the case of Idukki district, better educational status and social awareness may be the reason for the above. People's Planning process has given more opportunity to them for participation. But in Wayanad majority of respondents belongs to low (77.3 %) category of participation. This may due to their comparatively low level of educational, socio-economic status and social awareness.

Socio-political empowerment

Majority of the respondents in Palakkad and Wayanad belonged to low category of socio-political empowerment. This may be due to the low educational status and social awareness. But in Idukki district, socio-political empowerment of tribe is little more and hence majority of respondents belongs to medium category (51.5 %). This may be due to their higher socio-educational status and awareness.

Strengthening of hamlet system

In Palakkad (56.4 %) and Idukki (52.32 %) more than half of the respondents belonged to medium category. But in Wayanad most of the respondents belonged to low category (73.7 %). Because of their illiteracy, low educational and socio-economic status, land alienation and external interference they are not actively participating in the development process. This may be the reason for the findings.

Protection of cultural heritage

Cultural heritage is not protected in all the three districts of Palakkad, Wayanad and Idukki where majority of respondents belonged to low category. This may be due to the external interference of settlers, money lenders, development agencies etc. It is a fact that the sustainability of tribal development can be achieved only based on their culture, values and traditional life supporting system.

Human right security

Human right security is not at all protected in all the three districts. This may be due to many reasons like attitude of government and non-tribal community towards tribes. Their socio-economic and educational backwardness is exploited by others and their interest is not protected by the government even though the constitutional and legal measures are there.

Institution building

Majority of the respondents in Palakkad (61.8 %) and in Idukki (53.2 %) opined that institution building is medium. In Palakkad, this may be due to the high expenditure of government funds in Attappady block for tribal development programmes. But in Wayanad the opinion of 89.5 per cent is that the institution building is low even though tribal development programmes are being implemented since 1975.

Infrastructure development

In the case of infrastructure development, 58.8 per cent of respondents in Palakkad and 53.9 per cent in Idukki district were of the opinion that infrastructure development is medium whereas in Wayanad three fourth majority rated it as low. All infrastructural facilities were very less in majority of tribal hamlets. Inspite of massive expenditure of tribal funds, majority of tribal families are not yet receiving minimum requirements like drinking water, housing, electric connection, sanitation, etc.

Right to information

Right to information is one of the important dimensions of sustainable tribal development and it is seen that majority of the respondents in Palakkad, Idukki and Wayanad districts belonged to low category (69.9 %, 56.1 % and 71.4 % respectively). This may be due to the failure of the government machinery in disseminating right information to the tribes in right time.

Promotion of moral value

Promotion of moral value is very low among the tribe in Palakkad and Wayanad districts. Their low educational status and social awareness may be the reason for this. But due to the better educational status and social awareness promotion of moral value is medium in Idukki district.

Development facilitatory linkage

Majority of respondents belongs to medium category of development facilitatory linkage in Palakkad and Idukki districts (51.8 and 52.4 % respectively) and in Wayanad it is low (70.2 %). Development facilitatory linkage is also one of the important dimensions of sustainable tribal development to facilitate development process between tribes and non-tribes.

4.4.3 Distribution of Respondents Based on Dimensions of Ecological Sustainability Index

Table 35 District wise distribution of respondents based on dimensions of ecological sustainability index (N = 200)

Dimension	Category	Score range	Palakkad	Idukki	Wayanad
1	Low	1.0-2.0	45.5	49.1	61.1
	Medium	2.1-4.0	54.5	50.9	38.9
	High	4.1-6.0	-	-	-
2	Low	1.0-2.0	45.5	48.9	72.0
	Medium	2.1-4.0	54.5	51.1	28.0
	High	4.1-6.0	-	-	-
3	Low	1.0-1.5	46.5	49.5	75.7
	Medium	1.5-2.0	53.5	50.5	24.3
	High	2.1-3.0	-	-	-

1 – Resource conservation 2 – Ecosystem preservation 3 – Indigenous knowledge system

District wise distribution of respondents based on dimensions of ecological sustainability index are presented in Table 35 and Fig. 15.

Resource conversion

Table 35 shows that resource conservation is medium among the majority of respondents in Palakkad (54.5 %) and Idukki (50.9). But in Wayanad most of the respondents (61.1 %) belonged to low category. This may be due to the high incidence of external interference and less social awareness. The sustainable tribal development can be intensified through judicious use of available natural resources and congruence with local needs and values.

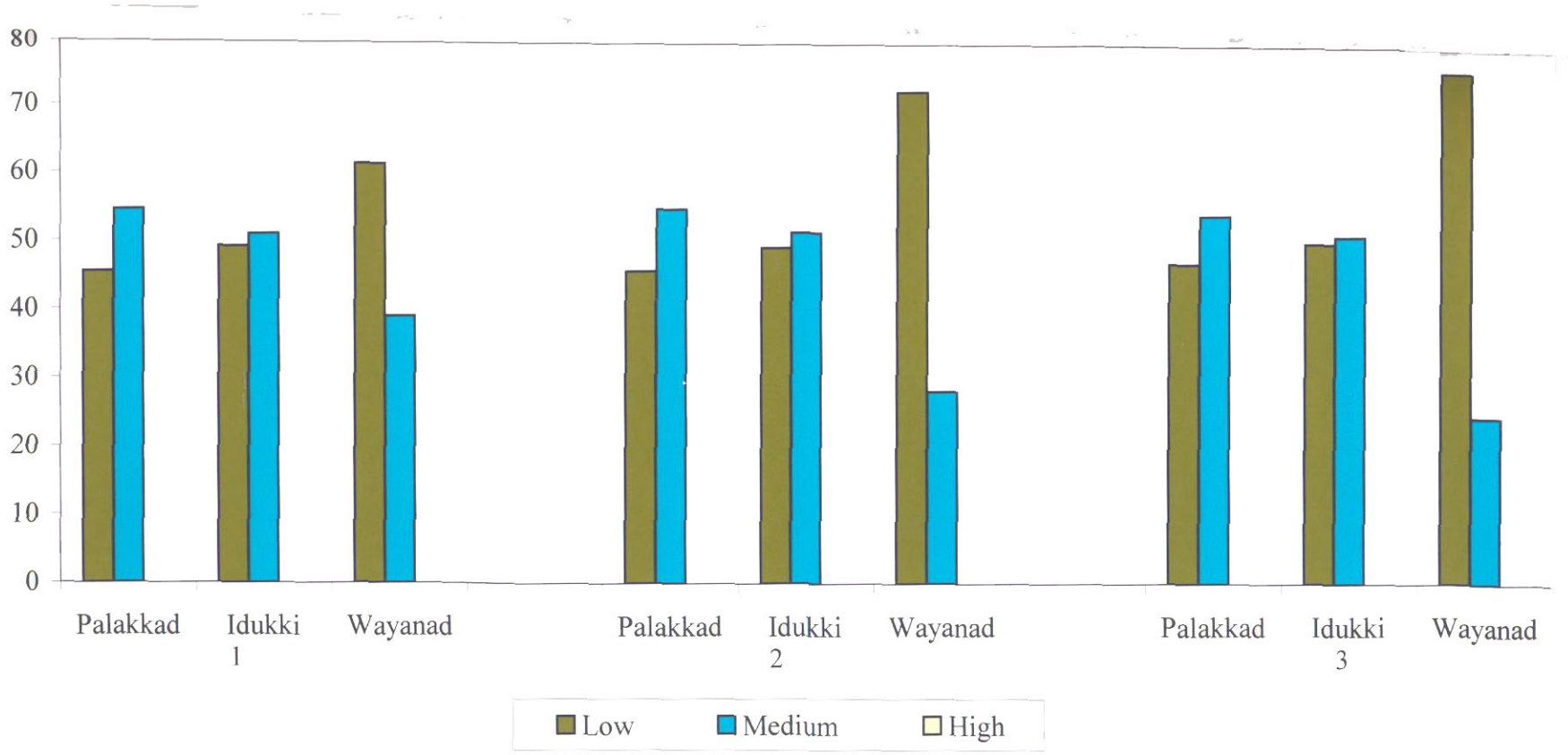


Fig. 15. Distribution of respondents based on dimensions of ecological sustainability index

Ecosystem preservation

Table 35 revealed that ecosystem preservation is medium among majority of respondents in Palakkad (54.5 %) and Idukki (51.1 %) districts. Whereas in Wayanad it is low (72.0 %). This may be due to the external interference and implementation of development programmes without considering their ecosystem in which they live.

Indigenous knowledge system

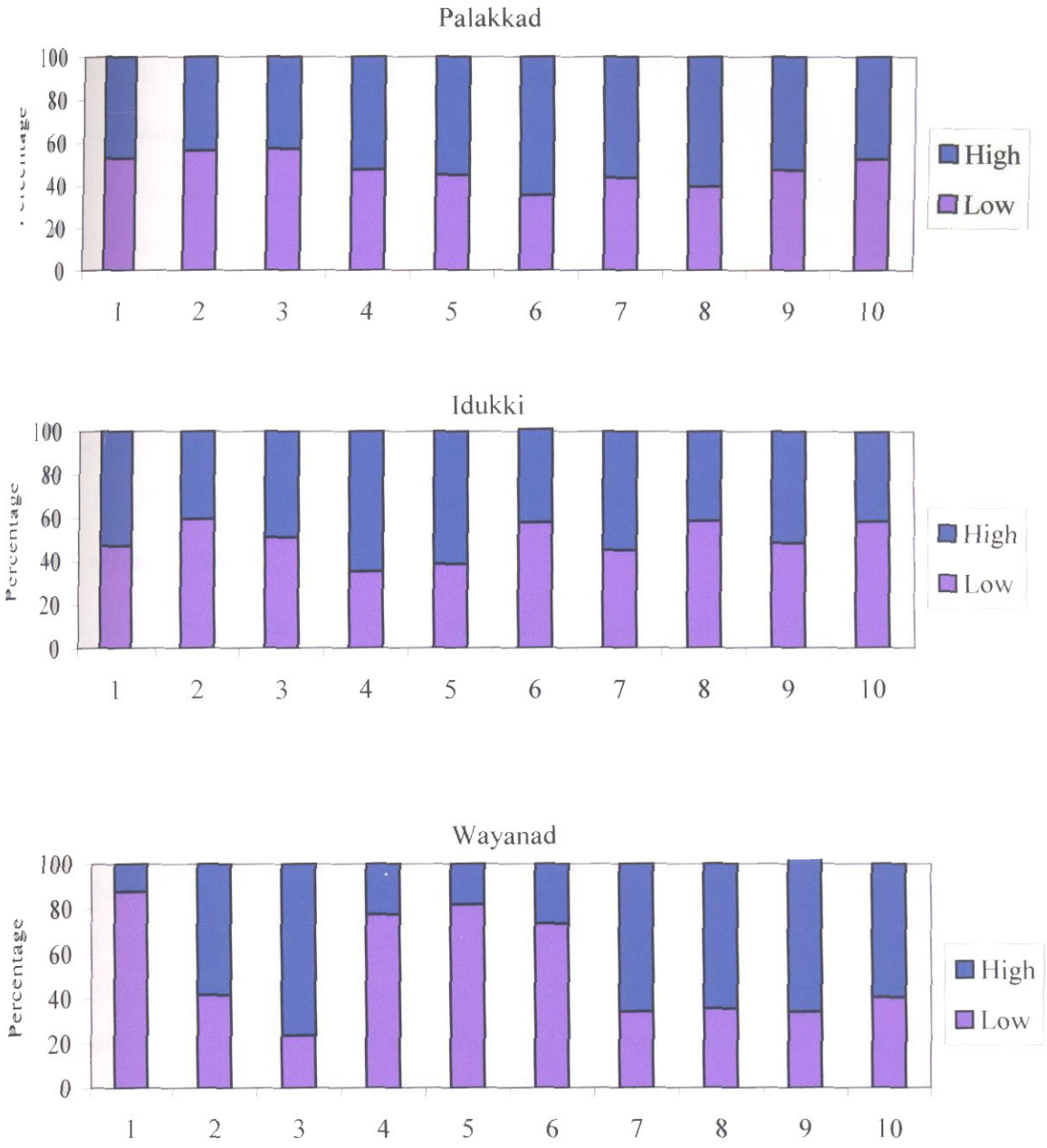
The data presented in Table 35 shows that utilization of indigenous knowledge system is medium in Palakkad district (53.5 %) and Idukki (50.5 %) and low in Wayanad (75.7 %) districts. The possession of cultivable land and connected resources of the tribes may be one of the reasons for the findings in Idukki and Palakkad.

4.5 DISTRIBUTION OF RESPONDENTS BASED ON THE FACTORS INFLUENCING SUSTAINABLE TRIBAL DEVELOPMENT INDEX

Table 36 Distribution of respondents based on the factors influencing sustainable tribal development index

Factors	Mean score	Palakkad (%)		Idukki (%)		Wayanad (%)	
		Low	High	Low	High	Low	High
Socio-economic status	17.09	52.70	47.30	46.90	53.10	87.50	12.50
Land alienation	3.09	56.40	43.60	59.50	40.50	41.70	58.30
Indebtedness	3.19	57.10	42.90	50.90	49.10	23.60	76.40
Level of aspiration	2.85	47.50	52.50	35.10	64.90	77.30	22.70
Economic motivation	7.57	45.00	55.00	38.60	61.40	81.70	18.30
Guidance and supervision	0.93	35.50	64.50	57.90	43.10	73.20	26.80
Orientation towards incentives	9.43	43.60	56.40	45.00	55.00	34.16	65.84
External interference	16.60	39.65	60.35	58.50	41.50	35.40	64.60
Political interference	2.87	47.30	52.70	48.25	51.75	34.00	76.00
Value orientation	16.57	52.50	47.50	58.40	41.60	40.35	59.65

High = > Mean Low = < Mean



1. Socio-economic status
2. Land alienation
3. Indebtedness
4. Level of aspiration
5. Economic motivation
6. Guidance and supervision
7. Orientation towards incentives
8. External interference
9. Political determinism
10. Value orientation

Fig. 16. Distribution of respondents based on the factors influencing sustainable tribal development index

Table 36 reveals the distribution of respondents based on factors influencing the sustainable tribal development index (Fig. 16).

Socio-economic status

As revealed by the data presented in Table 36, socio-economic status is low among majority of the respondents in Palakkad (52.70 %) and Wayanad (87.50 %) districts. But in Idukki it is high (53.10 %). In Wayanad, majority of the tribes have no land for cultivation, continuous unemployment, low educational status etc. may be the reason for the low socio-economic status. But in Idukki higher educational status and better social participation may be the reason for higher socio-economic status.

Land alienation

Land alienation is comparatively low in Palakkad (56.40 %) and Idukki (59.50 %) districts but high in Wayanad district (58.30 %). Low socio-economic, educational status and high incidence of external interference due to settlers, forest dwellers etc. may be the reasons for findings in Wayanad.

Ministry of Environment and Forest (1992) reported that approximately half of the area held by the tribals prior to the in-migration of the settlers had been alienated in different ways. It was striking to note that more than nine tenth of the area of land transferred had gone to the settlers alone through cash sales, mortgages and illegal encroachment.

Indebtedness

Majority of the respondents in Palakkad (57.10 %) and Idukki (50.90 %) belonged to low category of indebtedness. While in Wayanad indebtedness was seen to be high (76.40 %). This may be because of the low socio-economic status, high level of land alienation, exploitation of tribals by settlers, money lenders and other intruders.

Level of aspiration

Level of aspiration was found to be high among 52.5 per cent and 64.9 per cent of tribes in Palakkad and Idukki districts respectively. This may be due to their comparatively better socio-economic status and mingling with mainstream, exposure to media and education etc. But in Wayanad, level of aspiration observed to be low among 77.30 per cent. The reasons stated under the factors above holds good here also.

Economic motivation

The data revealed that economic motivation among the tribes is comparatively higher in Palakkad (55.00 %) and Idukki (61.40 %) districts but low in Wayanad district (81.70 %).

Guidance and supervision

Guidance and supervisions from the implementing agency of tribal development programmes is high in Palakkad and low in Idukki and Wayanad districts. It was seen that a huge amount of funds have been spent for tribal development in Agali panchayats in Attappadi block under the Integrated Tribal Development Project (ITDP), Local Self Governments and many other Non-governmental Organizations. The cumulative effect of these interventions may be the reason for more respondents observed in the high category for guidance and supervision in Palakkad district.

Orientation towards incentives

In the case of orientation towards incentives majority of tribes in three districts belong to high category. Most of the living amenities are provided by the government and other agencies to the tribal people free of cost for the past many years which made them more dependent towards incentives. The persisting dependency attitude of tribals is evident from the fact that majority of them still expect financial support and subsidized assistance from the government for improving their living conditions.

External interference

The table reveals that external interference is high in Palakkad (60.35 %) and Wayanad district (64.60 %) and low in Idukki district (58.50 %). High external interference may be due to their low socio-economic and educational status, influence of settlers, forest dwellers, middlemen and official agencies.

Political interference

Majority of the respondents in all the three districts opined that political interference is high which made many problems with their development process.

Value orientation

Value orientation is low among the majority of tribes in Palakkad (52.50 %) and Idukki (58.40 %) districts but high in Wayanad district (59.65 %). High value orientation may be due to their low educational status and social awareness.

4.5.1 Correlation of Factors influencing Sustainable Tribal Development with Sustainable Tribal Development Index Value

4.5.1.1 Correlation of Factors with Economic Sustainability

A glance at Table 37 reveals that a positive and significant relationship exist between economic sustainability and all factors except land alienation, indebtedness, orientation towards incentives, external interference and value orientation. All factors correlated with economic sustainability at one per cent level of significance except political interference which showed a negatively correlated non-significant relationship with economic sustainability.

4.5.1.2 Correlation of Factors with Social Sustainability

As per the results presented in Table 37, socio-economic status, level of aspiration economic motivation, guidance and supervision

Table 37. Correlation of factors with three sub-dimensions of Sustainable Tribal Development and Sustainable Tribal Development index (STDI)

Sl. No.	Factors	Economic sustainability index	Social sustainability index	Ecological sustainability index	Sustainable tribal development index
1	Socio-economic status	0.82**	0.46**	0.68**	0.72**
2	Land alienation	-0.40**	-0.30**	-0.38**	-0.36**
3	Indebtedness	-0.55**	-0.36**	0.51**	-0.39**
4	Level of aspiration	0.43**	0.30**	0.43**	0.34**
5	Economic motivation	0.25**	0.54**	0.07^{NS}	0.44**
6	Guidance and supervision	0.73**	0.45**	0.68**	0.57**
7	Orientation towards incentives	-0.23**	-0.23**	0.32**	-0.42**
8	External interference	-0.55**	-0.43**	0.62**	-0.44**
9	Political interference	-0.13^{NS}	0.18^{NS}	0.001^{NS}	0.16^{NS}
10	Value orientation	-0.042**	-0.37**	0.54**	-0.34**

**Significant at 1 per cent level, NS – Not significant

indicated a positive and significant relationship with social sustainability whereas the factors *viz.*, land alienation, indebtedness, orientation towards incentives, external interference and value orientation showed a negatively correlated relationship with social sustainability. Political interference is the only factor which indicated a non-significant relationship with social sustainability.

4.5.1.3 Correlation of Factors with Ecological Sustainability

A glance at Table 37 also revealed that a positive and significant relationship exist between ecological sustainability and all factors except land alienation which showed a negatively correlated relationship with ecological sustainability. Here also political interference showed a non-significant relationship with ecological sustainability.

4.5.1.4 Correlation of Factors with Sustainable Tribal Development Index

From the results of correlation analysis presented in Table 37, it could be seen that all factors except land alienation, indebtedness, orientation towards incentives, external interference and value orientation were positively and significantly related to the sustainable tribal development. But political interference is the only factor which showed a non-significant relationship with sustainable tribal development. All factors were correlated with sustainable tribal development at one per cent level of significance except political interference.

Socio-economic status

Positive and significant relationship between socio-economic status and sustainable tribal development implies that as socio-economic status increases one's socio-economic development also increases. The constituents of socio-economic status *viz.*, education, land holdings, occupation and social participation of the tribes might have helped them to obtain knowledge about the development programmes of the government and other agencies and they will grasp new ideas faster and take positive

decisions. Moreover, educated tribes come into contact with various organizations and agencies in order to acquire more informations about modern living practices and development programmes.

All these might have contributed to the positive and significant relationship of socio-economic status with sustainable tribal development index. The results of the study are in conformity with those reported by Prakash (1980).

Land alienation

Land alienation shows a negative and significant relationship with sustainable tribal development. This relationship is very factual and it implies so many things related with sustainable development. Land is sometimes linked with the perpetuation of groups of tribal people with their autonomy, solidarity and cohesion. The problem of land alienation among the tribal people is not only related to economic development but also to the social political and moral system of the state. Though majority of the tribes were agriculturists, the alienation of land in most cases reduced them to the status of landless labourers.

Indebtedness

Negative and significant relationship between sustainable tribal development and indebtedness points out many factors. Most of the tribes are indebted to landlords and moneylenders. For getting money to meet their domestic consumption, to met their social obligations and also for purchasing agricultural inputs the tribe approaches landlords or money lenders. Most of them are forced to mortgage lands to borrow the money and trapped into high level of indebtedness. This will definitely affect their sustainable development.

The study by Mathur (1975) also revealed that the most important causes of indebtedness among the tribes of Kerala are their primitive agricultural technology, illiteracy, low wages, absence of marketing

infrastructure and their social and religious obligations. The study also revealed that their agricultural loans were mostly used for consumption purpose by majority of the tribes.

Level of aspiration

The positive and significant relation between level of aspiration and sustainable tribal development may be due to the reason that majority of the tribal people in their hamlets are quite uncertain about their future and they have only limited tendencies to set forth future goals and levels of achievements. This mental setting may adversely lead to their sustainable development.

Economic motivation

It reveals that a positive relationship exist between sustainable tribal development and motivation. A tribe seeking more monitory gain is likely to invest more money in production inputs, improving their standard of living and schooling of their children etc. which ultimately leads to their sustainable development. This may be the reason for positive and significant relationship with economic motivation and sustainable tribal development.

Guidance and supervision

It is a fact that the central and state governments are implementing tribal development programmes since five decades. Even then the benefits percolated to these communities were meagre and they are still marginalized in the society. This envisages the need for proper guidance and supervision from the part of the implementing agency to monitor and evaluate whether these programmes are sustainable or not. This may be the reason for positive and significant relationship between tribal development and guidance and supervision.

Orientation towards incentives

Since all sorts of free incentives were given to tribes and their socio-economic and educational interest being protected and promoted by the governments, the tribes have developed an orientation to incentives and dependency on government. This may be the reason for negative and significant relationship between orientation towards incentives and sustainable development.

External interference

The results also reveals that a negative and significant relation exist between sustainable tribal development and external interference. The external interference in the form of settlers and forest dwellers in tribal area destroyed the traditional live support system of tribals. This reduced the tribals to the status of casual labourers and have been constrained to buy most of their requirements from the market. Thus the traditional self reliant and non-monetised tribal economy got gradually transferred into a 'dependent' and 'monetised' economy making them highly vulnerable to the external economic and social environments. This phenomena made them to be unsustainable in their development process. This result was in agreement with the Report of Ministry of Environment and Forest (1992)

Political interference

This is the only factor which shows a non-significant relation with sustainable development. This may be due to the reason that there may not be a much political consideration and political polarization from the part of implementing agencies and tribal groups in the planning and implementation of tribal development programmes.

Value orientation

Results indicates that a negative and significant relationship exist between value orientation and sustainable tribal development. Attitude, tradition and religion made it difficult for the tribals to accept the

development process. The prevalence of rigid, traditional, social and cultural outlook made them extremely tradition bound which restrict them from sustainable development. This may be the reason for negative relationship between value orientation and sustainable development.

4.6 EXTENT OF INCLUSION OF DIMENSIONS OF SUSTAINABLE TRIBAL DEVELOPMENT INDEX IN THE SELECTED TRIBAL DEVELOPMENT PROGRAMMES:1997-2000

Based on the expenditure made under productive, service and infrastructure sectors seven major schemes implemented by the Local Self Government Institutions and Tribal Development Department were selected for the study. The strategy adopted during Ninth plan was to yearmark two third of the plan fund as grant-in-aid to Local Self Government (LSG) Institutions. Even then the benefits percolated to the tribals were meagre in proportion to the investments made. Hence, more thrust was given to the schemes implemented by the LSG institutions under People's Campaign. Food support programme was exclusively implemented by Tribal Development Department. The selected schemes are as follows.

Productive sector

Agriculture development scheme.

Service sector

Drinking water

Education

Housing

Health

Food support programme

Infrastructure sector

Infrastructure development schemes

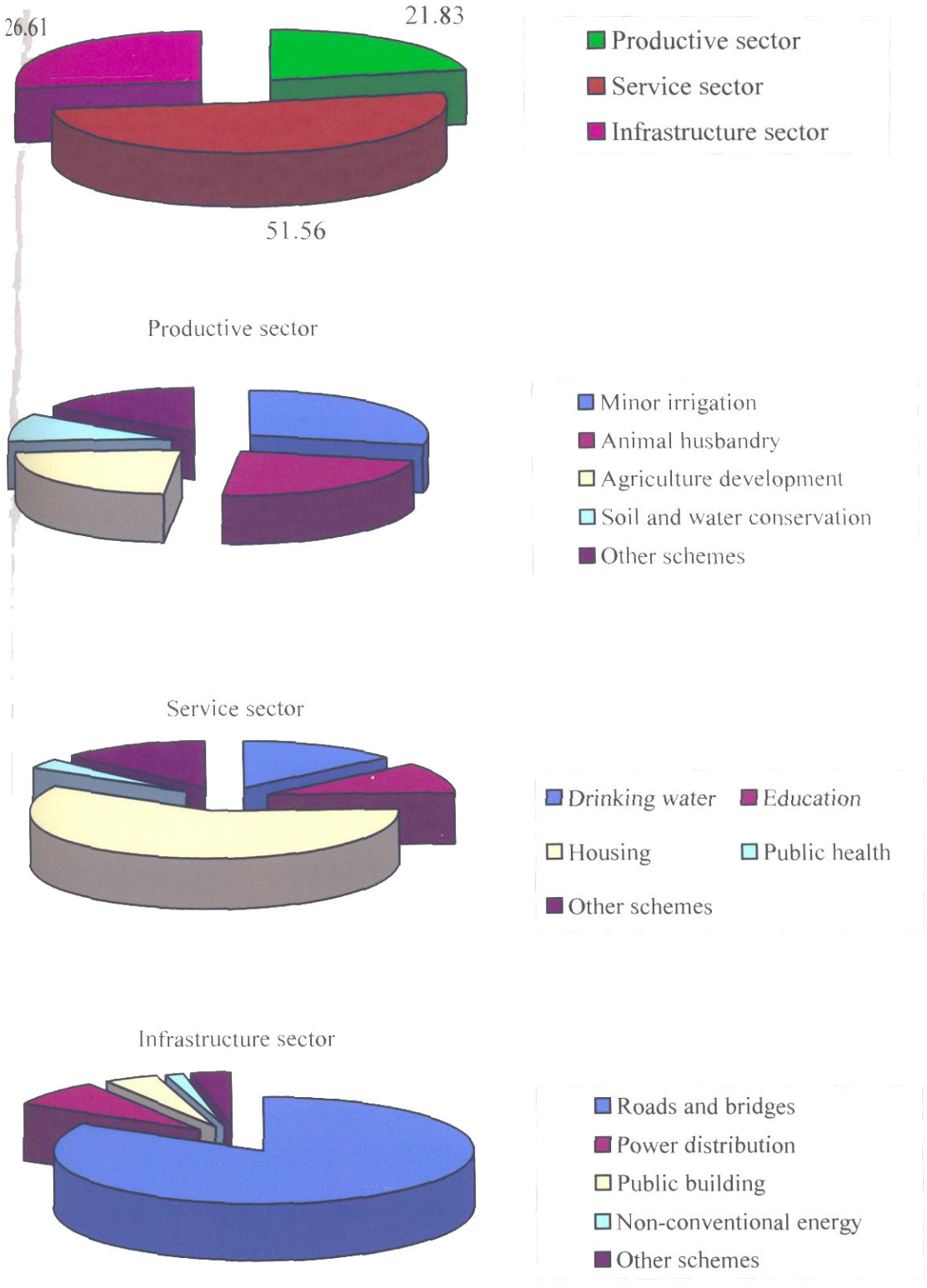


Fig. 17. Tribal Sub-Plan implemented through local self government institutions - percentage of expenditure (1997-2000)

At the Local Self Government level, the above schemes were implemented by the District Panchayat, Block Panchayat and Grama Panchayats.

Table 38 Tribal Sub-Plan through Local Self Government Institutions : percentage of expenditure

Productive sector (%)		Service sector (%)		Infrastructure sector (%)	
Minor irrigation	6.29	Drinking water	7.22	Roads and bridges	22.22
Animal husbandry	4.98	Education	5.39	Power distribution	2.10
Agriculture development	4.96	Housing	30.59	Public building	1.08
Soil and water conservation	2.35	Public health	1.73	Non-conventional energy	0.38
Other schemes	3.25	Other schemes	6.63	Other schemes	0.83
Total	**21.83**		**51.56**		**26.61**

Table 38 (Fig. 17) indicated that major part of the TSP funds have been set apart for service schemes (51.56 %) followed by infrastructure (26.61 %) and productive sectors (21.85 %). Actually productive sector has to be given more importance since it contributes to economic sustainability. Among the productive schemes, major part of funds have been set apart for minor irrigation (6.29 %), agriculture (4.98 %) and animal husbandry development (4.96 %).

Minor irrigation scheme was mainly implemented by the concerned District and Block Panchayats without any participation of tribals in its planning and implementation stage. Agriculture and animal husbandry development schemes were implemented by the concerned Grama Panchayats with active participation of the tribal people. Service sector schemes like drinking, education, housing, health and infrastructures like

roads and bridges were implemented by the three tier LSG institution – District, Block and Grama Panchayats.

4.6.1 Inclusion of Dimensions of sustainable tribal development Index in the Selected Tribal Development Programmes:1997-2000

Table 39 and Fig 18 presented below indicated the inclusion dimensions of sustainable tribal development in the selected tribal development programmes 1997-2000.

Agriculture development scheme

Results presented in Table 39 revealed that out of 22 dimensions of Sustainable Tribal Development, only 12 dimensions *viz.*, control over land resources, employment and income generation, agricultural productivity optimization, food security, participation, ethno-development, infrastructure development, right to information, development facilitatory, resource conservation, ecosystem preservation and indigenous knowledge system are directly included this schemes. Among these 12 dimensions participation has got maximum index value of 26.9 followed by agriculture productivity optimization (25.5), control over land resources (24.1) and development facilitatory linkages (23.5), Indigenous knowledge system (22.6), ecosystem preservation (20.3), resource conservation (19.6), food surety (15.9), employment and income generation (11.0), ethnodevelopment (10.3) and infrastructure development (9.0).

The scheme implemented by the panchayat under People's Campaign in association with Krishibhavan may be the reason for higher participation. Seeds, planting material, fertilizers, irrigation facilities etc. were distributed under agriculture sector. Cattle, chicks, goats etc. were distributed to tribes under Animal Husbandry scheme. But the study reveals that these schemes failed to be productive and hence less employment and income generating.

Table 39 Average tribal development programme index value of various dimensions of sustainable tribal development index under selected programmes

(N = 200)

Dimensions	Name of the selected programmes						
	Agriculture	Drinking water	Education	Housing	Health	Food support	Infrastructure development
Control over land resources	24.1	-	-	-	-	-	-
Employment and income generation	11.0	23.1	-	-	-	13.4	12.4
Control over minor forest produces	-	-	-	-	-	-	-
Agricultural productivity optimization	25.5	-	-	-	-	-	-
Food security	15.9	-	-	-	-	25.2	-
Housing security	-	-	-	16.3	-	-	-
Human resource development	-	-	26.2	-	-	-	-
Health and nutritional security	-	-	-	-	58.1	-	-
Participation	26.9	24.8	21.5	15.8	13.9	21.6	28.0
Ethno-development	10.3	11.3	10.0	0	9.1	15.2	14.1
Socio-political empowerment	-	-	-	0	-	-	-
Protection of cultural heritage	-	-	9.5	0	-	-	-
Institution building	-	-	-	-	-	-	-
Infrastructure development	9.0	6.4	-	-	-	-	30.4
Strengthening hamlet system	-	-	-	-	-	-	-
Right to information	2.6	-	-	00	-	-	-
Human right security	-	-	-	-	-	-	-
Promotion of moral values	-	-	18.3	-	-	-	-
Development facilitatory linkage	23.5	55.1	21.0	15.0	54.4	50.0	73.5
Resource conservation	19.6	23.8	23.8	-	-	-	-
Ecosystem preservation	20.3	-	-	-	-	-	18.1
Indigenous knowledge system	22.6	-	-	-	18.7	-	-

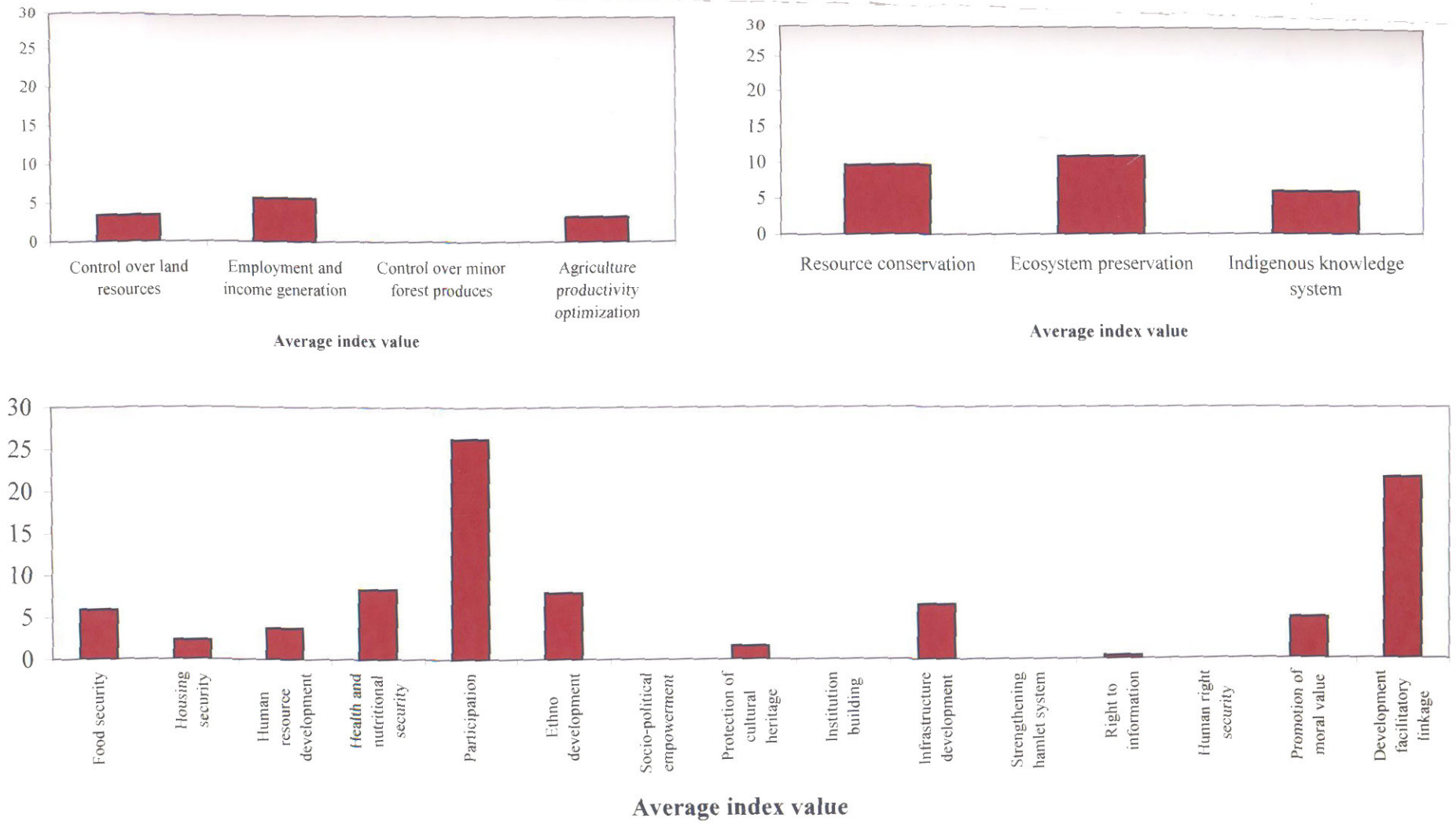


Fig. 18. Average index value of dimensions of economic, ecological and social sustainability under selected schemes

Drinking water scheme

Six dimensions like employment and income generation, participation, ethno development, infrastructure development, development facilitatory linkage and resource conservation have been included in this scheme (Table 39). Among these, development facilitatory linkage has got maximum index value (55.1) followed by participation (24.8), resource conservation (23.8), employment and income generation (23.1) and ethnodevelopment (11.3) and infrastructure development (6.4). Drinking water facilities beneficial for all communities may be the reason for high development facilitatory linkage value Other dimensions have given only negligible importance in this scheme.

Education

As per Table 39, out of 22 dimensions, seven dimensions *viz.*, human resource development, participation, ethno development, protection of cultural heritage, promotion of moral values and development facilitatory linkage have been included in this scheme. Maximum index value was observed for human resource development (26.2.9) followed by participation (21.5), development facilitatory linkage (21.0), promotion of moral value (18.3), ethno development (10.0) and protection of cultural heritage (9.5).

Though the dimensions like human resource development, right to information, infrastructure development, institution building etc. are more important as far as educational scheme is concerned, these were not seen included in the schemes for education.

Housing

Results presented in Table 39 revealed that housing security, participation and development facilitatory linkage were the dimensions included in this scheme. Housing security has got higher average index

value (16.3) followed by participation (15.8), development facilitatory linkage (15.0).

Health

A glance of Table 39 indicated that out of 22 dimensions, this scheme conforms to only five number of dimensions *viz.*, health and nutritional security, participation, developmental facilitatory linkage, ethno development and indigenous knowledge system. Maximum average index value obtained for health and nutritional security dimension was 58.1 followed by development facilitatory linkage (54.4), indigenous knowledge system (18.7, participation (13.9) and ethno development (9.1). The higher index value for the health and nutritional security may be due to the effort of non-governmental organizations and other development agencies working in this field.

Food support programme

Results in Table 39 revealed that development facilitatory linkage (50.0), food security (25.2), participation (21.6), ethno development (15.2) and employment and income generation (13.4) are the dimensions included in the scheme.

Infrastructure development scheme

As per Table 39, out of 22 dimensions, six dimensions were found to be included in this scheme. Development facilitatory linkage has got maximum index value (73.5) followed by infrastructure development (30.4), participation (28.0 ecosystem preservation (18.1), ethno development (14.1) and employment and income generation (12.4 per cent). Higher index value for the developmental facilitatory linkage may be due to the involvement of non-tribals in the planning and implementation of infrastructure development works.

Average index value for the selected schemes

To compare the various development programmes average of tribal development programme index values were worked out based on all the 22 dimensions for all schemes.

Table 40 Average index value for the selected tribal development programmes

Sl. No.	Name of Programmes	Average index value
1.	Agricultural development	10.9
2	Education	9.6
3	Health	8.5
4	Infrastructure development	8.0
5	Drinking water	6.6
6	Food support programme	5.7
7	Housing	5.6

Table 40 and Fig. 19 reveals that the average index value for the selected TSP schemes during 1997-2000. Agricultural development scheme has got higher index value (10.9) followed by education (9.6), health (8.5), infrastructure development (8.0), drinking water (6.60), food support programme (5.7) and housing (5.6). It could also be noted that the average index value for the selected schemes ranged only between 10.9 to 5.6 which indicated the poor performance of sustainability in tribal development programmes. This may be due to the non-inclusion of all possible dimensions of social, economic and ecological sustainability in development programmes intended for tribal empowerment. Among the seven schemes, higher index value of agricultural development scheme indicates that more number of possible dimensions of sustainable tribal development are included in this scheme followed by education and health etc.

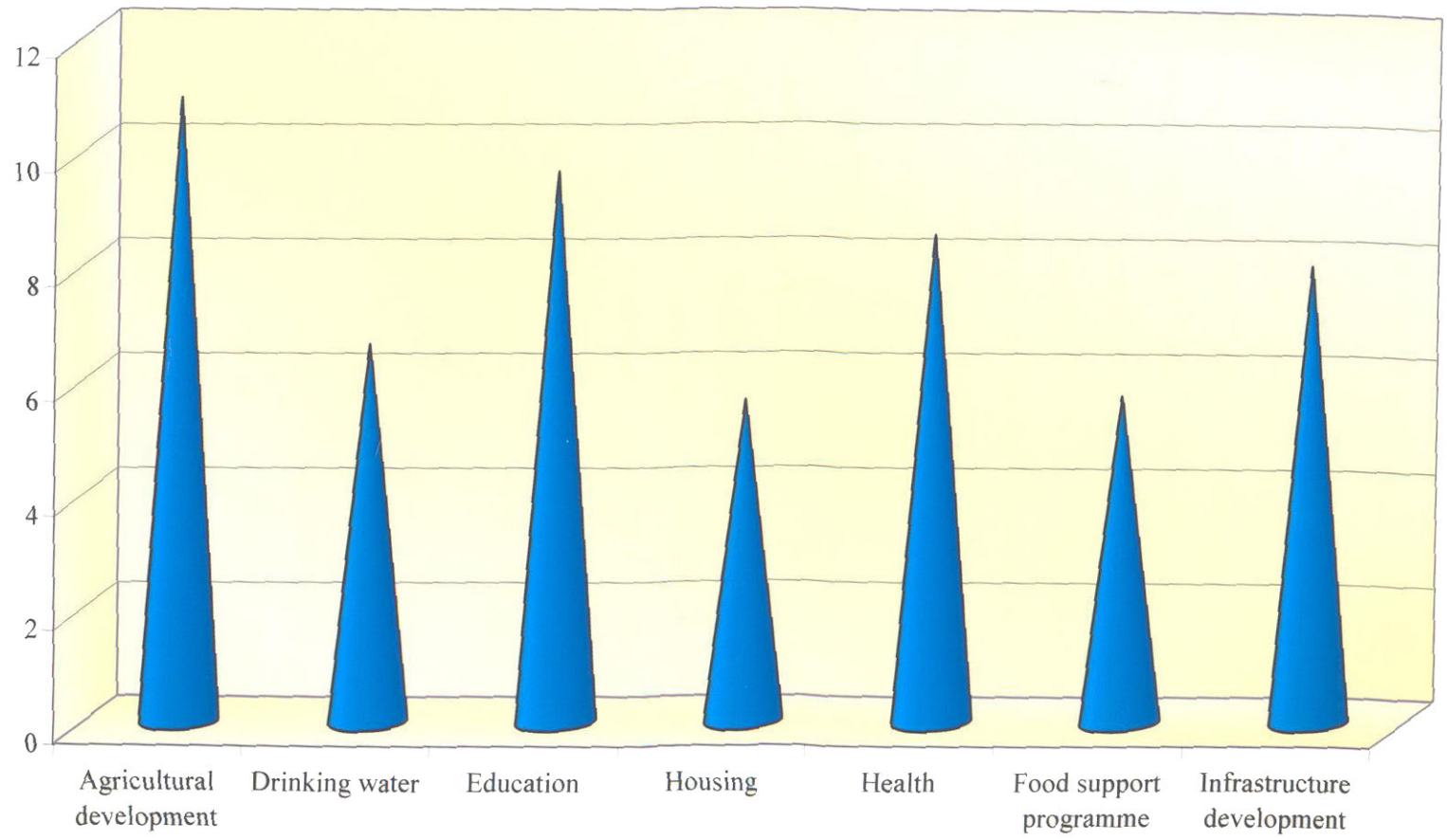


Fig. 19. Average index value for the selected schemes

Eventhough the food support, housing and drinking water etc. were important, their index value is comparatively low.

4.7 STRATEGY FOR SUSTAINABLE TRIBAL DEVELOPMENT IN KERALA

The tribal development planned and implemented during the past decades in the state was based on the top down approach of Tribal Development Department and other Development Departments. The resource poor small, marginal and landless tribes who constitute majority of the tribes were still in the corner of development agenda. To overcome the mismatch of conventional top down approach in tribal development, the best alternative is to reverse the approach to bottom up process through promoting participatory sustainable development process by putting tribes first in the continuum.

Hence to promote sustainable tribal development, there is a need of clear cut strategy. A strategy in this context means a planned design aimed to tackle the problems concerning economical, social and ecological sustainability issues of tribal development in the state.

Based on the issues found in the study, the following general guidelines are suggested for sustainable tribal development in Kerala.

4.7.1 Economic Sustainability

Issues

- Limited access to factors of production and no control over land resources by the tribes especially in Wayanad district.
- Less employment and income generating opportunities for tribes in all the three districts
- No control over minor forest produces by the tribes especially in Wayanad district
- Less agricultural productivity and high demand on external inputs

Strategy

Control over land resources :

- Tribals should be given the sufficient cultivable land and its full legal rights on land and the control and management of land resources.
- Government policy must give priority to meet the needs of local tribes by making the resource base (grazing land, river, fish stock, minor forest produces etc.) more productive and accessible to the local tribes.

Employment and income generation:

- Some of the cottage, small and medium forest based industries like saw milling, furniture making, etc. should be locally established to generate employment for the tribals.
- Direct and sustained employment of the tribals should be built into the forestry based production programme.
- Forestry operations should be executed only through tribal co-operatives of forest labourers which will substitute contractors.
- Vocational training should also be imparted to tribal youth in different areas and they should be made to render their services in tribal areas.
- Training should be imparted to tribal people in skilled and other artisans work.
- Organise the tribal hamlets as self help groups under *Kudumbasree* and promote self employment activities among group members.
- Tribals should be encouraged to take up rural industries based on locally available natural resources.
- Selected tribal youth can be organized as self-help groups in each panchayat, train them in masonry skilled work and entrust all sorts of construction work for tribals to these self help groups.

Control over minor forest produces:

- Government should interfere in modifying the forest laws and policies in such a manner that it should help the tribes for their livelihood.
- The right of tribals in the collection, processing and storage of minor forest produces should be protected by the government.

Agricultural productivity optimization:

- Implement land improvement programmes mainly through introduction of irrigation facilities.
- Introduction of improved technology, seeds of high yielding varieties and other inputs for increasing productivity and impart training in the use of improved technology.
- Give more priority for watershed based agricultural development programmes in tribal areas.
- Development intervention must be planned and designed in such a way to minimize external inputs and maximize potential use of locally available resources.
- Identification and collection of indigenous medicinal and aromatic plants and their organized cultivation under self help groups or Oorukkuttams for employment and income generations.
- Nursery raising on a co-operative effort under tribal self help groups / Oorukkuttam level.
- Improvement of the livestock sector as a subsidiary occupation will provide additional employment and income. For this, the following has to be taken into consideration.

  Substitution of local variety by hybrid variety to increase the production of milk and cowdung.

  Development of piggery, goatery, poultry etc. on a co-operative basis under SHGs.

4.7.2 Social Sustainability

Issues

- No food security to tribals especially in Wayanad district
- No housing security to majority of the tribes in Wayanad district
- Low level of literacy and no opportunity for better education of tribes especially in Wayanad and Palakkad districts
- Poor standard of health and nutritional security for the tribes
- Low level of participation in public life
- No awareness regarding socio-political empowerment
- Right information is not ensured to majority of tribes in all the three districts
- Human right security of the tribes are not protected by the government
- Development intervention is not based on indigenous knowledge and practices
- Moral values of the tribes are not promoted and hence greater exposure to drugs and alcoholism especially among the tribes in Wayanad and Palakkad districts
- Deterioration of cultural heritage due to land alienation and external interference
- Deterioration of tribal hamlet system
- Poor institution building among the tribes in Wayanad
- Poor infrastructural development facilities in the tribal hamlets of Wayanad

Strategy

Food security

- In order to attain the food security of tribes the government should ensure 'Foods Sovereignty' to tribal people. It is the right of tribal community to define their own agricultural, labour, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to safe, nutritious and culturally appropriate food and to food producing resources and the ability to sustain themselves and their societies.
- Government should take steps to implement *Community Food Bank System* at the village / hamlet level with initial supplies as grant from government and donor agencies like World Food Programme. Later such community food bank can be sustained through local purchases and from continued government and international support.
- Ensure efficient use of natural resources of land, water and plant diversity to ensure the food security.
- Prepare action plan for strengthening and expanding the *Targeted Public Distribution System* exclusively for tribal areas.

Housing security :

- Ensuring pucca house to tribal people which are culturally compatible. The house construction must be entrusted with the trained tribal SHGs under the control of Local Self Government Institutions / Oorukkutams.
- Improvement of the present houses through LSG institutions with maximum possible financial assistance.
- Give more thrust to the housing security of tribes in Wayanad

Human resource development:

- Since the level of education and educational awareness act as vehicles for any socio-cultural and economic uplift, human resource development has to be given more importance in sustainable tribal development.
- LSG institutions should have provision for creches and day-care centres in each hamlet for the tribal infants (below 3 years) so that they would be brought up in a more congenial surrounding when both parents are out for work. The responsibility of conducting day-care centres must be entrusted with the educated tribal women with honorarium or NGOs in tribal area.

For provision of primary and secondary education,

a) Revive and improve the conditions of existing primary schools in the tribal areas with special reference to Wayanad

b) Create one-teacher primary school at hamlet level where no other provision exists and provide principal meal, uniforms and scholarships for preventing school dropouts in Wayanad and Palakkad.

c) Create night schools and centres for conducting adult education programmes.

- Ensure periodic monitoring by LSG institutions/Tribal Development Department.
- Education and functional literacy encompassing constitutional benefits and protective regulations, safeguards etc.
- Establish more model residential schools in three districts with tribal hostels providing all living amenities so that the fullest development of tribal children may be ensured and prevent school dropouts.

- Ensure better teachers – empathetic towards tribals, having interest in their culture and knowing tribal dialect, preferably female should be appointed in these schools. Give more preference to educated tribal women.
- The government should ensure proper representation of scheduled tribe students in the higher secondary / professional / Technical institutions at government / self financing level. For this, a steering committee should be constituted in each year to monitor the situation exclusively for tribal students.
- A special educational package may be established for Wayanad district with special reference to Adiyans, Paniyans and primitive tribal groups.

Health and nutritional security :

- Ensure conscentization about the health and nutritional security to the tribal people especially in Wayanad and Palakkad.
- Ensure the health and nutritional security through environmental hygiene, improving primary health care facilities and clean drinking.
- Provide health care, education to tribes with special reference to Wayanad and Palakkad with emphasis on prevailing health problems and the methods of preventing them, promotion of food supply and proper nutrition, adequate supply of safe water and basic sanitation, intensive maternal and child health care, immunization against major infectious diseases and provision of essential drugs.
- Provide adequate infrastructure facilities for health institutions by the LSG institutions.

Ethno-development

- The government should take into consider all the principles of ethno development *viz.*, decentralization, prioritization in development, social justice and equity and ecological balance etc. in designing and implementing tribal development programmes.

Participation :

- The development initiatives of the LSG / Tribal Development Department should be based on the needs identified by local people and hence try to get involve them in the planning and implementation of programmes using the principles and techniques suited to local conditions. This process must be include all sections of the community especially women.
- Under LSG institutions, Tribal's Own Gramasabhas may be organized in tribal dominated panchayats and give due representation to the representatives of tribal orgnizations in the gramasabhas.
- The government / LSG should ensure a humanistic-democratic participative management philosophy being the only practical way to get the beneficiaries committed to the development programmes and to build local capacity.

Socio-political empowerment:

- For social empowerment, government / development agencies should ensure that the tribals should be able to join fully in all forms of community life irrespective of religion, colour, sex or race.
- Ooruvikasana Samithies may be registered in each panachayat and the government should give more power and autonomy to these Ooruvikasana Samithies.
- Tribal Advisory Councils may be formed in tribal dominated panchayat including the conveners of all Ooruvikasana Samithies and leaders of

registered tribal organizations in the panchayat and entrust with them the responsibility of planning and implementation of tribal development programmes in he panchayat.

- Detach Scheduled Tribes from the present State SC/ST Advisory Committee and separate Scheduled Tribes Advisory Committee / Scheduled Tribes Development Council may be established at State and District level and it should act as an apex body of the tribal advisory councils at panchayats. The people's representatives, development officials, sociologists, leaders of registered tribal organizations etc. may be included in the council.
- The Government should consider the tribal representatives to be included in the Working Group for planning and implementation of tribal development programmes.
- The government should also ensure the participation of tribes in the State Planning Board.

Strengthening hamlet system

- Community system is a way of life of tribal society and hence the tribal hamlets should be strengthened in all respect for their community living and sustainable development. \

Protection of cultural heritage

- The government and all development agencies should give first priority for the protection of cultural heritage. Tribal Folklore Academy with Tribal Museum may be initiated in these three districts and maintained with tribal participation.

Human right security

- The government should establish and strengthen the *Tribal Courts* in tribal dominated districts inorder to handle the violation of human rights among the tribes.

- Government should ensure the representation tribes in SC / ST Commission and Human Rights Commission.

Institution building

- The government should take more interest to establish socio-economic and educational institutions for the tribes in Wayanad district.

Infrastructure development

- The LSG institutions should urgently look into the need based, location specific infrastructure development in tribal hamlets with the active participation of Ooruvikasana Samithies / SHGs

Right to information

- Establish and strengthen tribal self help groups / Ooruvikasana Samithies / Kudumbasree units in each hamlet.
- Scheduled tribe promoters may be strictly monitored by the authorities to improve their extension work.

4.7.3 Ecological Sustainability

Issues

- Natural resources in the tribal area is not conserved, maintained and utilized for the tribal development due to exploitation of natural resources by external agencies and alienation of tribal land especially in Wayanad district.
- Tribal eco-system is not preserved and maintained due to increased level of deforestation and destruction of biodiversity which affect their traditional life supporting system.
- Indigenous knowledge system of tribes are not conserved in all the three districts.
- Laws in establishing intellectual property right and patenting will badly affect indigenous knowledge system of tribal people.

Strategy

Resource conservation

- Natural resources in the tribal land should be conserved by the local self government institutions / Oorukkuttoms
- Ensure community management of natural resources with the active participation of tribals

Ecosystem preservation

- The government should protect and preserve the tribal ecosystem at any cost by establishing *Tribal Area Development Councils* with statutory power.
- Ecosystem preservation must be done by maintaining its ecosystem integrity and biodiversity – genetic diversity, species diversity and ecosystem diversity. Inorder to conserve the biodiversity, natural ecosystem must be protected.

Indigenous knowledge system

- Indigenous knowledge of tribals must be protected through appropriate community right system
- Principle of participatory local governance should be vigorously pursued
- Ensure the tribal people's representatives on National Biodiversity Authority and State Biodiversity Board

The strategy suggested in the study is only of general nature and the inherent feature of any strategy is that it can slightly vary from region to region and community to community during implementation. In such cases, flexibility in the strategy is required based on the context, reality of circumstances and resources.

Sustainable development is directly concerned with increase in the material standard of living of the poor at the 'grass roots' level, which can be quantitatively measured in terms of increased food, real income, educational services, health care, sanitation and water supply, emergency stock of food and cash, etc., and only indirectly concerned with economic growth at the aggregate, commonly national level. In general terms, the primary objective is reducing the absolute poverty of the tribal poor through providing lasting and secure livelihoods that minimise resource depletion, environmental degradation, cultural disruption and social instability.

In order to achieve sustainable tribal development, there is urgent need for proper intervention of the State and the political apparatus and the administrative system and they interact with the poorest of the poor, to enable them to develop faster and actively participate in the development process. This requires re-orientation of the present Tribal Development Department and decentralisation tribal development programme at grass root level with the active participation of tribal people and strengthening of democratic institutions which can sustain this growth.

The registered Tribal Self Help Groups under the leadership of educated tribal youths may be formed in each panchayat and entrust all sorts of development initiatives with them. The Tribal Development Department and Panchayat Raj institutions may be taken the role of development facilitators in due course.

Similarly the tribal development policy may be formed in such a way that include all dimensions of economic, social and ecological sustainability. It demands an increase in literacy and education of women and girls and a drastic reduction in the inefficiency and wastage in our schooling system expressed in the massive drop out rate of tribal students and unemployment. It demands such a policy which is based on dispersed pattern of tribal settlements, availability of safe drinking water and

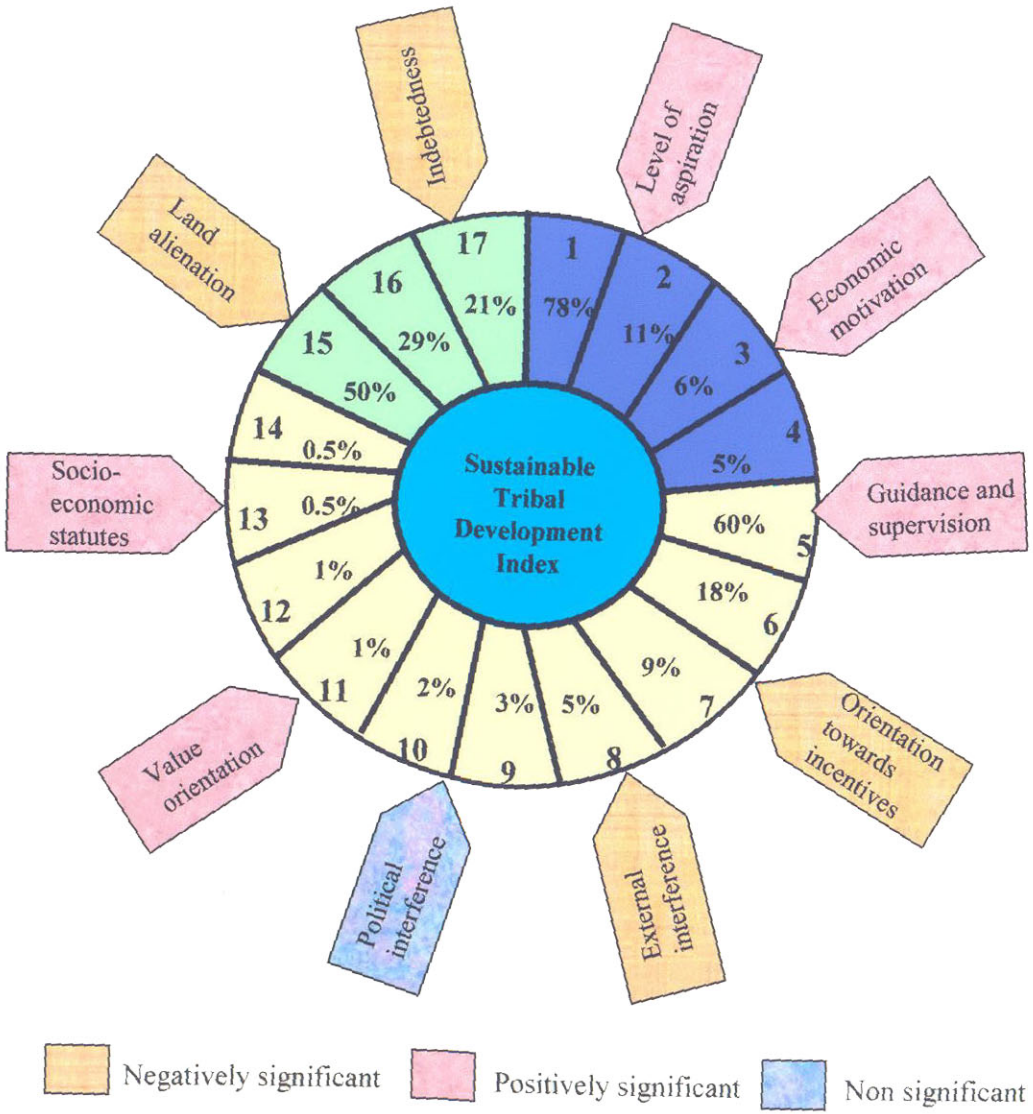
housing. Above all, it demands a positive approach to the major socio-economic problems of unemployment, poverty and inequality.

The real concern should be to instill the development instinct in the minds of tribal households. The issue at stake is to prepare the tribal society for becoming an active participant in the development relay-race.

4.8 EMPIRICAL MODEL OF THE STUDY

The empirical model of the study showing the percentage contribution of identified dimensions towards the sustainable tribal development index and significant factors influencing the sustainable tribal development index are presented in Fig. 20.

Results of principal component analysis revealed that four dimensions under economic sustainability, ten dimensions under social sustainability and three dimensions under ecological sustainability are significantly contributed towards sustainable tribal development index. Other dimensions had only negligible contribution towards sustainable tribal development. With regard to factors influencing sustainable tribal development index it could also be observed that out of the ten factors, nine factors have significantly influenced the sustainable index except political interference.



Economic sustainability

1 Control over land resources
2 Employment and income generation
3 Control over minor forest produces
4 Agricultural productivity optimization

Social sustainability

5 Food security
6 Housing security
7 Human resource development
8 Health and nutritional security
9 Participation
10 Ethno-development
11 Socio-political empowerment
12 Protection of cultural heritage
13 Institution building
14 Infrastructure development

Ecological sustainability

15 Resource conservation
16 Ecosystem preservation
17 Indigenous knowledge system

Fig. 20 Empirical model of the study

Summary

5. SUMMARY

Tribes in Kerala form the very segment of weaker sections of the society with their traditional skills and resources. The natural isolation has deprived off the fruits of development and scientific and technological advancement. Hence they become the most vulnerable section of the population in Kerala. The planned efforts through different Five Year Plans made towards the social and economic development of the tribals have not resulted in much perspective change in the living conditions of tribal population.

In Kerala the strategy adopted during Ninth Plan was to year mark and give more than two third of the Tribal Sub Plan fund as grand-in-aid to LSG institutions for the purpose of formulating and implementing tribal development programmes at grass root level with the active participation of tribals. Even then, the benefits percolated to the tribals are not in proportion to the investment made and the question of sustainability of development still exists. Hence a systematic study on sustainable tribal development is the need of the hour and that is why the present study is initiated.

'Sustainable tribal development in Kerala – a methodological study' was undertaken with the following objectives.

1. To delineate the dimensions of sustainable development of tribals
2. To formulate a sustainable development index to measure the sustainability of tribal development in Kerala
3. To delineate the factors influencing Sustainable Tribal Development Index
4. To assess the extent of inclusion of dimensions of Sustainable Tribal Development in the selected tribal development programmes under Tribal Sub Plan implemented in Kerala for the period from 1997-2000.

The study was conducted in Wayanad, Idukki and Palakkad districts since these districts were having highest tribal population as first, second and third respectively in Kerala. From each selected district three blocks having maximum tribal population was identified. Then one panchayat each having maximum tribal population was identified from each block and using proportional allocation method according to population of tribals, 200 respondents were selected from the tribal hamlet for the study.

The data were collected using a pre-tested interview schedule. The dependent variable selected for the study was Sustainable Tribal Development Index comprised of economic, social and ecological sustainability indices. The independent variables were the factors influencing the Sustainable Tribal Development Index *i.e.,* socio-economic status, land alienation, level of aspiration, economic motivation, guidance and supervision, orientation towards incentives, external interference, political determinism and value orientation.

Statistical techniques namely percentage analysis, mean, simple correlation analysis, analysis of variance, principal component analysis were done.

The results of the study are summarized and presented below.

In connection with delineation of dimensions of STDI, various dimensions of sustainable tribal development index under three major subdimensions were identified using Nominal Group Technique and these dimensions were prioritized using Policy Delphi Technique. The delineated dimensions with scale value are as follows. Under economic sustainability there are four dimensions identified. They are control over land resources (2.82), employment and income generation (2.50), control over minor forest produces (2.44) and agricultural productivity optimization (2.25). The dimensions identified under social sustainability are food security (2.63), housing security (2.57), human resource development (2.31), health and nutrition security (2.12), participation

(2.00), ethno-development (1.93), socio-political empowerment (1.81), protection of cultural heritage (1.74), institution building (1.43), infrastructure development (1.36), strengthening hamlet system (1.24), right to information (1.17), human right security (1.15), promotion of moral value (0.98), development facilitatory linkage (0.86). The delineated dimensions of STDI under ecological sustainability are resource conservation (1.68), ecosystem preservation (1.62) and indigenous knowledge system (1.49).

The economic sustainability index value of nine panchayats in three districts revealed that average ESIV of tribes in Kerala ranges from 8.73 to 15.81 which is very poor inspite of the massive expenditure made by the government for economic development of tribes. The results also indicated that ESI is higher in Palakkad and least in Wayanad districts. Possession of agricultural land, employment and income generation from farming and agricultural productivity optimization may be the reason for higher index value in Palakkad. In Wayanad majority are agricultural labourers, employment and income generation is very poor, no control over land resources etc. may be the reason for low ESIV. Critical differences in economic sustainability exists between different panchayats in three districts.

Correlation study of dimensions of economic sustainability index revealed that all the four dimensions – control over land resources, employment and income generation, control over minor forest produces and agricultural productivity optimization had positive and significant correlation with ESIV. Principal component analysis showed that the first linier combination of dimension (control over land resources) yielded 78.32 per cent of total variation in economic sustainability followed by employment and income generation (11.13 %), control over minor forest produces (5.89 %) and agricultural productivity optimization (4.62 %).

With regard to Social Sustainability Index Value (SSIV) of nine panchayats in three districts indicated that average SSIV ranged from 7.95 to 34.40 with highest value in Palakkad (34.40) followed by Idukki (29.31) and least in Wayanad (7.95). Comparatively more access of tribal people to dimensions of food security, housing security, health and nutrition security, human resource development and participation etc. and huge expenditure of funds spent for tribal development in Attappadi may be the reason for higher value of SSIV in Palakkad and case is reversed in Wayanad.

Correlation analysis indicated except promotion of moral value and facilitatory linkage, all 13 dimensions had positive and significant relationship with SSIV. The significant dimensions are food security, housing security, human resource development, health and nutrition security, participation, ethno-development, socio-political empowerment, protection of cultural heritage, institution building, infrastructure development, strengthening hamlet system, right to information and human right security. The high correlation coefficient clearly indicated that the dimensions included in the study were not extraneous but rather form the part of social sustainability index value.

The principal component analysis of the dimensions of social sustainability indicated that the first linear combination of dimensions yielded 60.05 per cent of total variations and second combination of principal component contributed 18.09 per cent. In the first linear combination larger magnitude of variation was contributed by dimensions such as food security followed by housing security, ham resource development, health and nutritional security etc.

The analysis Ecological Sustainability Index value of nine panchayat in three districts indicated that average index value ranged from7.72 to 17.76. The results also revealed that Palakkad district had the highest ecological sustainability index value (17.76) followed by Idukki

(14.35) and Wayanad (7.72). No much critical differences ecological sustainability occurred in different panchayats except in Palakkad district.

Correlation study of dimensions of ecological sustainability revealed that all the three dimensions had significant and positive relationship with ecological sustainability of tribes. Principal component analysis of the dimensions of ecological sustainability indicated that dimensions such as ecosystem preservation (49.86 %) and resource conservation (29.09 %) contributed higher magnitude of variation followed by indigenous knowledge system (21.04 %).

The analysis of Sustainable Tribal Development Index Value (STDIV) revealed that the range of STDIV is only between 8.25 to 22.56 observed in three districts which accounts for more than 65 per cent of tribes in Kerala. This indicated the pathetic situation of tribes in Kerala in the development sector inspite of massive expenditure of funds for tribal development. Among the three districts Palakkad district is having the highest STDIV (22.56) followed by Idukki (18.96) and Wayanad (8.25).

The correlation study of dimensions of sustainable tribal development indicated that all dimensions except promotion of moral value and development facilitatory linkage had positive and significant relationship with STDIV at 0.01 level of probability.

Regarding the distribution of respondents based on dimension of economic sustainability index revealed that in Palakkad and Idukki districts majority of respondents had control over their land resources. While in Wayanad, a huge majority had less control over their land resources. In the case of employment and income generation majority of tribes belonged to low category in all the three districts. As far as the minor forest produces are concerned, majority of tribes in Palakkad and Wayanad are having low control and right over minor forest produces collection and in Idukki majority belonged to medium category.

Regarding the distribution of respondents based on the dimensions of social sustainability majority of tribes in Palakkad and Idukki belonged to medium category and majority belonged to low category in Wayanad as well as the food security and housing security dimensions are concerned. In the case of human resource development majority of tribes in Palakkad and Idukki belonged to medium category and tribes in Wayanad belonged to low category. With regard to health and nutrition security, in Palakkad (55.6 %) and Idukki (50.9 %) medium health and nutritional security are ensured to majority of respondents and in Wayanad it is very low (79.5 %). Ethno-development is not ensured to majority of respondents in three districts. In the case of participation and strengthening hamlet system majority of respondents in Palakkad and Idukki districts belonged to medium category and low category in Wayanad district. With regard to socio-political empowerment majority of respondents belonged to medium and low categories in Palakkad, Wayanad and Idukki respectively. Majority of respondents in Palakkad (61.80 %) and Idukki district (53.2 %) belonged to medium category and low category in Wayanad as far as the institution building and infrastructure development dimensions are concerned. Regarding right to information, majority of respondents belonged to low category and it is also noted that promotion of moral value is low among the tribes in Palakkad and Wayanad and medium category in Idukki district. As far as the development facilitatory linkage is concerned, majority of tribes in Palakkad and Idukki belonged to medium and low category in Wayanad.

Regarding the distribution of respondents based on dimensions of ecological sustainability, majority of tribes in Palakkad and Idukki belonged to medium category in the case of resource conservation and ecosystem preservation. But in the case of indigenous knowledge system majority belonged to medium category in Palakkad (54.5 %) and Idukki (56.2 %) and low in Wayanad districts (55.7 %).

The study on distribution of factors influencing STDI revealed that socio-economic status is low among the majority of tribes in Palakkad (52.7 %) and Wayanad (87.50 %) districts and medium in Idukki (53.1 %). It could be observed that land alienation is comparatively low in Palakkad (56.4 %) and Idukki (59.5 %) but high in Wayanad (58.3 %). Regarding indebtedness majority of tribes in Palakkad (57.1 %) and Idukki (50.9 %) belonged to low category, while in Wayanad indebtedness is high (70.40 %). In the case of factors like level of aspiration and economic motivation, the majority of tribes in Palakkad and Idukki belonged to high category but in Wayanad it is low.

It could be observed that guidance and supervision from the implementing agency of tribal development programmes is high in Palakkad (64.5 %) and low in Idukki (57.9 %) and Wayanad (73.2 %). In case of orientation towards incentives majority of tribes in three districts belonged to high category. With regard to factors like external interference and political determinism, external interference is high in Palakkad (60.35 %) and Wayanad (64.6 %) and low in Idukki (41.50 %) but while in the case of political determinism, majority of respondents in all the three districts opined that political determinism is high which made interferences with their development process. It could be also observed that the factor influencing STDI like value orientation is low among the majority of tribes in Palakkad (52.5 %) and Idukki (58.4 %) districts but high in Wayanad districts (59.65 %).

Study on correlation of factors influencing STDI with STDIV revealed that all factors except land alienation, indebtedness, orientation towards incentives, external interference and value orientation indicated positive and significant association with STDIV while political interference indicated a non-significant relationship with STDIV.

With regard to selected tribal development programmes during 1997-2000, it could be observed that major part of the TSP funds have

been set apart for service sector schemes (51.56 %) followed by infrastructure (26.61 %) and productive sector (21.85 %). Regarding the extent of inclusion of dimensions in the selected tribal development programmes revealed that out of 22 dimensions, more number of dimensions have been included in the agricultural development scheme followed by education, drinking water, health, infrastructure and housing.

Among the selected dimensions maximum index value is obtained for the dimensions *viz.*, development facilitatory linkage (73.5) followed by health and nutritional security (58.1), infrastructure (30.4), participation (28), human resource development (26.2), agricultural productivity optimization (25.5), food security (25.2), control over land resources (24.1), employment and income generation (23.1), indigenous knowledge system (22.6), ecosystem preservation (20.3), promotion of moral value (18.3), housing security (16.3), ethno-development (15.2), protection of cultural heritage (9.5) and right to information (2.6). It could be observed that the dimension – participation has been included in all the selected schemes and its average index value obtained is maximum for infrastructure development scheme (28). The maximum index value obtained for the dimension – development facilitator linkage (73.5) and the presence of participation in all the selected schemes may be due to the planning and implementation of tribal development programme through local self government institutions under People's Plan with the active participation of tribals and non-tribals at the Gramasabhas. It could also be observed that the dimensions like control over minor forest produces, socio-political empowerment, institution building, strengthening hamlet system and human right security have been not attended by the government and LSG.institutions in any of the schemes.

It could also be noted that the average index value for the selected scheme - agricultural development has got higher index value (10.9) followed by education (9.68), health (8.5), infrastructure development

(8.0), drinking water (6.6 %), food support programme (5.7) and housing (5.6).

It is suggested that the strategy for sustainability in tribal development can be achieved only by including all possible dimensions of economic, social and ecological sustainability in tribal development programmes with more emphasis on dimensions *viz.*, control over land resources, food security, employment and income generation, housing security, human resource development and participation.

Implication of the Study

The economic sustainability index, social sustainability index, ecological sustainability index and sustainable tribal development index developed in the study can be used to assess the sustainability of tribal development in the respective areas. The indices have been deliberately made simple so that government or any agencies interested in using them could do so with ease in recording the responses of tribal people as well as in computing economic sustainability index value, social sustainability index value, ecological sustainability index value and sustainable tribal development index value.

The study of economic sustainability index, social sustainability index, ecological sustainability index and sustainable tribal development index brings out the major 22 dimensions of sustainable tribal development.

The strategy developed for sustainable tribal development may be taken as guidelines in the formulation of specific programmes to promote sustainable development among the tribals.

Average sustainable tribal development index in Wayanad is very low when compared to other two districts studied where major tribal communities are Adiyans and Paniyans. Hence concentrated efforts from all the quarters *viz.*, governmental, LSG institutions and NGOs are required to promote sustainability in tribal development in Wayanad district.

Among the four dimensions of economic sustainability, dimensions such as control over land resources, employment and income generation had emerged as important in determining economic sustainability index. Dimensions of social sustainability index *viz*., food security, housing security, human resource development, health and nutritional security, ethno-development and participation were found as important dimensions in determining social sustainability of tribal development. Among the three dimensions of ecological sustainability, dimensions such as resource conservation, ecosystem preservation and indigenous knowledge system had emerged as important in determining ecological sustainability of tribal development.

Hence, the above mentioned dimensions are to be given maximum importance and included in the tribal development programmes in the future.

The influencing factors of sustainable tribal development *viz*., socio-economic status, land alienation, indebtedness, level of aspiration, economic motivation, guidance and supervision, orientation towards incentives, external interference, political interference and value orientation should also take into consideration while formulating sustainable tribal development programmes.

The sustainable tribal development index formulated in the study will help in making suitable strategy for the sustainable tribal development in Kerala.

Suggested areas of future research

1. Studies to revalidate the economic sustainability index, social sustainability index, ecological sustainability index and sustainable tribal development index are to be conducted for its application in other areas of weaker sections.
2. Action research studies may be conducted to investigate the performance of different tribal communities towards he sustainability of development in economic, social and ecological areas.

3. Indepth studies into the dynamics of sustainable tribal development may be undertaken.
4. A comparative research study can be conducted in the formulation and implementation of Tribal Sub Plan Schemes by the Tribal Development Department and LSG institutions.
5. Research work can also be initiated in the tribal development programmes of Non-Governmental Organizations.

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*Original not seen

Appendices

APPENDIX – I

Definition of sustainable tribal development

KERALA AGRICULTURAL UNIVERSITY
College of Agriculture, Vellayani – 695 522

Dr. G. Sobhana
Associate Professor

Department of Agricultural Extension

Dear Sir / Madam,

I am pleased to inform you that my Ph.D. student Mr. T.V. Rajendralal has taken up a research study on "**Sustainability of Tribal Development in Kerala – a methodological study**".

The main objective of the study is to delineate the dimensions of sustainable development of tribals and formulate a 'Sustainable Development Index' (SDI) to measure the sustainability of tribal development in Kerala.

In this context the operational definition of sustainable tribal development is furnished for your remarks. Kindly express your opinion (✓) on whether the given definition is adequate or not adequate. If not, kindly furnish the necessary suggestions also.

Operational definition of sustainable tribal development	Opinion	
	Adequate	Not adequate
"Sustainable tribal development refers to the socio-economic and cultural progress that empowers the tribal society in meeting their own basic needs, to provide support services including education, health care, social justice and human rights and enabling their control over their land resources, social organization and culture to attain lasting improvements in their quality of life".		

Suggestions if any:

Thanking you,

Yours sincerely,

Vellayani

Dr. G. Sobhana.

APPENDIX - II

Dimensions of Sustainable Tribal Development

KERALA AGRICULTURAL UNIVERSITY

Dr. G. Sobhana
Associate Professor

Department of Agrl. Extension
College of Agriculture, Vellayani
Thiruvananthapuram – 695 522.

Dear Sir / Madam,

I am pleased to inform you that my Ph.D. student Mr. T.V. Rajendralal has taken up a research study on "**Sustainability of Tribal Development in Kerala – a methodological study**".

The main objective of the study is to delineate the dimensions of sustainable development of tribals and formulate a 'Sustainable Development Index' (SDI) to measure the sustainability of tribal development in Kerala.

For this study the researcher has identified a list of possible dimensions of sustainable tribal development (Dependent variables) from the pilot study conducted, literature, discussion with tribal experts and Extension Scientists (Annexure I). The personal, socio-psychological and environmental factors influencing the dimensions of sustainable development (independent variables) have also been identified based on review of literature and discussion with experts. These are listed in the Annexure II along with their operational definitions.

Considering your vast experience in the field of extension/ development research, you are selected as a judge to rate the relevancy of the variables on a 5-point continuum ranging from most relevant to least relevant. Please put a tick mark (✓) against each of the variables to indicate your judgment on the degree of relevance of the variables. Since it is conceptualized that the dimensions of sustainable tribal development have differential significance, you are also requested to assign weightages to these dimensions ranging from 1-10 in the columns provided for the purpose. You are free to add more number of dimensions/variables.

I am conscious of your pre-occupations. Yet I do hope you would kindly spare some time to give your valuable judgment and kindly return the same to the researcher in the stamped envelope at the earliest.

Thanking you,

Yours sincerely,

Vellayani

Dr. G. Sobhana.

APPENDIX – II Continued

KERALA AGRICULTURAL UNIVERSITY

Dr. G. Sobhana
Associate Professor

Department of Agrl. Extension
College of Agriculture, Vellayani
Thiruvananthapuram – 695 522.

Dear Sir / Madam,

I am pleased to inform you that my Ph.D. student Mr. T.V. Rajendralal has taken up a research study on "**Sustainability of Tribal Development in Kerala – a methodological study**".

The main objective of the study is to delineate the dimensions of sustainable development of tribals and formulate a 'Sustainable Development Index' (SDI) to measure the sustainability of tribal development in Kerala.

The definition of the selected dimensions and a comprehensive and exhaustive list of items related to the dimensions under study are enclosed herewith.

Considering your vast experience in the field of extension / development research, you are selected as a judge to assess the relevancy of each item in measuring the dimension corresponding to them on a three point continuum ranging from most relevant to least relevant. Please put a tick (✓) mark against each of the item to indicate your judgment on the degree of relevance of items in measuring the concerned dimensions.

I am conscious of your pre-occupations. Yet I do hope you would kindly spare some time to give your valuable judgment and kindly return the same to the researcher in the stamped envelope at the earliest.

Thanking you,

Yours sincerely,

Vellayani

Dr. G. Sobhana.

APPENDIX II Continued

DIMENSIONS OF SUSTAINABLE TRIBAL DEVELOPMENT INDEX

Sl. No.	Dimensions	Most relevant	More relevant	Relevant	Less relevant	Least relevant	Weightage
I	**Economic sustainability** Economic sustainability of tribal development is the extent to which tribal development focus on growth of tribal life in a quantitative and economic terms which demands a sustainable, per capita income and efficiency in use of resources and investment for their economic development. **1. Control over land resources** – refers to the possession of sufficient land, the right and control of tribal people on their land and land resources for their secure living and the extent to which the land right is protected by the government. **2. Employment and income generation** It means to create regular employment opportunities and sustainable income for the tribal people. **3. Control over minor forest produces** It refers to the control of tribal people on collection and marketing of minor forest produces available in the forest area. **4. Agricultural productivity optimization** means the extent to which agricultural productivity of the tribal habitat is sufficient for their sustained living. **5. Economic feasibility** - refers to whether the tribal community can afford to adopt the technology or development programme within their realm of financial status. **6. Equity** – refers to the extent to which tribals enjoy equitable access to opportunities. **7. Technological appropriateness** It refers to how far the technology involved in tribal development programmes fit the social and infrastructural situations of the tribals in Kerala.						

II	**Social Sustainability** Social sustainability of tribal development refers to how well a tribe can meet the basic human needs such s food, shelter and clothing. It also involves providing the support services that can improve the quality of tribal life including education, health care, culture and human rights. **8. Food security** refers to the extent to which the tribal families get sufficient food for their subsistence living. **9. Housing security** – refers to the provision of enough housing facilities to the tribal people which are suited to their local settings and without affecting their ecosystem. **10. Human resource development** It means the access to education for all tribal people and the extent to which the educational programmes help the tribal people for their capacity building, empowerment and skill development. **11. Health and nutritional security** – It means providing promotive, preventive, curative and rehabilitative health services and nutritional security. **12. Ethno-development** – Ethno development of tribal people refers to the extent to which the tribal people have the right to choose what to conserve and what to change, what to adopt and what to reject from other cultures and all those in what pace and intensity in this fast changing world. The basic principles of ethno-development are self sufficiency, prioritisation of developmental issues, decentralisation, equity and social justice. **13. Participation** : It means the extent of participation of the respondents in decision making, implementation, monitoring and evaluation of their developmental activities. **14. Socio–political empowerment** : It refers to the extent of power, status, self-confidence and the opportunity to develop a sense of autonomy and ability to lead their own life by means of participation in the socio political activities. **15. Strengthening tribal hamlet system** : It means the sustenance of tribal hamlet system for the purpose of protecting the value of traditional life supporting system.						

	16. Protection of cultural heritage This means the protection of identity and ethnic heritage of different tribal groups by the tribal society, government and other development agencies. **17. Human rights security** – It refers to the provision for protection of human rights of the tribal people by the government **18. Institution building** – It refers to establishment and maintenance of local level institutions to make the tribal development sustainable **19. Infrastructure development** – It refers to the development of infrastructure facilities at the tribal hamlets. **20. Right to information** : It refers to the rights of the tribal people to be better informed of their rights, privileges and transparency in the implementation of development programmes for them. **21. Promotion of moral values** – It refers to the extent to which the tribal development programmes are oriented towards minimising socially undesirable habits among tribal people and inculcate high morale. **22. Development facilitatory linkage** It means that the non-tribal people in the tribal area should act as a linkage with tribal people in facilitating the development interventions in the tribal areas. **23. Livelihood security**: Means security of stock of food and cash for the household and its members throughout the year and the means to meet contingencies. **24. Self sufficiency** – refers to the extent to which the tribals are self-sufficient in meeting their basic needs like food, shelter and clothing for day to day life. **25. Capacity building** – It refers to the tribal efforts that develop an ability to achieve their goals. Building capacity to achieve sustainability depends on available knowledge of the tribals and their ability to adapt and act upon this knowledge where it is needed.						

	26. Social acceptability – refers to the extent to which the tribal development programme is acceptable by the different sections of the tribal society. **27. Social security** – defined as the protection which the government / tribal society provides for its members, through a series of public measures, against the economic and social distress that otherwise would be caused by the stoppage or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, invalidity, old age and death etc. Social security is to protect members of the tribal community from any fall in their living. **28. Social justice** - Means distributive justice. Operationally defined as equitable allocation of social, material and economical resources of the general society among the members of the tribal society. **29. Cultural desirability** – refers to the extent to which the tribal development programme fits within the cultural patterns and values of the society. **30. Institutional development** - Refers to the development of local level institutions for the sustainable development of tribals.						
III	**Ecological Sustainability** Ecological sustainability of tribal development means ensuring the protection, conservation and better management of natural resources particularly those which are so vital for the survival of tribal life. **31. Resource conservation** It means the facilities for conservation of available natural resources of the tribal hamlet in such a way that it can be utilised for their development on a sustainable basis. **32. Ecosystem preservation** : It means all types of developmental interventions in the tribal area must be planned and implemented in such a way that they enrich and preserve the natural ecosystem of tribal people and not harming the ecosystem even to a small extent.						

33. Indigenous knowledge system – It refers to the conservation and protection of available indigenous knowledge with the tribal people in relation with all walks of human life. **34. Renewabiltiy** – refers to the extent to which the technology can be used and reused without any additional efforts and inputs. **35. Temporal stability** - refers to whether the positive aspects of the development programme remain stable in the long run.						

APPENDIX – 1II

Factors influencing the dimensions of sustainable tribal development index

Sl. No.	Personal and socio-psychological factors	Most relevant	More relevant	Relevant	Less relevant	Least relevant
	1. **Socio-economic status** – defined as the position of the tribe with respect to the prevailing education, land holdings, occupation, house, farm power and family.					
	2. **Land Alienation** - It is defined as the area of land sold out or transferred to others on any account by the respondent.					
	3. **Indebtedness** - Indebtedness is defined as the total debt in terms of money, a tribe owes to various money lending sources at the time of investigation.					
	4. **Economic motivation** – It was operationalised in terms of the relative value placed by a respondent on economic ends.					
	5. **Guidance and supervision** - It refers to the regular technical guidance and supervision provided by the Extension Staff in implementing tribal development programmes.					
	6. **Orientation towards incentives** - It refers to the orientation of tribal respondents towards the incentives and assistance provided by the government and other development agencies for tribal welfare.					
	7. **Level of aspiration** – refers to the tribal people's overall assessment of their concern for wishes and hopes for the future in his own reality world.					
	8. **Credit orientation** – refers to the orientation to avail credit by the respondent.					
	9. **Self reliance** – refers to the extent to which a person relies on self for his future.					
	10. **Achievement motivation** – refers to the striving of tribal respondent to do good work and attain a sense of accomplishment.					
	11. **Cosmopoliteness** – refers to tendency of the tribes to be in contact with outside village on the belief that all the needs of an individual cannot be satisfied within his own village.					
	12. **Experience in farming** – refers to the total number of years the respondent has been engaged in farming.					

	13. **Entrepreneurial behaviour** – refers to the ability of the tribe to exploit opportunities and initiate activities to increase income from farming/other sources. 14. **Market orientation** – refers to the orientation of the respondent to the available marketing facilities to dispose the minor forest produce of tribals. 15. **External interference** – External interference is operationally defined as the extent to which external agencies or people interfere in the development of tribals. 16. **Political interference** - It refers to the extent to which over emphasis is given to political consideration in the implementation of tribal development programmes. 17. **Value orientation** - It is defined as the belief held by the tribals that human situations and acts are pre-determined by some supernatural power and their positive attitude towards traditional institutions and practices. 18. **Community support** – refers to the extent of support and co-operation received from other non-tribal community in the development of tribals. 19. **Progressivism** – refers to the relative receptivity of tribals towards modern values and practices.					

Appendix - IV

Delineated dimensions of sustainable tribal development with scale valu

Economic sustainability	Scale value
1. Control over land resources	2.82
2. Employment and income generation	2.50
3. Control over minor forest produces	2.44
4. Agricultural productivity optimization	2.25
Social sustainability	
5. Food security	2.63
6. Housing security	2.57
7. Human resource development	2.31
8. Health and nutritional security	2.12
9. Participation	2.00
10. Ethno-development	1.93
11. Socio-political empowerment	1.81
12. Protection of cultural heritage	1.74
13. Institution building	1.43
14. Infrastructure development	1.36
15. Strengthening hamlet system	1.24
16. Right to information	1.17
17. Human right security	1.05
18. Promotion of moral values	0.98
19. Development facilitatory linkage	0.86
Ecological sustainability	
20. Resource conservation	1.68
21. Ecosystem preservation	1.62
22. Indigenous knowledge system	1.49

APPENDIX - V

KERALA AGRICULTURAL UNIVERSITY
Department of Agricultural Extension
College of Agriculture, Vellayani

SUSTAINABILITY OF TRIBAL DEVELOPMENT IN KERALA – A METHODOLOGICAL STUDY

Sl. No.:

Interview Schedule
Part - A

General informations

1. Name of the respondent
2. Age (in completed years)
3. Address
4. Name of tribe
5. Settlement
6. Panchayat
7. Block
8. Taluk
9. District
10. Religion and caste :

I. Socio-economic status

(a) Education

1. Illiterate	2. Can read only	
3. Read and write	4. Primary	
5. Upper primary	6. High school and above	
7. Technical	8. Professional	

(b) Land holdings

1. No land	2. Less than 10 cents	3. 10-25 cents
4. 26-50 cents	5. 0.51 – 1 acre	6. More than 1 acre

Wetland –
Dryland –
Total

(c) Occupation – Main/subsidiary

a. Own cultivation (Farming)
b. Agricultural labourer
c. Collection of minor forest produces
d. Business (specify)
e. Any other

(d) Farm power

1. No draught animal	2. 1-2 draught animals	
3. 3-4 animals	4. Power tiller / tractor	5. Any other

(e) House

1. No house	2. Hut (one room)
3. Katcha house	4. Pucca house

(f) Family

a. Single b. Nuclear c. Joint

(g) Social participation

Do you participate in the activities of any organisation ?

If yes, please indicate your position and frequency of attendance.

Sl. No.	Organisation / Institution	Member	Office bearer	How often do you attend the meeting		
				Regularly	Occasionally	Never
1	No membership in any organisation					
2	Grama panchayat					
3	Gramasabha					
4	Ooru Vikasana Samathi					
5	Oorukkoottam					
6	SHGs					
7	Co-operatives					
8	Tribal organisations					
9	Others (specify)					

II. Land alienation

a. Year of settling down

b. Extent of land in your possession at the time of settling

c. Present area

d. Area – Sold out
Given on lease
Mortgaged
Encroachment
Others (specify)

(e) The year in which the land is alienated :

(f) How much amount received :

(g) Amount used for what purpose :

III. Indebtedness

i) Do you borrow money ? Yes / No

If yes, indicate the purpose : ———————————— and sources,

Sources

Private money lenders
Co-operative society
Commercial banks
Private banks
Traders
Friends / relatives
Others (specify)

ii) Amount of loan

a) Terms of loan : Short term - Medium term - Long term

iii) a. Amount repaid

b. Amount outstanding

IV. Level of aspiration

Please express your future level of aspiration by answering Yes/No for the following statements

Sl. No.	Items	Yes/No
1.	Getting higher income	
2.	Developing farm	
3.	Possession of petty shop	
4.	Possession of new land	
5.	Livestock development	
6.	Higher education of children	
7.	Construction of pucca house	
8.	Getting a government job	

V. Economic motivation

Here are some statements. Please give your degree of agreement/ disagreement about each of the following statements.

Sl. No.	Statements	SA	A	UD	DA	SDA
1	A tribal family should work hard for economic profit					
2	The most successful tribal family is one which makes more profit					
3	A tribal family should try any new idea / occupation which may earn more money					
4	A tribal family must earn its living but most important thing in life cannot be defined in economic terms.					
5	It is difficult for one's children to make good start unless one provide them with economic assistance					

VI. Guidance and supervision

1	Does the Tribal Extension Officer regularly visit your hamlets and provides necessary advice	Yes / No
2	Does the higher level officers of the Tribal Development Department / Local Self Govt. visit the hamlet and give necessary advice for proper implementation of development programmes	Yes / No
3	Does the ST promoters help the tribal people to identify and solve the problems related to the development.	Yes / No

VII. Orientation towards incentives

Please indicate your extent of agreement or disagreement to the following statements.

Sl. No.	Statements	SDA	DA	UD	A	SA
1	Subsidies / assistance provided by the govt. motivated the tribal people to improve their quality of life					
2	Assistance provided by the Govt. is not adequate when compared to the actual expenditure					
3	Free PDS, housing, education etc reduced the hardship faced by tribals to lead a sustenance living					

VIII. External interference

Please indicate your opinion about the following statements

Sl. No.	Items	SA	A	DA	SDA
1	The non-tribals including settlers, private money lenders, private banks lure the tribal people into debt trap				
2	The non-tribals and other development agencies are not deliberately diverting the development benefits and development facilities envisaged for the tribal welfare				
3	The tribals are cheated by the non-tribals and other external agencies in enjoying the inputs, land and other development benefits				
4	The non-tribals are not deliberately trying to destroy your cultural identity and ethnic heritage				
5	The encroachment / invasion into the tribal traditional belief system in the name of development have an undesirable effect on sustainable tribal development				

IX. Political determinism

Sl. No.	Items	Yes	No
1	Do you believe that political parameters are considered as more important in gramasabha than developmental parameters		
2	Do you believe that undue importance and relevance is given to party politics in gramasabha which hamper the tribal development		
3	Do you believe that political polarization among the tribal community badly affects the tribal development		
4	Do you believe that tribal development is not properly planned and implemented by the Local Self Government due to the party politics		

X. Value – orientation (Conservatism – progressivism)

Sl. No.	Items	SA	A	DA	SDA
1	It is believed that value system associated with traditional ways of living hinders the development process of your society				
2	It is believed that most of the indigenous practices are eco-friendly and contribute to the sustainable development				
3	It is felt that an appropriate combination of modern and indigenous practices is essential for the sustainable development of tribal society				
4.	What is predestined must have its course				
5.	The traditional ways of life should be the guiding lines of our behaviour				
6.	Scientific knowledge can never be equal to traditional knowledge				

APPENDIX – V Continued

KERALA AGRICULTURAL UNIVERSITY
College of Agriculture, Vellayani – 695 522

Dr. G. Sobhana
Associate Professor

Department of Agricultural Extension

D.O. No. Ext.5/2003 Date : -08-2003

Dear Sir/Madam,

Sub : Research Project – Collection of data-reg.

Ref : Arising

Sri. T.V. Rajendralal, Ph.D. Scholar of this Department is doing his research work on "**Sustainability of Tribal Development in Kerala – a methodological study**" under my guidance. In this connection, he is in need of all the relevant details of planning and implementation of Tribal Development Programmes under T.S.P. for the period from 1997-2000. The details collected will be utilised solely for the purpose of research and the same will be duly acknowledged.

Hence I request that he may kindly be given the details of Tribal Sub-Plan Schemes (1997-2000 period) including budget allocation, financial and physical targets and achievements, name of beneficiaries etc., for the purpose of his research work.

Thanking you,

Yours sincerely,

G. Sobhana

To

1) The Secretary
..... Panchayat
.....

2) The Tribal Development Officer/ Project Officer, ITDP
Wayanad/Idukki/Palakkad

APPENDIX – VI

GOVERNMENT OF KERALA

Abstract

Local Self Government Department – Permission for collecting details of TSP Schemes implemented by Local Self Government Institutions for research purpose – granted – Orders Issued.

LOCAL SELF GOVERNMENT (P) DEPARTMENT

G.O.(Rt.) No.3271/2003/LSGD Thiruvananthapuram, dt. 15.09.2003

Read : Representation dt. 25.7.03 from Shri T.V. Rajendralal, Agricultural Officer, College of Agriculture, Vellayani, Thiruvananthapuram.

ORDER

In the representation read above, Shri. T.V. Rajendralal has requested Government to grant sanction for collecting details of planning and implementation of T.S.P. Schemes at Wayanad, Idukki and Palakkad Districts for the period from 1997-2000 for his Ph.D. work on sustainability of Tribal Development in Kerala.

2. In the circumstance Government are pleased to grant permission to Shri. T.V. Rajendralal, Agricultural Officer, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram to collect details of planning and implementation of T.S.P. Schemes for the period from 1997-2000 from the following Local Self Government Institutions.

1. Wayanad, Idukki and Palakkad District Panchayats
2. Sultan Batheri, Mananthavadi, Kalpetta, Idukki, Devikulam, Elamdesom, Attappadi, Chittoor, Kollengod Block Panchayats.
3. Thirunelli, Noolpuzha, Kaniyampetta, Arakulam, Kanthalloor, Velliyamattam, Agali, Perumatty, Muthalamada Grama Panchayats.

By Order of the Government
G. SASIKUMAR
Additional Secretary

To

Shri. T.V. Rajendralal, Agricultural Officer, Kerala Agricultural University, College of Agriculture, Vellayani, Thiruvananthapuram.

The Commr. for Bural Development / Director of Panchayats, Thiruvananthapuram

Secretary, District Panchayats, Wayanad, Idukki and Palakkad

Secretary, Block Panchayats, Mananthavadi, Kalpetta, Idukki, Devikulam, Elamdesom, Attapadi, Chittoor, Kollengod, Sulthanbattery.

Secretary, Grama Panchayats, Kaniyampetta, Arakulam, Kanthallor, Velliyamattam, Agali, Perumatty, Muthalamada

Stock File / Office Copy

Forwarded / By Order
Section Officer

SUSTAINABILITY OF TRIBAL DEVELOPMENT IN KERALA – A METHODOLOGICAL STUDY

RAJENDRALAL, T.V.

Abstract of the
thesis submitted in partial fulfilment of the requirement
for the degree of

Doctor of Philosophy in Agriculture

Faculty of Agriculture
Kerala Agricultural University, Thrissur

2005

Department of Agricultural Extension
COLLEGE OF AGRICULTURE
VELLAYANI, THIRUVANANTHAPURAM-695 522

ABSTRACT

The present study entitled "Sustainability of tribal development in Kerala – a methodological study" was undertaken to formulate a sustainable tribal development index to assess the sustainability of tribal development in Kerala by delineating the dimensions of sustainable tribal development. The factors influencing sustainable tribal development index and extension of inclusion of dimensions of sustainable tribal development in the selected tribal development programmes during the period 1997-2000 were also analysed in the study. Two hundred members of scheduled tribes from nine panchayats in three districts - Wayanad, Idukki and Palakkad were selected as the respondent for the study. Data were also collected using pre-tested interview schedule and suitable statistical techniques were employed in the analysis of data.

After arriving the definition of sustainable tribal development, the dimensions of sustainable tribal development index were delineated under three major sub dimensions *viz.*, economic, social and ecological sustainability using Nominal Group Technique and Policy Delphi Technique. The following are the identified dimensions with scale value. Under economic sustainability there are four dimensions identified. They are control over land resources (2.82), employment and income generation (2.50), control over minor forest produces (2.44) and agricultural productivity optimization (2.25). The dimensions identified under social sustainability are food security (2.63), housing security (2.57), human resource development (2.31), health and nutrition security (2.12), participation (2.00), ethno-development (1.93), socio-political empowerment (1.81), protection of cultural heritage (1.74), institution building (1.43), infrastructure development (1.36), strengthening hamlet system (1.24), right to information (1.17), human right security (1.15), promotion of moral value (0.98), development facilitatory linkage (0.86).

The delineated dimensions of STDI under ecological sustainability are resource conservation (1.68), ecosystem preservation (1.62) and indigenous knowledge system (1.49).

The economic sustainability index value of nine panchayats in three districts revealed that an average ESIV of tribes in Kerala ranged from 8.73 to 15.81 with highest ESI value in Palakkad district followed by Idukki and Wayanad. The correlation study of dimensions of economic sustainability index indicated that all the four dimensions – control over land resources, employment and income generation, control over minor forest produces and agricultural productivity optimization had positive and significant correlation with ESIV. Principal component analysis shown that the first linier combination of dimension (control over land resources) yielded 78.32 per cent of total variation in economic sustainability followed by employment and income generation (11.13 %), control over minor forest produces (5.89 %) and agricultural productivity optimization (4.62 %).

With regard to social sustainability index value of nine panchayats in three districts indicated that average SSIV ranged from 7.95 to 34.40 with highest SSIV in Palakkad followed by Idukki and Wayanad.

Correlation analysis indicated that except promotion of moral value and facilitatory linkage, all 13 dimensions had positive and significant relationship with SSIV. The PCA of the dimensions of social sustainability indicated that the first linear combination of dimensions yielded 60.05 per cent of the total variations and larger magnitude of variation was contributed by food security.

The analysis of ecological sustainability index value of nine panchayats in three districts indicated that average economic sustainability index value in Kerala ranged from 7.7 to 17.76 with highest value in Palakkad followed by Idukki and Wayanad. Correlation study of dimensions of ecological sustainability revealed that all the three

dimensions had significant and positive relationship with the ecological sustainability of tribes. PCA indicated that EP (49.86 %) and RC (29.09 %) contributed higher magnitude of variation followed by IKS (21.04 %).

With regard to sustainable tribal development index value (STDIV), the range of STDIV is only between 8.25 to 22.56 observed in three districts which accounts for more than 65 per cent of tribes in Kerala. Among the three districts, Palakkad had the highest STDIV (22.56) followed by Idukki (18.96) and Wayanad (8.25). The correlation study of the dimensions of STDIV indicated that all dimensions except PMV and DFL had positive and significant relationship with STDIV and 0.01 level of probability.

Regarding the distribution of respondents based on dimensions of ecological sustainability index majority of respondents in Palakkad and Idukki had control over their land resources but in Wayanad, majority had less control over their land resource. In the case of EIG, majority of tribes in all the three districts belonged to low category with regard to MFPs, majority of tribes in Palakkad and Wayanad are having low control over the MFPs, but in Idukki, majority belonged to medium category. In this case of APO, majority of respondent in Palakkad and Idukki belonged to medium category but majority in Wayanad belonged to low category.

Regarding the distribution of respondents on the dimensions of social sustainability, majority of tribes in Palakkad and Idukki belonged to medium category and Wayanad belonged to low category in the case of dimensions – food security, housing security, health and nutritional security, participation, strengthening hamlet system, institution building, infrastructural development and development facilitatory linkage. But in the case of dimensions – protection of cultural heritage, human right security, right to information, majority of respondents belonged to low category in all the three districts. As far as the human resource development, ethno-development and promotion of moral value are

concerned majority of tribes in Palakkad and Wayanad belonged to low category and majority belonged to medium category in Idukki district.

Regarding the distribution of respondents based on the dimensions of ecological sustainability majority of respondents in Palakkad and Idukki belonged to medium category in the case of resource conservation and ecosystem preservation. But in the dimension – indigenous knowledge system majority belonged to medium category in Palakkad and Idukki and low in Wayanad.

Study on distribution of factors influencing sustainable tribal development index revealed that majority of respondents in Palakkad and Idukki belonged to low group in the case of factors land alienation, indebtedness and value orientation. But in the case of socio-economic status, majority of respondents belonged to low group in Palakkad and Wayanad. As far as the level of aspiration is concerned, majority belonged to low group in Wayanad and high group in Palakkad and Idukki. Majority of respondents belonged to low group in Wayanad and high group in Palakkad and Idukki in the case of economic motivation. But majority belonged to low group in Wayanad and Idukki and high group in Palakkad in the case of guidance and supervision. With regard to orientation towards incentives and political interference it could also be observed that majority of respondents belonged to high group category in all the three districts.

Study on correlation of actors influencing sustainable tribal development index with STDIV revealed that all factors except land alienation, indebtedness, orientation towards incentives, external interference and value orientation indicated a positive and significant relationship with STDIV while political interference indicated a non-significant relationship.

With regard to selected tribal development programmes during 1997-2000, it could be observed that major part of the TSP funds have

been set apart for service sector schemes (51.56 %) followed by infrastructure (26.61 %) and productive sector (21.85 %). Regarding the extent of inclusion of dimensions in the selected tribal development programmes revealed that out of 22 dimensions, more number of dimensions have been included in the agricultural development scheme followed by education, drinking water, health, infrastructure and housing.

Regarding the average index value for the selected scheme, agricultural development schemes has got higher index value (10.9) followed by education (9.6), health (8.5), infrastructure development (8.0), drinking water (6.6 %), food support programme (5.7) and housing (5.6).

The results indicated the need for evolving a new strategy of sustainable tribal development by including all possible dimensions of economic, social and ecological sustainability in the development of tribes.